

Chilean steam locomotive lists

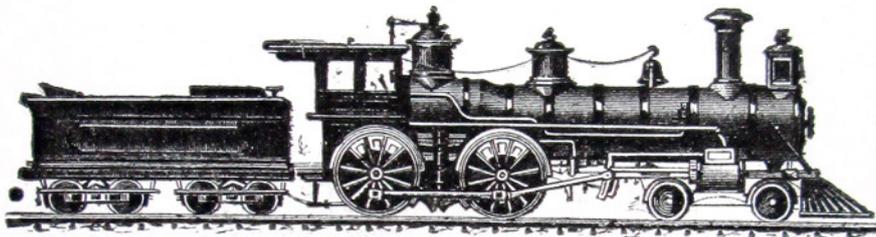
Part 1

Broad gauge locos

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v2.45 June 2021

This file can be found, along with the other four parts in the Chilean series and single files for several other smaller South American countries, at <http://www.railwaysofthefarsouth.co.uk/05x03chileansteamlocos.html>



Introduction

These lists grew from the publication of the book *Railways at the End of the World* (The Araucaria Press, 1 Fellview, Casterton, Cumbria, LA6 2SA, UK. ISBN 978-0-9928622-0-6), back in 2014. During the research undertaken by David Sinclair and I when gathering information for that volume, it had sometimes been frustrating when steam locomotives in southern Chile could not be easily identified.

Once the book had been published there was more time available to try to fill some of the gaps. However, it gradually became obvious that a list of the engines of the Chilean state railways (*EFE*) would have to cover the whole country to be of any use, and thus other sections also expanded, all the way up to Arica.

The foundation was built upon an earlier Chilean list created by Allen Copeland and John Kirchner back in the 1990s. Additional information was originally added bit by bit to their work, until it became clear that a new structure was required. Thus the material was then divided into four parts by gauge, and with an 'Index by builders' later becoming a fifth file. Photographs were added, though these have been kept small, partly to reduce the file sizes and partly to minimise the risk that copyright owners will object. The main purpose of the images is in any case to enable locos spotted in other photographs elsewhere to be identified. When high-resolution versions are likely to be available from museums and archives, this has been explicitly flagged up, to encourage interested readers to purchase what they need from those who care for these historic drawings or photographs.

As news of this work has spread, assistance has come from a large number of other researchers, including in particular Andrew Batory, Derek Hyland, Harold Middleton Nagel, Pablo Moraga Feliu, Martin Murray, Jens Schindler, John Schultz and Chris West. Grateful thanks is due to their selfless willingness to share information and images.

Whilst many of the written sources consulted have been in Spanish, these lists are currently solely available in English. This partly results from my own lack of multi-linguistic confidence, but is also a reflection of the fact that keeping a fast-changing document synchronised in two different tongues is very time-consuming. Nevertheless, quotes from historic documents have usually been left in Spanish and it is to be hoped that in the future a Spanish version of the whole work can be created.

Close examination of these pages is likely to remain strictly a minority interest, whilst even fewer are likely to print out all 1600+ pages! Thus the files have been designed to be read on screen, with hyper-links from the contents page to aid in finding each section. The density of information is likely to discourage browsing on a mobile phone, but gradually the layout is being optimised for display on tablets as well as larger computers.

It will be obvious that this is a work still in progress, with updates being uploaded to the web roughly on a monthly basis at present. Comments, additional items of information or images, and suggestions to improve the layout, would all be very much appreciated, and the author can be contacted at [**martincoombs11@gmail.com**](mailto:martincoombs11@gmail.com)

Introducción

Estas listas tienen su origen en la publicación del libro *Railways at the End of the World* (The Araucaria Press, 1 Felview, Casterton, Cumbria, LA6 2SA, Reino Unido. ISBN 978-0-9928622-0-6), en 2014. En las investigaciones hechas por David Sinclair y yo mismo para información tratando de aquel volumen, ha sido frustrante cuando no se podía identificar fácilmente las máquinas a vapor de Chile austral.

Una vez publicado el libro, teníamos más tiempo disponible para llenar unos espacios vacíos. Pero lentamente sería obvio que una lista de las máquinas de los ferrocarriles estatales de Chile (*EFE*) necesitaba cubrir el país completo para ser de utilidad, y así expandieron otras secciones por toda la distancia hasta Arica.

Este trabajo fue fundado sobre una lista hecha originalmente por Allen Copeland y John Kirchner en los años 1990. Inicialmente se incrementaba poco a poco la información en la lista hasta que fue claro que se necesitaba una estructura nueva. Se dividió el material en cuatro partes por ancho de vía; más tarde, fue hecho una quinta parte tratando de un índice de fabricantes. Se añadieron fotografías, que se mantienen en forma pequeña, en parte para reducir el tamaño de la carpeta y en parte para reducir el riesgo que los propietarios del derecho de autor pondrán objeciones. La intención de las imágenes es identificar las máquinas en otras fotografías. Cuando existen versiones puedan ser disponibles en museos o archivos, esto es notado específicamente para estimular a los lectores a comprar lo que necesitan de los quien cuidan estos dibujos técnicos o fotografías históricos.

Como se ha diseminado la noticia de esta obra, ha llegado ayuda de un gran número de investigadores, incluyendo especialmente Andrew Batory, Derek Hyland, Harold Middleton Nagel, Pablo Moraga Feliú, Martin Murray, Jens Schindler, John Schultz y Chris West. Es necesario expresar mis agradecimientos a su voluntad desinteresada en el compartimento de información e imágenes.

Aunque muchas de las fuentes escritas consultadas usan la lengua española, estas listas están solamente disponibles en inglés. Esta situación es por razón de mi falta de confianza bilingüe, pero también porque mantener sincronizado un documento de rápido cambio en dos lenguas distintas necesita mucho tiempo. Sin embargo, citas de documentos históricos han sido dejados en español. Se espera que en el futuro será posible hacer una versión totalmente en español.

Inspección detallada de estas páginas quedará un interés especialista, ¡aunque menos personas imprimirán todas las 1600+ páginas! Así las carpetas han sido diseñadas para ser leídas en una pantalla, con hipervínculos en la página de contenidos para ayudar descubrir cada sección. La densidad de la información será descorazonador para el curioso usando un celular. Lentamente se mejora el diseño para verlo sobre tabletas como ordenadores más grandes.

Será obvio que esta es una obra todavía en ejecución con adiciones en la web más o menos mensualmente. Comentarios, datos adicionales o imágenes y sugerencias para mejorar la maquetación serán apreciadas. Se puede comunicar con el autor en martincoombs11@gmail.com

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Red text = hyper-links

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Other parts of this work

This is one of a number of PDF files covering the steam locomotives of Chile and several of the smaller South American countries across a wide variety of gauges. The other files can be accessed by clicking on the red hyperlinks listed below. It is hoped that further files will be added in due course.

Part 1	Chilean broad gauge locos
Part 2	Chilean intermediate gauge locos
Part 3	Chilean metre gauge locos
Part 4	Chilean sub-metric gauge locos
Part 5	Chilean locos listed by builders
Part 6	Ecuadorian locomotives
Part 7	Bolivian locomotives
Part 8	Paraguayan locomotives
Part 9	Uruguayan locomotives
Part 10	Venezuelan locomotives
Part 11	Guianan locomotives
Part 12	Colombian locomotives
Part 13	Peruvian standard gauge locomotives
Part 14	Peruvian narrow gauge locomotives

Notes and sources

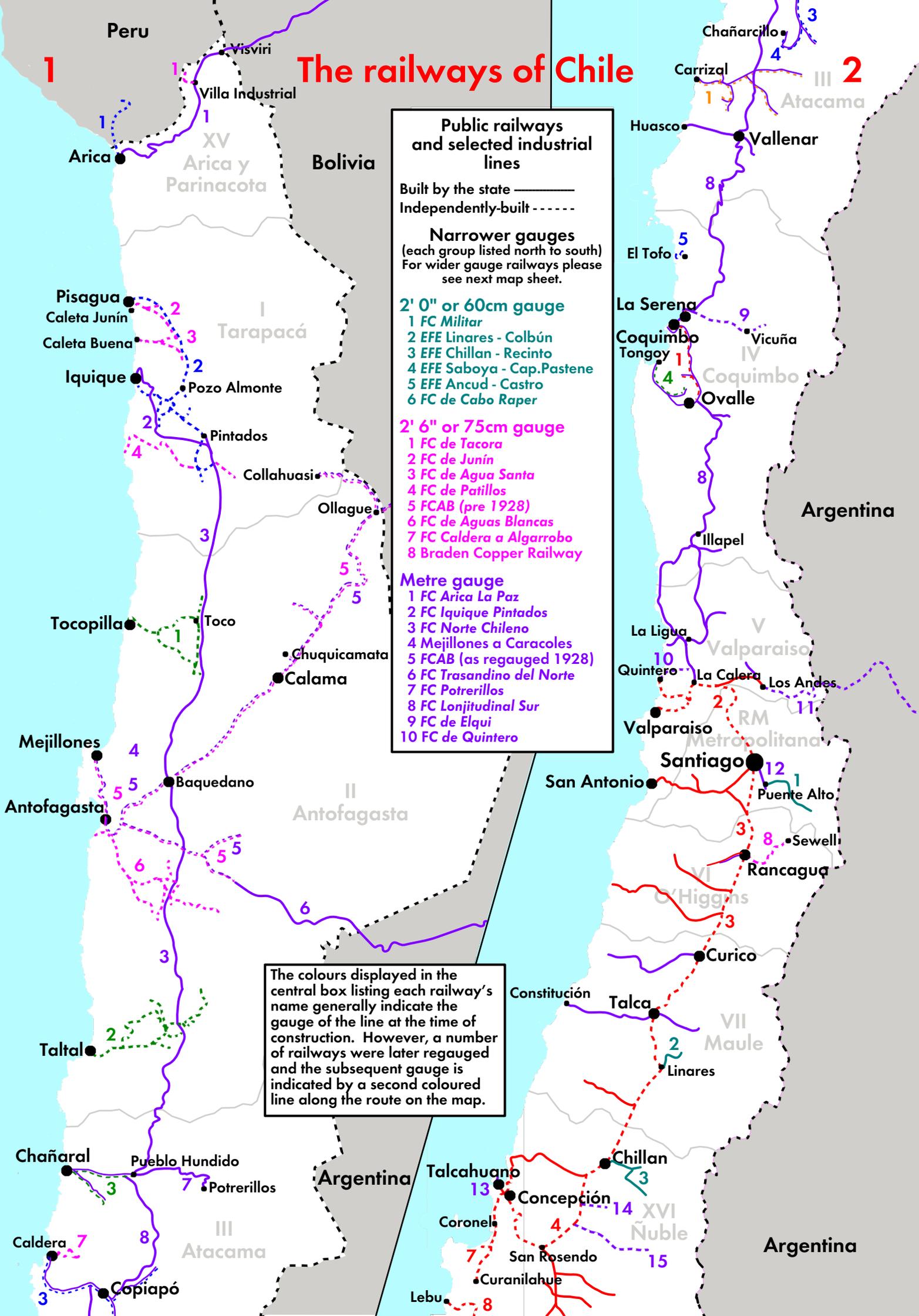
NB Chilean loco lists give the impression of being unbelievably complicated, owing to frequent renumberings. For metre gauge *EFE* locos that reputation is well deserved, but on the broad gauge things were much simpler: new locos were mostly added to the end of the list, with the number series thus building up through the hundreds as time went on. It is true that occasionally gaps were filled or even vacated numbers re-used, but these instances have been clearly signposted below. For this reason the *EFE* part of this list has been set out in date of accession order rather than simply in the order of running number. To aid navigation through the *EFE* list, the years when locos were added have been clearly marked using large grey background numerals as ‘watermarks’ behind the main text.

Sources:

- [1] 1910 exhibition catalogue listing locos built in Chile. <https://archive.org/stream/ferrocarrilesdel00chil#page/n5/mode/2up>
- [2] *Ministerio de Obras Públicas* annual *memorias* (reports), mostly from the *Archivo Nacional* next to the *Biblioteca Nacional* in Santiago.
- [3] *Ministerio de Ferrocarriles* annual *memorias*, mostly available in the *Ministerio de Transportes* library in Santiago, also those from 1929, 1930 and 1931 available online..
- [4] Valdivia railway reports in annual *MdF memorias* up to 1907, and hand-written lists found in *ArNAd* volumes of correspondence MOBR1021, and MOBR1596.
- [5] Correspondence in a number of archive volumes at *ArNAd* in Santiago. Those from the *Ministerio de Obras Públicas* include volumes MOBR2211 and MOBR2569, whilst others are from the *Ministerio de Ferrocarriles* [MFER].
- [6] Article by Pablo Moraga Feliu in *En Tren*, No. 10 September 2002.
- [7] Ian Thomson’s paper, *El debate entre las bondades de la tecnología ‘Americana’ e ‘Inglesa’ en los Ferrocarriles Estatales Chilenos de la decada de 1870*. http://www.scielo.cl/scielo.php?script=sci_arttext&pid=S0717-71942002003500013
- [7a] Ian Thomson, ‘*US & UK manufacturers battle it out in 19th C. Chile*’, *Locomotives International* issue 90, June-July 2014
- [8] Pablo Moraga’s *Tiempo de Trenes* book.
- [9] Full list of *EFE* loco and stock purchases from 1902-20 in *EFE memoria* 1919.
- [10] Photos by Tommy Farr in 1974 at The Transport Library website.
- [11] Pablo Moraga’s own list of *EFE* locos.
- [12] Article in *Anales del Instituto de Ingenieros de Chile* 1895, issues 49 and 50.
- [13] Articles in *Anales del Instituto de Ingenieros de Chile*, 1909 issue 4 to 1910 issue 8.
- [14] Article in *Anales del Instituto de Ingenieros de Chile* 1928, issue 7.
- [15] Report on the *Reorganizacion de los ferrocarriles del Provincia de Coquimbo*, Valparaiso 1894.
- [16] *Red Norte*, Ian Thomson, 1997, *Locomotives International*, also [33].
- [17] 1928 report on *FC Lebu a Los Sauces* in *Anales del Instituto de Ingenieros de Chile*.
- [18] Bob Whetham’s book on *Railways of Peru*, vol. 2.
- [19] *EFE* table of broad gauge locos classified by wheel arrangement, October 1902.
- [20] List from Overseas Railway Study group tour, May 1972.
- [21] *World Steam* newsletter loco list in 1972.
- [22] *The Railways of Chile*, Wilfred Simms, five volumes, 1999-2000.
- [23] S. Marin Vicuña, *Los Ferrocarriles de Chile*, various editions. 4th edition 1916.
- [24] Post-1908 *EFE* loco diagram book, in SLS library.
- [25] lists supposedly by Wilfred Beckerlegge in SLS library.
- [26] Reg Carter’s list in SLS library file L8655.
- [27] *The Locomotives of the Railway between Santiago and Valparaiso*, Ian Thomson.
- [28] *DOP memoria anual* 1888

- [29] Various *Ministerio del Interior memorias* from the 1860s and 1870s, in the *Archivo Nacional Historico* at Santa Lucia in Santiago. When referred to below, these are referenced as MINTxxx.
- [30] Withdrawal dates from hand-written notes on appropriate pages of *EFE* diagram books, now held by Pablo Moraga and in P. C. Dewhurst collection at the NRM in York.
- [31] Comment from Adán Reinaldo Garcés Gallardo on Facebook in May 2016.
- [32] David Ibbotson list of locos seen 1971-2, in SLS library file L8841.
- [33]
- [34] *EFE memoria anual 1922*, in library of *Ministerio de Transportes*.
- [35] Photo on Restoration and Archiving Trust website at <http://gwrarchive.org/index.php>
- [36] *Railways of South America, Part III Chile*, US Department of Commerce 1930. Data probably from around 1928.
- [37] *Clasificacion y distribucion de las locomotoras a vapor Red Sur, trocha 1.68* in *EFE* working timetable 48th edition summer 1942.
- [38] Summary list of locos ‘ingresos’ or ‘bajos’ during 1957, supplied by PMF.
- [39] <http://www.steamlocomotive.com/>
- [40] Charles King in *Railway Magazine* Feb. 1908.
- [41] *Los Ferrocarriles del Estado*, Samuel Nunez Oleachea, 1910, Santiago.
- [42] *Actas de las Sesiones del Consejo Administrativo de los Ferrocarriles del Estado*, (those between May 1915 and December 1916, also years 1918 and 1920, so far seen via Hathi Trust website). Santiago.
- [43] *Boletin del Ministerio de Industria y Obras Publicas*, Jan-Jun 1888.
- [44] *La vida en Penco en torno al ferrocarril, Rieles con historias y recuerdos*. By Jaime Robles Rivera. <http://penco-chile.blogspot.co.uk/2017/06/hechos-y-anecdotas-del-pasado-servicio.html>
- [45] *Proposed not Produced for Bolivia & Chile*, Ian Thomson Newman, *Locomotives International* no. 111, 2017.
- [46] Report *Red Central Norte 2*, in *Anales del Insituto Injeniero de Chile* in 1919. by Javier Gandarillas M.
- [47] The US Bureau of Foreign & Domestic Commerce *World Survey of Foreign Railways, part 1*, published in 1936.
- [48] ‘Mountains’ in Chile, Ian Thomson, in *Locomotives International* issue 21, 1993.
- [49] *Adiós to the San Bernardo locomotive works*, Ian Thomson, in *Locomotives International* issues 32, ????
- [50] *Chilean Locomotive Mysteries: Some solved, some not*, Ian Thomson, *Locomotives International* issue 53, 2000.
- [51] *Early locomotives of the FC de Coquimbo*, Ian Thomson, *Locomotives International* issue 49, 1999.
- [52] Letter by A. E. ‘Dusty’ Durrant in *Locomotives International* issue 43, 1998.
- [53] Letter by Arturo Squire to P. C. Dewhurst dated 25th July 1925. In P. C. Dewhurst archive at the National Railway Museum in York, box 41.
- [54] *Intra-South American trade in used steam locomotives and its raisons d’etre*, Ian Thomson Newman, in *Locomotives International* issue 119, 2019.
- [55] *Los Ferrocarriles del Estado*, Samuel Núñez Olaechea, Santiago, 1910.
- [56] *Estudio de la zona carbonifera de Chile*, in *Boletin de la Sociedad Nacional de la Minería*, Santiago : La Sociedad, 1883-1918. 34 volúmenes, año 24, volumen 19, número 127, (31 enero 1907), páginas 388-406, 458-490
- [57] Loco list by David Ibbotson of Dorridge Travel Services, 1972.
- [58] *Boletin mensual del EFE*, 1915. Nos.37-40.
- [59] *The coal-fields and collieries of the Republic of Chile*, by Archibald Russell, in *Transactions of the Institution of Mining Engineers*, Newcastle upon Tyne, v.38 (1909-10) p29-82.
- [60] Chapters in *La industria del cobre en las provincias de Atacama y Coquimbo y los depósitos carboníferos de Lota y Coronel / Francisco Aracena*. Valparaíso : Imprenta del Nuevo Mercurio, 1884. 372 páginas.
- [61] *Los Ferrocarriles de Chile*, Velásquez Jiménez, *artículo publicado en los Anales dela Sociedad Cientifica Argentina, tomos XLIX y L*.
- [62] *Facts and Opinions regarding the economical construction and working of Railways of Narrow Gauge with Steep gradients and Sharp Curves...*, T. W. Armstrong, 1870, PWD of Central Provinces. <https://babel.hathitrust.org/cgi/pt?id=nyp.33433007752011&view=1up&seq=7> Pages 149-184 (digital file pages) by E. Woods and W. Lloyd are

The railways of Chile



Public railways and selected industrial lines

Built by the state —————
Independently-built - - - - -

Narrower gauges
(each group listed north to south)
For wider gauge railways please see next map sheet.

2' 0" or 60cm gauge

- 1 FC Militar
- 2 EFE Linares - Colbún
- 3 EFE Chillan - Recinto
- 4 EFE Saboya - Cap.Pastene
- 5 EFE Ancud - Castro
- 6 FC de Cabo Raper

2' 6" or 75cm gauge

- 1 FC de Tacora
- 2 FC de Junín
- 3 FC de Agua Santa
- 4 FC de Patillos
- 5 FCAB (pre 1928)
- 6 FC de Aguas Blancas
- 7 FC Caldera a Algarrobo
- 8 Braden Copper Railway

Metre gauge

- 1 FC Arica La Paz
- 2 FC Iquique Pintados
- 3 FC Norte Chileno
- 4 Mejillones a Caracoles
- 5 FCAB (as regauged 1928)
- 6 FC Trasandino del Norte
- 7 FC Potrerillos
- 8 FC Longitudinal Sur
- 9 FC de Elqui
- 10 FC de Quintero

The colours displayed in the central box listing each railway's name generally indicate the gauge of the line at the time of construction. However, a number of railways were later regauged and the subsequent gauge is indicated by a second coloured line along the route on the map.

4

The railways of Chile

3

List continued from previous map

Wider gauges
(each group listed north to south)
For narrower gauge railways please see previous map sheet.

Metre gauge (continued)

- 11 FC Trasandino
- 12 FC Llano de Maipo
- 13 Apost. Naval de Talcahuano
- 14 FC Gral. Cruz a Cartago
- 15 FC Trasandino por Antuco
- 16 FC Trasandino por S. Martín

3' 6" gauge

- 1 FC Tocopilla - Toco
- 2 FC de Taltal
- 3 FC de Chañaral
- 4 FC de Tongoy
- 5 Soc. Carb. de Magallanes

4' 2" or 4' 6" gauge

- 1 FC de Carrizal
- 2 Lota coal mines

4' 8" gauge

- 1 FC Arica Tacna
- 2 Nitrate Railways
- 3 FC de Copiapó
- 4 Copiapó Extension Railway
- 5 FC Cruz Grande al Tofo

5' 6" gauge

- 1 FC de Coquimbo
- 2 FC Santiago Valparaiso
- 3 FC del Sur
- 4 FCCCIT
- 5 EFE Red Sur
- 6 FC Freire a Tolén
- 7 FC Arauco
- 8 FC Lebu á Los Sauces

Cabo Raper lighthouse

XI Aysén

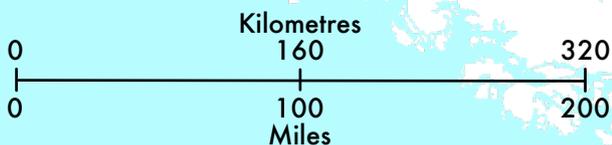
Argentina

Puerto Natales

XII Magallanes

5 Punta Arenas

Argentina



on Chile, with particularly the Tongoy, Carrizal, Copiapo Extension and *FCSV* railways being mentioned.

[63] *Graces' Guide* article on the distinguished early railway and locomotive engineer Edward Woods. https://www.gracesguide.co.uk/Edward_Woods

Abbreviations used:

FCSV = *Compañía del FC de Santiago a Valparaíso*

FCCA = *FC Curicó Angol*

EFE = *Empresa de los Ferrocarriles del Estado*.

w/n = works number.

cyls. = cylinder bore and stroke.

MSB = *Maestranza San Bernardo*.

FCCCiT = *FC Chillán, Concepción i Talcahuano*.

FC = *ferrocarril*.

BLW = Baldwin Locomotive Works.

d/w = driving wheel diameter.

DOP = *Dirección de Obras Públicas*

SOP = *Sindicato de Obras Públicas*

Dimensions

Imperial unit driving wheel and cylinder dimensions, ie. in inches, have been added if it seems likely that they were originally created in that system.

Rogers builders numbers

Note that no list has ever been found showing builders' numbers for Rogers locomotives constructed between 1856 and 1872. Numbers from 688 to 2152 were allocated by Chas Fisher from a sales and shipment list but are merely guesses. These numbers are commonly quoted but have no historical authority. They are shown in Connelly's Rogers list in brackets and I have done the same here.

Photographs

Photos have been added here solely to aid in the identification of locos seen in other images elsewhere. They have been found from many different sources, and may still be in copyright. For those reasons, and to keep the file sizes down, they are of low resolution, the majority being only 600 pixels across. The names of photographers will be added as time permits. As these documents are likely to have a very limited readership and are not being produced commercially, it is hoped that copyright holders will understand and permit their presence here. If not, please contact the author and they can be removed.

Text in red, apart from the hyper-links at the beginning, requires further thought to reconcile inconsistencies.

1.1.1 La Compañía del FC de Santiago a Valparaiso known alternatively in the 1870s as the *Ferrocarril del Norte*

1849-1884

Background

The company was constituted in 1849, whilst the line opened from Valparaiso to El Salto in 1855, to Quillota in 1857, and to Santiago in 1863.

Original 0-4-2 loco dimensions

The dimensions listed on the next couple of pages for individual engines vary widely and it is difficult to see any pattern. This is a result of frequent rebuilds, and the swopping of wheelsets depending upon the duties being undertaken by any individual loco. A clearer picture is given by a table published in 1863 [62]: [Lines of text showing differences between passenger and goods locos are in blue.](#)

“The dimensions of the engines now in use are as follows:—

	Passenger Engines.	Goods Engines.
Length of fire bars	3 ft. 6 ins.	3 ft. 6 ins.
Width of ditto	3 ft. 9 ins.	3 ft. 9 ins.
Surface of ditto	13.12 sq. ft.	13.12 sq. ft.
Number of tubes	161	193
Length of ditto	11 ft. 6 ins.	11 ft. 6 ins.
Inside diameter of ditto	1¾ ins.	1¾ ins.
Fire-surface of ditto	848 sq. ft.	1,016 sq. ft.
Heating surface of fire-box	74 sq. ft.	78 sq. ft.
Total fire-surface	922	1,094 sq. ft.
Inside diameter of boiler	4 ft. 2 ins.	4 ft. 2 ins.
Quantity of water in ditto	730 gals.	730 gals.
Pressure of steam in boiler	110 lbs.	120 lbs.per sq. in.
Steam cut off in cylinder	17, 15, 13, 10½, 8¼, 6, 3, ins.	17, 15, 13, 10½, 8¼, 6, 3, ins.
Diameter of cylinder	15 ins.	16½ ins.
Length of ditto	26 ins.	28 ins.
Stroke of piston	22 ins.	24 ins.
Diameters of leading and driving wheels	5 ft.	4 ft.6 ins.
Ditto of trailing ditto	3 ft.	3 ft.
Gauge of rails	5 ft. 6 ins.	5 ft. 6 ins.
Centres of wheels, leading to driving	8 ft.	8 ft.
Ditto, driving to trailing	5 ft. 6 ins.	5 ft. 6 ins.
Extreme centres	13 ft. 6 ins.	13 ft. 6 ins.
Width of tires	5 ins.	5 ins.
Incline of tires	1 in 6	1 in 6
Weight on leading wheels	20,065 lbs.	24,000 lbs.
Ditto on driving ditto	24,000 lbs.	26,000 lbs.
Ditto on trailing ditto	9,016 lbs.	9,016 lbs.
Ditto, Engine empty	53,081 lbs.	59,016 lbs.
Ditto, tender ditto	18,600 lbs.	18,600 lbs.
Water in tender	1,000 gals.	1,000 gals.
Fuel in tender	2,000 lbs.	2,000 lbs.”

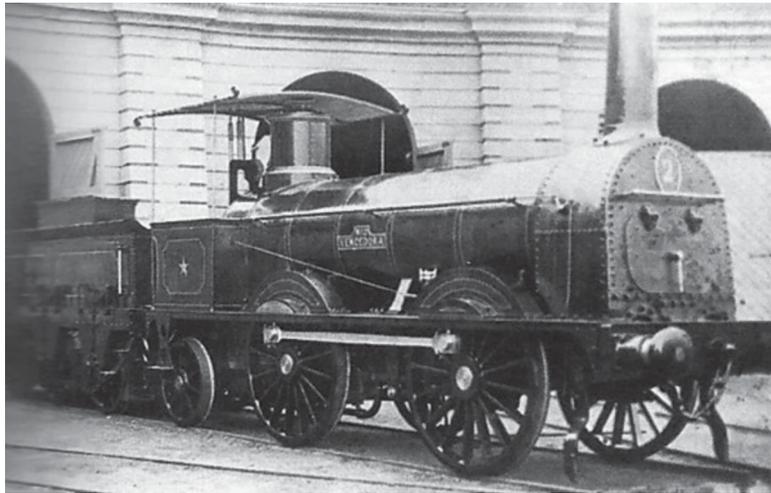
It will be noted that the frames were probably identical, with the major differences being in the boiler internals and pressure, the cylinder bore and stroke, the driving wheel sizes, and the consequent weights.

**FCSV class when built: 2nd. This class listed as passenger locos in 1866
0-4-2 d/w, and cyls. various see notes for each loco, built by Hawthorn of Leith in 1855**

Dimensions were taken from an *EFE* diagram book, and are not necessarily original.

1 ‘EMPRESA’	w/n ?	d/w 1473mm 58", cyls. 419x609mm 16½"x24". The driver of this loco during the construction period leading up the completion into Santiago had been Sr. Carlos Peale [41, p50]. Received new boiler 1869-70 and rebuilt as new. New axles and tyres of steel fitted during that year. Rebuilt as 4-4-0 in 1879 at Valparaiso workshops [6]
2 ‘VENCEDORA’	w/n ?	d/w 1524mm 60", cyls. 381x559mm 15"x22". Considerable attention received 1867. Received new boiler 1870 and rebuilt as new. New bogie axles and tyres of steel fitted during that year. Wheels turned 1876. 1879 wheels turned, bearings renewed and some tubes replaced.
3 ‘OBSTÁCULOS’	w/n ?	d/w 1524mm 60", cyls. 381x559mm 15"x22". Considerable attention received 1867. New boiler received from Europe in 1870. Rebuilt as new in 1873-4, with new boiler barrel and cylinders, also new tender tank and axles with new steel tyres. Then used on express services. 1879 wheels turned, bearings renewed and some tubes replaced. 1882 report says retubed and some new stays; also work on cylinder and valves [MOBR2]. General repairs 1883, and wheels turned. <i>Number re-used in 1914 for a tipo 57 [6].</i>
4 ‘ADELANTE’	w/n ?	d/w 1524mm 60", cyls. 381x609mm 15"x24", New boiler received from Europe in 1870. Rebuilt as 4-4-0 at Valparaiso workshops by 1874 [7a]. Wheels turned 1876 and other repairs as necessary.
5 ‘RECOMPENSA’	w/n ?	TK list for Hawthorns of Leith suggests d/w 1524mm 60", cyls. 381x609mm 15"x24", Seems to have been OoS during 2nd half of 1865, and reported in 1867 as having received a heavy overhaul. New boiler received from Europe in 1870. Heavy overhaul in 1875, when frame lengthened, new larger boiler fitted, also new cylinders, new bogie fitted at front and former front driving wheels moved to rear making it now a 4-4-0. Tender also received new axles and tyres and a new larger tank. Wheels turned 1876. Some front-end damage received owing to a derailment at Montenegro in August 1877 but only out of action for a week. 1879 wheels turned, bearings renewed and some tubes replaced. Wheels subsequently replaced. Bogie replaced also that year. 1882 report says all tubes expanded and some other boiler work [MOBR2]. Retubed 1883 and wheels turned.
6 ‘PORVENIR’	w/n ?	d/w 1524mm 60", cyls. 419x609mm 16½"x24". The driver of this loco during the construction period leading up to the completion into Santiago had been Sr. Tomás Morris [41, p50]. Received new boiler 1869-70 and heavy overhaul. New bogie axles and tyres of steel fitted during 18?? Major overhaul 1874 [MOBR2]. 1878-9 four boiler plates replaced. Firebox patched and tubes renewed in late 1879, various other repairs and then loco employed on Valparaiso

port branch and assembling trains. Rebuilt as 0-4-4T, in 1883? [11].



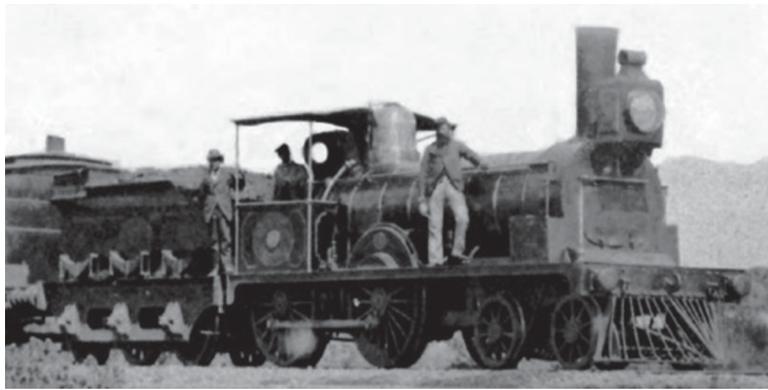
No. 2 'VENCEDORA', probably as built, with a dome over the firebox, sloping smokebox front, no obvious sandboxes and a smokebox number-plate.



An intermediate condition, with a domed boiler, sandboxes and large oil lamp, but still with a capped chimney.



No. 2 'VENCEDORA' now with a flared stovepipe chimney and an air pump in front of the cab. The wheels are larger than those in the photo above (perhaps by 6") as evidenced by the greater distance of the footplate from the trailing wheel flange, the slightly deeper buffer beam, and the relative heights of the loco and tender running plates. The sandboxes are also larger than those seen above.



Whilst this is not a good image, it does seem to show one of the Hawthorn 0-4-2s as rebuilt to 4-4-0 configuration.



Number 4, rather later it would appear, with a rather more substantial cab and a boiler with dome much further forward.

FCSV class when built: 1st. This class listed as goods locos in 1866.

0-4-2 d/w and cyls. various, see notes for each loco, built by Hawthorn of Leith in 1856

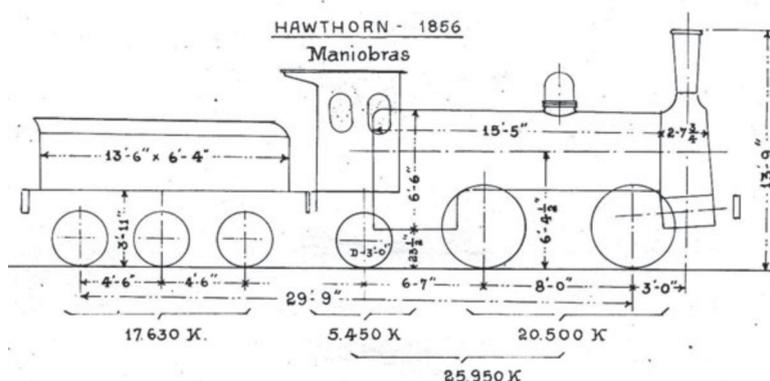
Dimensions were taken from *EFE* diagram book, and are not necessarily original. Annotation on diagram sheet notes that cylinders were replaced by those of 18" diameter.

7 'VALPARAISO'	w/n ?	d/w 1372mm 54", cyls. 419x609mm 16½"x24". Considerable attention received 1867. Received new boiler 1870. 1878-9 new firebox and general check-over. Rebuilt as 0-4-4T, in 1883? [11] or possibly again as an 0-4-2 [24].
8 'QUILLOTA'	w/n ?	d/w 1676mm 66", cyls. 457x609mm 18"x24". Received new boiler 1869-70. Rebuilt as new during that year, including new bogie axles and tyres of steel. Major overhaul 1874 [MOBR2]. Wheels turned 1876. Rebuilt as 4-4-0 in 1879 at Valparaiso workshops [11].
9 'ACONCAGUA'	w/n ?	d/w 1524mm 60", cyls. 16½"x24", New tubes fitted in 1867 and boiler strengthened. New boiler received from Europe in 1870. Rebuilt as a 4-4-0 in 1877 at Valparaiso workshops, with new forged frames, a new Hawthorns boiler, new cylinders and renovated motion on new wheels and axles. Also a new cab, a reinforced tender frame with a new larger tank and new axles. It seems the loco was fitted with 54" d/w at that time but in 1879 these were replaced by 60" d/w,

10 'SANTIAGO'

w/n ?

whereupon it took its place on express trains from June of that year. d/w 1372mm 54", cyls. 419x609mm 16½"x24". Can't be found in Brian Rumary's Hawthorn list, but this is incomplete. (Some say an 0-4-0, but the 1896 diagram book shows this as an 0-4-2) Received new boiler 1869-70 and heavy overhaul. New bogie axles and tyres of steel fitted during that year. Heavy overhaul in 1876, with new firebox and wheels turned, also heavy repairs to tender tank. Annotation on diagram sheet, possibly by AS, states that no. **10** made a record trip from Santiago to Valparaiso with the Peruvian Minister on board on the outbreak of war in 1879, and that this timing of 2 hours 40 minutes was still a record. These locos were apparently used on expresses from Valparaiso to Santiago.



Sketch is from post-1908 *EFE* diagram book, in the SLS library file LD1896.

Passenger loco used as a stationary engine for several years

The construction of the 1600 foot San Pedro tunnel took several years, not least because of subsidence problems. In order that traffic to Quillota station could commence without waiting for the tunnel's completion, inclines on gradients of 1 in 13 and 1 in 15 were built to the top 150 feet above the tunnel and one of the passenger locos listed above had its wheels removed and was located up there as a stationary haulage engine for a period of four years. This was probably from 1853 to 1857 or thereabouts. The precise identity of the locomotive that was used is unknown.

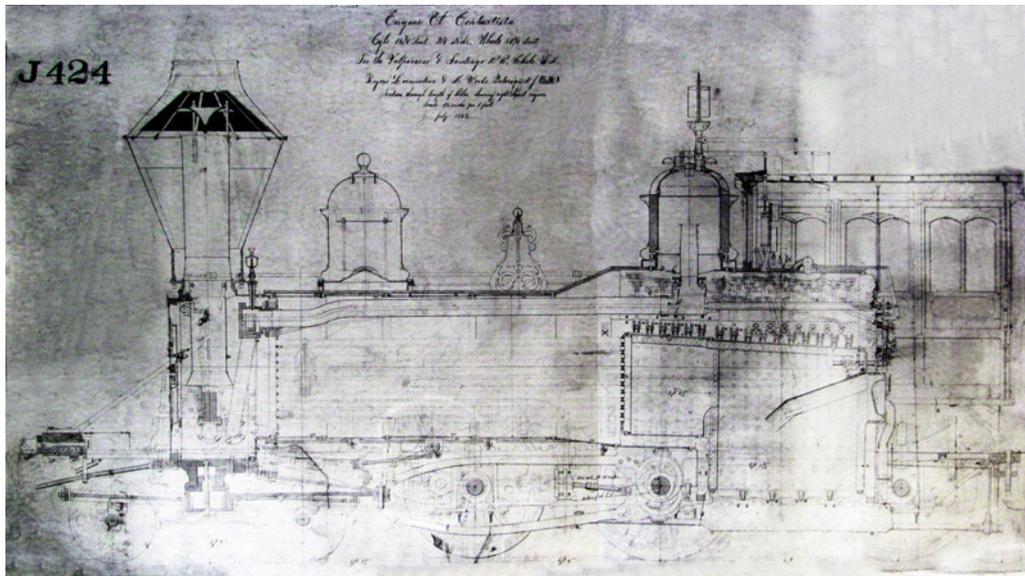
4-6-0 d/w 1270mm 50¾", cyls. 432x609mm 16 7/8"x24", built by Rogers in 1862

Order no. J-424. 1875 *FCS memoria* says d/w 51". The Rogers GA blueprint (a photostat is in the P. C. Dewhurst collection) shows this loco to have had a wagontop boiler with a dome over the firebox, then a bell, followed by a typical Rogers sand-dome immediately behind a spark-arresting chimney. The wooden cab had three pairs of side windows. One rumour suggests that this was built for a US railroad, but ended up in Chile. No running number has been found for this engine on the *FCSV*.

? 'EI CONTRATISTA'

w/n 1030

[7] says this was acquired first by Meiggs for the construction of the *FCSV*, and then sold to the *FCS* in 1865 supposedly because it had proved unsuitable for long-term use west of Santiago. Certainly Rogers blueprints for the loco say it was for the 'Valparaiso & Santiago R. R.' This was the loco which led the first official train into Santiago on 4th July 1863. The driver of this loco during the construction period had been Sr. Clarck Hollister [41, p50].



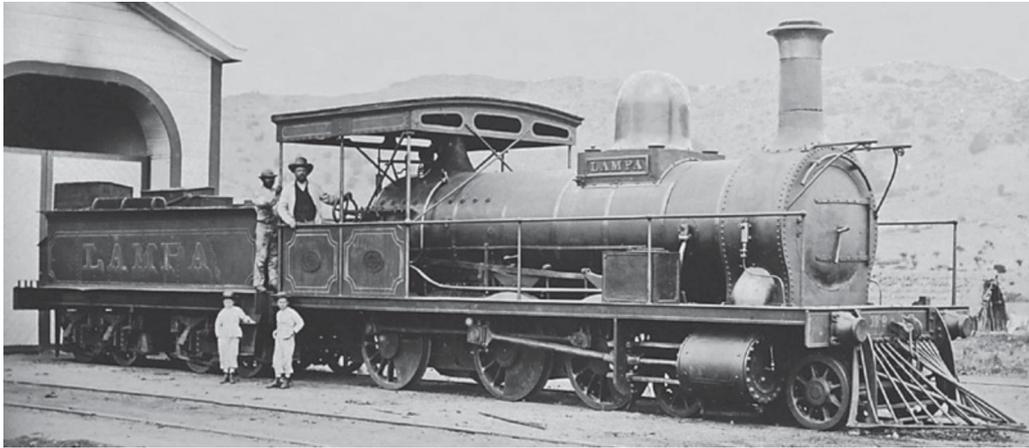
Whilst this inverted-tone photostat of a Rogers blueprint, from the P. C. Dewhurst collection in the NRM in York, shows up very poorly here, it does enable one to see the spark-arresting stack, the large wooden cab, and the wagon-top boiler.

FCSV class when built: 3rd. This class listed as goods locos in 1866.

4-6-0 d/w 1220mm 48", cyls. 470x609mm 18½" x24", built by Slaughter Gruning in 1863

Built for the El Tabón incline section. Supplied with Sturrock steam tenders, moved in due course to other engines and later used to create locos nos. **58-59**, see below. J. B. Rowley's Avonside list suggests these may have been SG / Avonside 455-457 of 1862. New steam-pipe arrangements were fitted to all three locos in 1867 owing to losses of steam from original design. All three were doing good service in 1868 but wheels had been replaced, fireboxes reinforced, and stronger axleboxes fitted to both locos and tenders. These modifications must have been made very quickly after the locos' arrival. J. B. Rowley suggests these 3rd and 4th class locos were Slaughter Gruning 526-531 [LI issue 42, 1998]. Some sources state that these engines had originally been built for India, but whilst details such as the cab do have an Indian look about them no evidence has been seen to support this suggestion.

11 'COLINA'	w/n 455?	1869 working well. Heavy overhaul 1878-9, including new boiler sourced from Europe, and wheels turned. Received considerable attention during 1887, including new bogie wheels at great expense; however as it then dealt with all the traffic for Llai-Llai during the following year this was considered to have been money well spent.
12 'LAMPA'	w/n 456?	Cylinders reinforced 1867. 1869 working well. Major overhaul 1874 [MOBR2]. Heavy overhaul in 1875, with new firebox wrapper(?) and wheels turned. Wheels turned again in 1879.
13 'TIL-TIL'	w/n 457?	New cylinders fitted by 1867. 1869 working well. Under reconstruction during 1877-9. Wheels turned 1883.



FCSV no. 12 'LAMPA', Note bogie tender, possibly borrowed from other locos after Sturrock steam tenders were dispensed with. Its source is unknown but most UK-sourced locos will have had 6-wheeled tenders.

Early technical improvements

W. Lloyd, writing in 1863 [62], describes a number of improvements that had been made to the *FCSV*'s original steam locos even by that early date. These included:

Coke fuel replaced by local Chilean coal. This required the installation of brick arches, together with hollow stays to introduce air at the front of the fireboxes. A removeable deflector plate was fitted at the firedoor; firebars were lowered by 5 inches and refitted closer together; and an annular steam jet was installed in the chimney.

Driving wheel to rail interface. Hot water jets aimed at the flanges of the front pair of driving wheels eased the loco's passage around sharp curves, as did steepening the conicity of the wheel-treads from 1 in 7 to 1 in 6.

Brake block cooling. A problem descending steep grades, such as on the El Tabón Pass, was that tender brake blocks – presumably of wood – tended to catch fire. This was cured by allowing water to drip onto the blocks from the tender tank.

Reduction in rolling resistance of trains. Wetting the outside rail of a curve after the loco had passed reduced the rolling resistance of the train. This too was arranged using water from the tender tank.

***FCSV* class when built: 4th. This class listed as goods locos in 1866.**

4-4-0 d/w 1422mm 56", cyls. 419x609mm 16½" x24", built by Slaughter Gruning in 1863

J. B. Rowley's Avonside list suggests these may have been SG / Avonside 525-527 of 1863-4. All three reported in 1867 to have received radial front bogies to remedy defects in the original design which may have been a 2-4-0, also the tender wheel tyres were replaced by new Krupp iron tyres at the same time, whilst the tender springing had been changed to remedy the rapid damage to the frames. J. B. Rowley suggests these 3rd and 4th class locos were Slaughter Gruning 526-531 [LI issue 42, 1998]

14 'MAPOCHO'

w/n ?

Outside cylinders. The driver of this loco during the construction period leading up to the completion into Santiago had been Sr. Guillermo Cook [41, p50]. Retubed 1869. Major overhaul 1875, with new firebox, tubes and cylinders, also revised cab arrangement. Major overhaul 1878, with boiler worked on and all new tubes, also wheels turned and new axleboxes. General repairs 1879, with new tubes and other boiler work, wheels turned, cylinders bored, bearings renewed. In early 1883 a loco 'MAPOCHO', which may have been this engine or that belonging to the *FCS*, was reported on loan to the *FCCCiT* and in service on goods trains between Concepción and Talcahuano. That engine spent most of 1884 at Talcahuano, being very little used; total kilometrage to date for

15 'RENCA'	w/n ?	<i>FCCCiT</i> 19,150. Retubed 1869. Heavy overhaul in 1873, with new firebox and tubes, frames reinforced and tender rebuilt, subsequently in use on Santiago goods trains. 1879 patches fitted to firebox.
16 'CHACABUCO'	w/n ?	Retubed 1869. 1882-3 had been on loan to <i>FCCCiT</i> but was eventually returned as was not being used there. 1884 total kilometreage on <i>FCCCiT</i> 2,875.

FCSV class when built: 5th

0-4-2 d/w 66" ? but see notes for each loco, cyls. 18"x24", probably built by Slaughter Gruning/ Avonside in 1863 (first three) and 1866 (last three).

J. B. Rowley's Avonside list suggests these may have been SG / Avonside 528-530 of 1864, and 617-619 of 1865, but works numbers 617-618 have also been credited to *FC de Coquimbo* locos in section 1.5.1. However, a photo taken on the turntable at Barón shows **19 'SAN RAMÓN'** as a 4-4-0 bearing an unnumbered worksplate inscribed Hawthorn & Co. Leith, MDCCCLXVII, ie. 1867. The plate, being unnumbered, might merely indicate that kits of parts for the rebuilds had been supplied by Hawthorn, rather than the original loco being by them. J. B. Rowley suggests that locos **17-19** were in the Slaughter Gruning number series between 575 and 586, whilst **20-22** were probably Slaughter Gruning 617-619 [LI issue 42, 1998]

17 'EI TABÓN'	w/n ?	d/w 1524mm 60". Rebuilt as 4-4-0 at Valp. Shops by 1874 [7a]. In late 1877 a new firebox 12" longer was fitted on a lengthened frame, with a new cab. 1879 wheels turned and a general bottom end overhaul.
18 'BATUCO'	w/n ?	d/w 1676mm 66". Wheels turned 1876. Also rebuilt as a 4-4-0 at some point. In 1878 a new firebox 12" longer was fitted on a lengthened frame, with a new cab. 1879 the front bogie was replaced.
19 'SAN RAMÓN'	w/n ?	d/w 1524mm 60". Heavy overhaul in 1873 with new firebox 12" longer, and rebuilt as a 4-4-0. Subsequently employed on express trains to Santiago, and reported in 1875 as having covered 126,000 km in two years. At that point wheels turned, new tender axleboxes fitted and various other repairs. A photograph at Barón shows the motto 'Ready, Ay Ready' on the splasher and a seemingly unnumbered Hawthorns of Leith worksplate on the cabside.
20 'SAN PEDRO'	w/n ?	d/w 1422mm 56", cyls. 457x609mm. Fitted with smaller driving wheels during 1870, and boiler overhauled that year. Heavy overhaul received in 1875, with a new firebox 12" longer. Previous Sturrock powered tender removed for use in the construction of a new shunting engine for use in Santiago station (similar to one built three years previously), and a replacement tender constructed. Loco then put into service on the Los Andes branch, but in early 1876 it hit a large rock. The frame was bent as were wheels and axles with the cow-catcher destroyed. Temporary repairs enabled the loco to be moved to Valparaiso where much was replaced before the engine returned to service on the branch. 1879 wheels turned, and firebox patched.
21 'LEBU'	w/n ?	d/w 1676mm 66", cyls. 419x609mm. Boiler overhauled during 1870. Rebuilt as 4-4-0 at Valparaiso workshops by 1874 [7a]. New steel tyres fitted 1876, after period on express trains.

22 'PASO HONDO'

w/n ?

d/w 1422mm 56", cyls. 457x609mm. Fitted with smaller driving wheels during 1870, and boiler overhauled that year. Major overhaul in 1875, with new 12" longer firebox and frames adjusted to suit. Tender transferred to no. 36 and new tender constructed. Loco subsequently in service on Los Andes branch. 1878 boiler plates replaced and all tubes renewed.



19 'SAN RAMON' on the turntable at Barón at an unknown date and, below, the Hawthorn of Leith worksplate on the cabside.



Locos borrowed in 1867?

[27] suggests that the *FCSV* borrowed locos from the *FCS* around 1867 to remedy a shortage of motive power after the full opening right through to Santiago. eg. three engines borrowed that year.

4-4-0 d/w 60"? but see each loco, cyls. 419x609mm 16½" x24", built by Hawthorn of Leith in 1868.

Ten out of twelve received and erected by end of 1869. All may have had d/w 60" originally, but re-wheeling with smaller wheels was common once a loco started to get more worn.

23 'LLAILLAI'

w/n 386

d/w 1524mm 60". Builders' photo shows loco and tender seemingly in colours of the Chilean flag and with a star on each sandbox.

Reported as being of very good quality on arrival. Major overhaul 1874 [MOBR2]. Overhaul 1875, including 22 new tubes, wheels turned and new axleboxes. In late 1877 the boiler was rebuilt with a new firebox, the wheels were turned and new axleboxes fitted. 1879 wheels turned and bogie replaced. In 1882-3 several new boiler plates, a new copper firebox and all new tubes, also bogie and tender overhauled [MOBR2], wheels also turned.

24 'MAQUIS' or 'LOS MAQUIS' w/n 400

d/w 1372mm 54". New tube-plate fitted 1873, and retubed.

Extensive repairs 1875. Wheels turned 1876. In late 1877 a the boiler was rebuilt with a new firebox and a new set of tubes, the wheels were turned and new axleboxes fitted. Wheels turned again 1879. 1882 reports says 5' 0" driving wheels replaced by those of 4' 6" as loco is to be used for goods trains. All bearings renewed at same time [MOBR2]. 1883 report repeats news that wheel size was

		reduced from 60" to 54" for goods work, and says heavy repairs to tender.
25 'VICHICULEN'	w/n 388	d/w 1676mm 66". In 1874 given a new Low Moor iron firebox which lasted only 19 months, so loco fitted with a replacement boiler purchased for such needs, and original boiler re-fitted with a new copper firebox ready for use on any loco needing it. One of the other <i>MoI memorias</i> suggests a general overhaul in 1875. In April 1876 it derailed and overturned down an embankment near Ocoa, suffering serious damage to its upper-works. It returned to service a couple of months later. 1879 wheels turned. Received a general overhaul in 1882, with particular attention to cylinders, valves and brasses [MOBR2]. 1883 general overhaul with particular attention to motion and bearings., and wheels turned.
26 'RABUCO'	w/n 389	d/w 1524mm 60". Extensive repairs 1875, including new rear tube-plate and tubes, new steel tyres, and new axleboxes. 1879 wheels turned, but subsequently replaced. Overhauled in 1882, as for no. 25 [MOBR2]. 1883 general overhaul with particular attention to motion and bearings, and wheels turned.
27 'ARANDA'	w/n 390	d/w 1524mm 60". Overhaul 1875, including 22 new tubes, wheels turned and new axleboxes. Boiler work in 1878 and wheels turned. Some work on boiler and cylinders in 1882, also a general overhaul to the tender [MOBR2]. 1879 wheels turned and bearings renewed, also boiler replaced by a spare and original refurbished for use in future as needed. Firebox subsequently patched. Boiler replaced with re-conditioned one 1883, also other repairs and heavy overhaul to tender, and wheels turned.
28 'LIMACHE'	w/n 391	d/w 1524mm 60". Major overhaul 1874 [MOBR2]. Loco employed on ordinary pass. trains in 1875 when given overhaul, including new steel bogie axles, new chimney, In late 1877 the boiler was rebuilt with a new firebox, the wheels were turned and new axleboxes fitted. 1879 a replacement spare boiler was fitted.
29 'VIÑA del MAR'	w/n 395	d/w 1524mm 60". Major overhaul 1874 [MOBR2]. Heavy overhaul in 1875, with new tube-plate, and other work. Overhauled 1876 with wheels turned and axleboxes replaced. In May 1876 collided head-on at Til-til with loco 32 , and suffered considerable front-end damage. A loco 29 (and three others above 28) is mentioned in the 1878 <i>MoI memoria</i> as working on the <i>FCS</i> . It is likely that it was this engine on loan to the <i>Sur</i> . Wheels turned 1883.
30 'QUILPUE'	w/n 396	d/w 1676mm 66", but source [7a] says driving wheels were 60". Major overhaul 1874 [MOBR2]. 1875 given overhaul including several new tubes and stays, new rod bronzes and repair to cow-catcher damaged by collision with a rock in the Tabón section. Overhauled 1876 with wheels turned and axleboxes replaced. 1878 repairs illegible so far. 1879 wheels turned and bearings renewed, also boiler replaced by a spare and original refurbished for use in future as needed. 1882 report explains d/w discrepancy by saying that wheels have been replaced by larger ones of 66" diam. for use on express trains, also some work on boiler, valves and pistons and

some

		tender platework renewed [MOBR2]. 1883 major overhaul of motion and tender.
31 'PEÑA BLANCA'	w/n 397	d/w 1372mm 54". Boiler exchanged for a new one in 1875, old boiler then repaired and available for use on another loco, new bogie fitted and tender axleboxes replaced. Overhauled 1876 with wheels turned and axleboxes replaced. 1878 repairs illegible so far. 1879 wheels turned. Driving wheels of 5' replaced in 1882-3 by those of 4' 6" for loco's use on goods trains, also some boiler work and most of the motion refurbished. resulting in loco and tender being in good condition [MOBR2].
32 'La CALERA'	w/n 398	d/w 1372mm 54". General overhaul in 1875 including repairs to valve gear, wheels turned, repairs to damage caused by accident, new chimney fitted, new drawbar, etc. In May 1876 collided head-on at Til-til with loco 29 , and suffered considerable front-end damage. A loco 32 (and three others above 28) is mentioned in the 1878 <i>MoI memoria</i> as working on the <i>FCS</i> . It is likely that it was this engine on loan to the <i>Sur</i> . A refurbished boiler was fitted in 1879.
33 'OCAO'	w/n 399	d/w 1524mm 60". Major overhaul 1874 [MOBR2]. Received a new set of wheels in 1875 and a new coupled axle owing to a crack in the previous Krupp steel axle, various other repairs also carried out. 1878 repairs illegible so far. 1879 new cylinders, wheels turned and tubes replaced. Wheels turned 1883.
34 'MONTENEGRO'	w/n 387	d/w 1524mm 60". General repairs and wheels turned in 1875. A loco 34 (and three others above 28) is mentioned in the 1878 <i>MoI memoria</i> as working on the <i>FCS</i> . It is likely that it was this engine on loan to the <i>Sur</i> . A refurbished boiler was fitted in 1879, and the wheels turned. Tubes replaced in 1882, and around forty new stays fitted [MOBR2]. Wheels turned 1883.



Hawthorn builder's photo, collection of Robert Humm

0-4-2 d/w 1422mm 56", cyls. 457x609mm 18x24", built by railway's Valparaiso shops in 1872

Nos **35-38** and **57** were built using Hawthorns and Avonside spares, and in some lists they are ascribed to these builders. Hawthorns' numbers 425 and 426 are reported in some lists for these locos [Copeland]. P. C. Dewhurst clearly thought that Hawthorn no. 425 had gone to Chile [letter in *The Locomotive* 15 March 1937]. Given that the majority of the railway's British-built 0-4-2s were rebuilt as 4-4-0s, mostly during the 1870s, the creation of a new 0-4-2 is difficult to understand. However, clearly there might have been a number of suitable sets of frames available.

35 'ESPOSICIÓN'

In service on San Felipe branch during 1873, and on Los Andes

branch in 1875 when taken out of service for overhaul, including firebox work and new stays. New bronzes fitted to tender axleboxes.

4-4-0 d/w & cyls. see notes for each loco, built by railway's own Valparaiso shops in 1872

Nos **35-38** and **57** were built using Hawthorns and Avonside spares, and in some lists they are ascribed to these builders. Hawthorns' numbers 425 and 426 are reported in some data for these locos [Copeland]. H. L. Ahrons listed no. **37** as being Hawthorn no. 425, and Dewhurst repeated this assertion. He wondered whether Hawthorn of Leith numbers 392-4 could be ascribed to these engines.

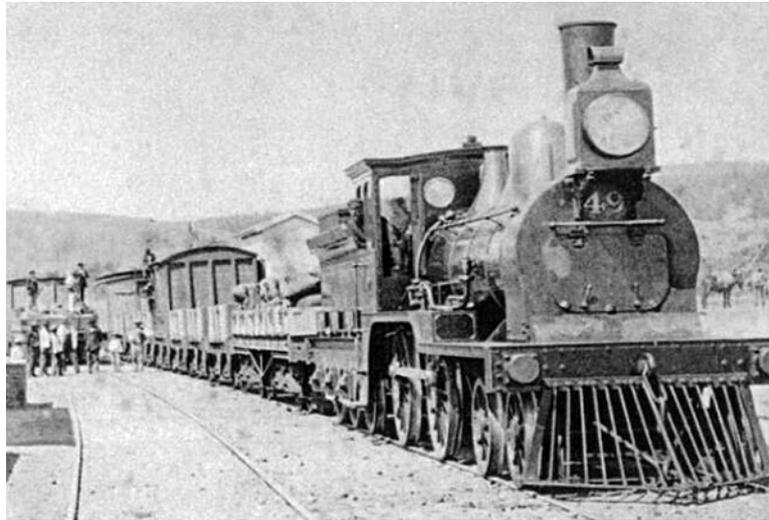
- | | | |
|------------------------|---|--|
| 36 'PORTEÑA' | d/w 1372mm 54", cyls. 457x609mm 18"x24". | Received tender from no. 22 in 1875. General overhaul in 1875 including wheels out for turning and new axleboxes. In late 1877 a replacement boiler was fitted with a reconditioned firebox, the wheels were turned and new axleboxes fitted. 1879 wheels turned. All tubes replaced in 1882-3, also some lower plates of boiler [MOBR2]. 1883 wheels turned. |
| 37 'Los ANDES' | d/w 1372mm 54", cyls. 457x609mm 18"x24", | Extensive repairs 1875. Overhauled 1876 with wheels turned and axleboxes replaced. Cylinders re-aligned in 1882-3 and one valve replaced, also some boiler, motion and tender work done [MOBR2]. |
| 38 'SAN FELIPE' | d/w 1422mm 56", cyls. 419x609mm 16½"x24". | General repairs 1875, including all wheels turned, driving axle reinforced and firebox repairs. Overhauled 1876 with wheels turned and axleboxes replaced. 1878 repairs illegible so far. 1879 wheels turned and bearings renewed, also boiler replaced by a spare and original refurbished for use in future as needed. Firebox subsequently patched. |

4-4-0 d/w 1422mm 56", cyls. 419x609mm 16½"x24", built by Avonside in 1875 (to no. 44) and 1876 (45 onward)

IRS Avonside list gives cyls. as 17.5" x 24" for these locos, ie. 444x609mm. Inside cylinders.

- | | | |
|-------------------------|----------|--|
| 39 'BELLA VISTA' | w/n 1076 | Wheels turned 1876. 1879 wheels turned and bearings renewed, also boiler replaced by a spare and original refurbished for use in future as needed. 1883 wheels turned. |
| 40 'BARÓN' | w/n 1077 | Wheels turned 1876. Minor damage owing to a washout near Colina in July 1877. 1879 wheels turned, but subsequently replaced. Front bogie replaced that year. |
| 41 'EI SALTO' | w/n 1078 | 1879 wheels turned. A loco 41 (and three others above 28) is mentioned in the 1878 <i>Mol memoria</i> as working on the <i>FCS</i> . It is likely that it was this engine on loan to the <i>Sur</i> . 1879 firebox patched. |
| 42 'La CRUZ' | w/n 1079 | Wheels turned 1876. 1879 wheels turned. |
| 43 'Las VEGAS' | w/n 1080 | Erected during first half of 1876. Some boiler work in 1882-3, including some tubes replaced [MOBR2]. |
| 44 'CHAGRES' | w/n 1081 | Erected during first half of 1876. |
| 45 'SAN ROQUE' | w/n 1098 | 1879 wheels turned. |
| 46 'CURIMÓN' | w/n 1099 | |
| 47 'QUILICURA' | w/n 1100 | 1883 general overhaul including boiler work, and wheels turned. |
| 48 'YUNGAI' | w/n 1101 | 1879 wheels turned. 1883 general overhaul including boiler work, and wheels turned. |

49 'CENTINELA'	w/n 1102	1879 wheels turned.
50 'CABRITERÍA'	w/n 1103	1879 wheels turned. 1883 general overhaul including major boiler work, and wheels turned.
51 'La CAMPAÑA'	w/n 1104	1879 wheels turned. 1883 wheels turned.
52 'ALMENDRAL'	w/n 1105	1883 wheels turned.
53 'ANJEL C. GALLO'	w/n 1106	
54 'I. WADDINGTON'	w/n 1107	1879 wheels turned.
55 'MATIAS COUSIÑO'	w/n 1108	
56 'JORGE LYON'	w/n 1109	1879 wheels replaced. 1883 wheels turned.



No. 49, showing the original extremely small diameter buffers.



Number 50, with later larger diameter buffers.

0-4-4T d/w 1524mm 60", cyls. 419x660mm 16½"x26", built at railway's Valparaiso shops in 1883

Nos. 35-38 and 57 were built using Hawthorns and Avonside spares, and in some lists they are ascribed to these builders. Hawthorns' numbers 425 and 426 are reported in some data for these locos [Copeland]. See notes re nos. 36-38. This loco was grouped together with the rebuilt no. 6 in the post-1908 *EFE* diagram book, so they may have looked very similar.

57 'CHILENA'

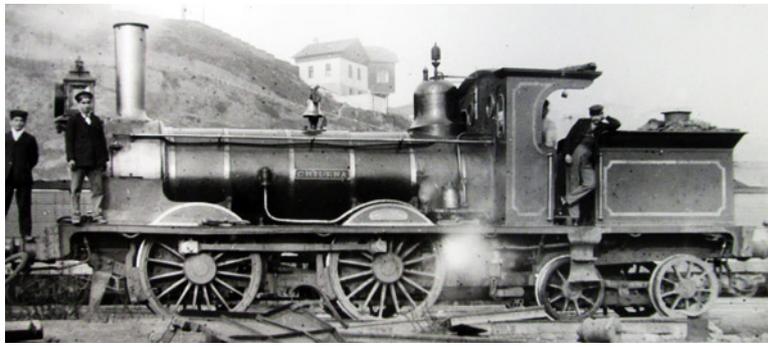


Photo from P. C. Dewhurst collection in NRM at York.

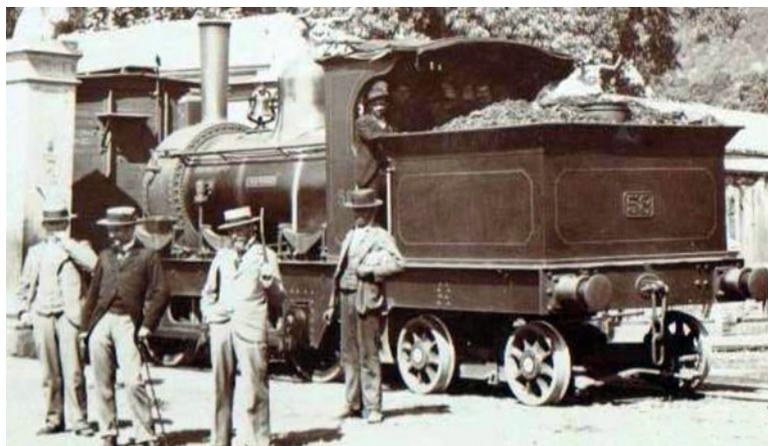
0-6-0T then 0-6-4T d/w 1220mm 48", cyls. 270x406mm 10½"x16", built at railway's Valparaiso shops in 1873

These locos originated from Sturrock steam tenders supplied with nos. **11-13**. Confirmed by [1]. The presence of a flat-topped dome over the firebox suggests that these two 'home-made' locos had been fitted with boilers that originated from the first Hawthorn-built 0-4-2s.

58 'ARDILLA'



This seems to be the first incarnation of 'ARDILLA' as an 0-6-0T, later to be rebuilt as an 0-6-4T as below. It looks as though the change involved the installation of a different boiler as the steam dome position seems to have moved forward. That shown above has a firebox-mounted dome and may well have come from one of the Hawthorn 0-4-2s. In the loco's later form presumably a back tank was also provided beneath the large bunker.



0-6-0T d/w 1220mm 48", cyls. 270x406mm 10½"x16", built at railway's Valparaiso shops in 1876

This loco originated from a Sturrock steam tender supplied with nos. **11-13**. Confirmed by [1]. The second of these

tenders to be used in the building of one of these locos had until 1875 been attached to no. **20 'SAN PEDRO'**. Strangely, the 1877 *Mdl memoria* gives this new loco the number **32** (which must be a mistake as the number **32** is given a few lines later to another loco), though with the name **'ABEJA'** as below, and says that the tender used came from loco **19**. On completion in early 1876, it went into shunting service in Santiago, replacing no. **58** which returned to Valparaiso for repairs after three years use.

59 'ABEJA'

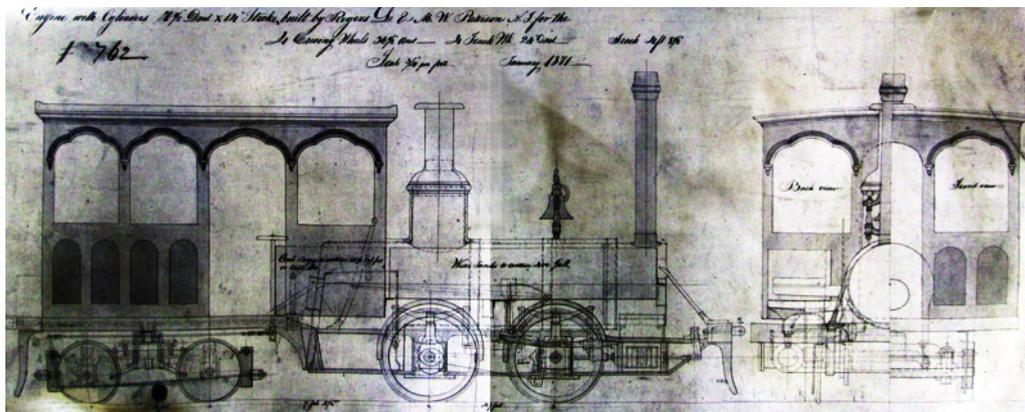
0-4-4T *d/w 925mm 12½", cyls 177x355mm 7"x14", built by Rogers in 1872*

This locomotive was supposedly brought "over the mountains from Peru" [Copeland], whilst another source [R. Whetham] suggests that it was in fact the property of the standard gauge *FC Ilo a Moquegua* in southern Peru, and that it was 'spoils of war' to the Chilean Army during the War of the Pacific. Chilean forces had put the line out of action to deny use of it to the Peruvians, and it was only rebuilt early in the 20th century. Another commentator, on the other hand, suggests that it was the Pacasmayo, Guadalupe and Yonan Railway's **'CHILETE'**, again commandeered by the Chilean armed forces as spoils of war [54]. Whatever its source, the loco will have required regauging for use in Chile, and one source suggests that it was for a while an 0-4-2T.

Recent research has clarified the probable origin of this loco. For a while it seemed much more likely that it was in fact the *FCIM*'s **'EI HUANACO'** as Bob Whetham had suggested. First, comparison of the *EFE*'s diagram sheet for **'PLACILLA'** with a Rogers GA blueprint for the first of several mechanically-similar 0-4-4T 'passenger ponies' supplied to Peru – and incidentally to no-where else – shows that in overall visual appearance and principal dimensions they were almost identical. Second, a photo and drawings of the *FPCGY*'s **'CHILETE'** [54] shows that it looked very different, as did the *FC Lima y Huacho*'s identical Rogers 2-2-0Ts nos. **9** and **10**.

The three known Rogers 0-4-4Ts were w/n (1896) of 1871 supplied to the *FC Lima y Oroya* as their no. **5** (later no. **24**) **'FAVORITA'**; w/n (1899) of 1871 which went to the *FC Arequipa y Puno* as no. **9** **'EXPLORADOR'** later becoming *FCS* no. **27** and eventually **'ARAQUIPEÑA'** (having in the interval spent some time as a 4-2-4T named **'HATUNCOLLA'**); and w/n (2032) of 1872 which was bought by the *FC Ilo y Moquegua* as **'EI HUANACO'**. It was thought that this last of the three had disappeared from Ilo during the War of the Pacific, probably abducted by the invading Chilean army. However, documents recently discovered confirm that the remains of each of the *FCIM* locos, including **'EI HUANACO'**, survived derelict in Ilo as late as the 1890s. The other two had long service lives on their respective railways. The sudden appearance of **'PLACILLA'** in Chile in 1884, regauged to 5' 6", still seems likely to have resulted from the capture of a Peruvian machine, but possibly from one of the other railways on the coast that were temporarily commandeered during the war.

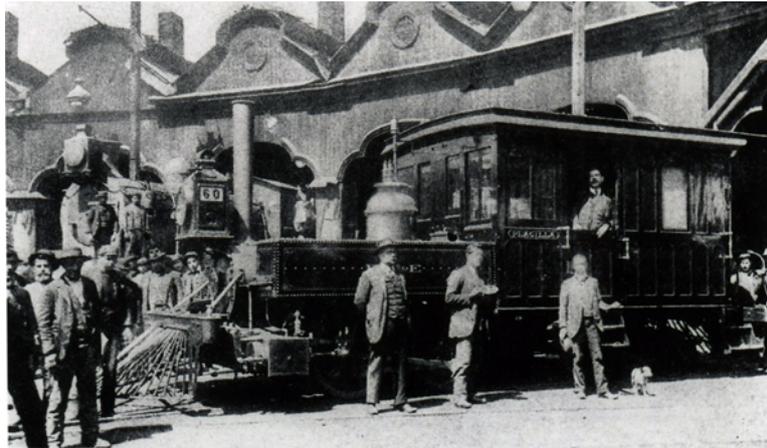
60 'PLACILLA' w/n (2032 in CF list) Entered *EFE* stock in 1884 as no. **60**.



The sketch above is from a Rogers blueprint, showing a standard gauge inspection saloon with the same dimensions as **'PLACILLA'**. The drawing is dated January 1871, so this was probably the first of the three known examples, though most photos show it with a clerestory roof possibly a later modification. Interestingly the end elevations are labelled 'Front view' meaning the saloon end, and 'Back view' meaning the chimney end – very logical for an inspection saloon.



The FC Arequipa y Puno's no. 9 'EXPLORADOR', showing what 'EI HUANACO'/'PLACILLA' might well have looked like when new. Note the cow-catcher/pilot at the saloon end as well as the chimney end.



This photo of 'PLACILLA' was taken at a major roundhouse, probably San Eugenio, or possibly at Barón. The wooden body is somewhat different to that shown above, but may well have been a replacement.

In a *Ministerio del Interior* annual *memoria* for 1883 is a reference to *una pequeña remolcadora*, a small shunter/switcher, no. 1A. It is possible that this was 'PLACILLA' as above, or it may have been something different.

Modifications

Possibly as many as ten of the sixteen individual 0-4-2s in the *FCSV*'s 1st, 2nd and 5th classes were rebuilt as inside cylinder 4-4-0s [7a].

Many locos received larger driving wheels around 1870, and in any case it was customary to put larger wheels on newly-overhauled locos to fit them for express work, whilst engines in poorer condition gained smaller wheels to equip them for slower speed haulage until they went in for repair. After the grouping into the *EFE* in 1883-4 all *FCSV* locos retained their original numbers [6]. NB the repairs set out above should not be taken as a comprehensive list, being intended merely as a summary of the more major tasks undertaken. If studying such procedures in detail do refer to the original sources.

1.1.2 *El FC del Sur*

1855-1884

Background

The *FCS* was constituted in October 1855, and the first section to San Bernardo opened in 1858; to Rio Maipo 1858, to Rancagua 1859, to San Fernando 1862, and to Curicó 1868 (the contractor was Sr. Garland). The government took over all of the shares on 5th September 1873.

General notes on *FCS* locomotives

Unlike the *FCSV*, the companies operating south of Santiago greatly preferred American-built locos usually by Baldwin or Rogers, though the very first two engines on the *FCS* were from R. & W. Hawthorn.

The first loco list for this line is the Chief Engineer's report in a *Ministerio del Interior memoria* for 1862, which shows seven of the first nine locos in the list below, though not 'SAN BERNARDO' or 'MAPOCHO'. 1872-3 operational notes are from six-monthly *Informes Senestral del FC del Sur* for shareholders in late 1872 and early 1873, in the *Biblioteca Nacional* in Santiago. These early reports gave only names for locos. The numbers were reported in an 1883 fleet list for the *FC Santiago a Talca*, and reproduced in the 1943 history of Chile's railways. These have been added, from here down to *FCCCiT* loco **25**. [7] confirms these numbers.

After the grouping into the *EFE* in 1883-4 these *FC del Sur* engines were renumbered from **61** upward, though possibly with some gaps [6].

FCS locos burnt wood until the late 1860s when access became easier to Concepción area coal mines [7a].

Hudson feed water heaters

In 1859 a Mr. Hudson designed a feedwater heater, comprising a cylinder filled with small tubes that ran from a chamber at one end to another chamber at the other end. These heaters are reported to have been fitted to a number of the *FC del Sur*'s locos.

2-4-0 d/w 1575mm 62", cyls. 381x509mm 15"x20", built by R. & W. Hawthorn in 1856

Ordered August 14th according to R&WH order book 2. No delivery date given. No name specified in order book, unlike for loco no. 2.

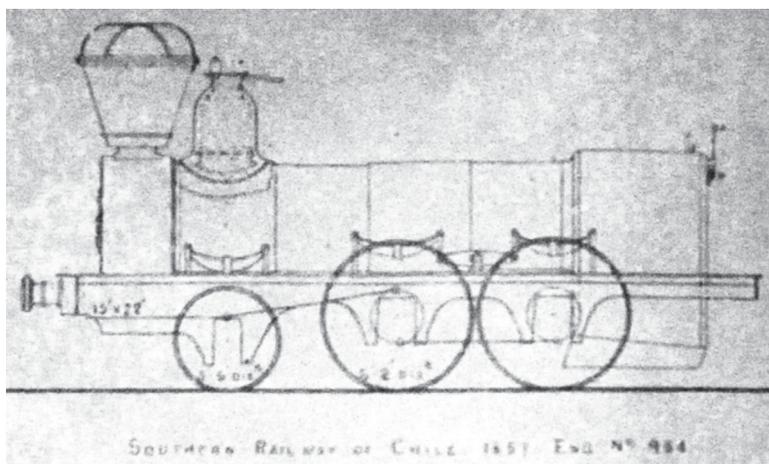
1 'MONTT'

w/n 984

preso'

Ran 10,584 miles in year 1863-4, and 11,044 km in year 1864-5 [all these 1863-4 and 1864-5 mileages were from September to September and found in MINT866]. Listed as used for 'tren ex-ie. passenger trains, at that time. Mid-1873 good condition but tyres needed turning. Fitted with new steel tyres in 1875 and as urgent boiler repairs were needed a number of other repairs and improvements were made. Air brake fitted 1876.

New pistons fitted in late 1877. Wheels turned 1878. 1882 rebuilt as a 4-4-0. At end of 1883 had 15x22" cyls. On 20th Dec. 1883 moved from Talca to Santiago to be used for shunting until a decision would be made about its withdrawal or rebuilding. Became *EFE* no. **67**. Confirmed by [6] but cyls 81x558mm in that source, and also in 1875 *MoI memoria*. [8] shows photo of **1 'MONTT'**. Brian Rumary's R. & W. Hawthorn list shows loco as a 4-2-0 but this must be incorrect.



A sketch found in a folder of Hawthorn diagrams amongst the P. C. Dewhurst collection at the NRM in York.



Note the extended chimney when compared with the diagram above.

0-6-0 d/w 1371mm 54", cyls. 406x610mm 16"x24", built by R. & W. Hawthorn in 1856

2 'VARAS'

w/n 985

Ran 20,691 miles in year 1863-4, and 34,458 km in year 1864-5.

Listed as used for 'carga' ie. goods trains, at that time [MINT866].

1872-3 good condition with new tyres. 1874 broke an axle. 1875

boiler repairs and tyres turned. Light repairs late 1876. New

pistons and other motion work in late 1877. In 1878, major repairs

and new cylinders being needed, the loco was withdrawn and a

driving axle used for no. **13**, the recommendation being that the remaining parts be dismantled and used wherever necessary.

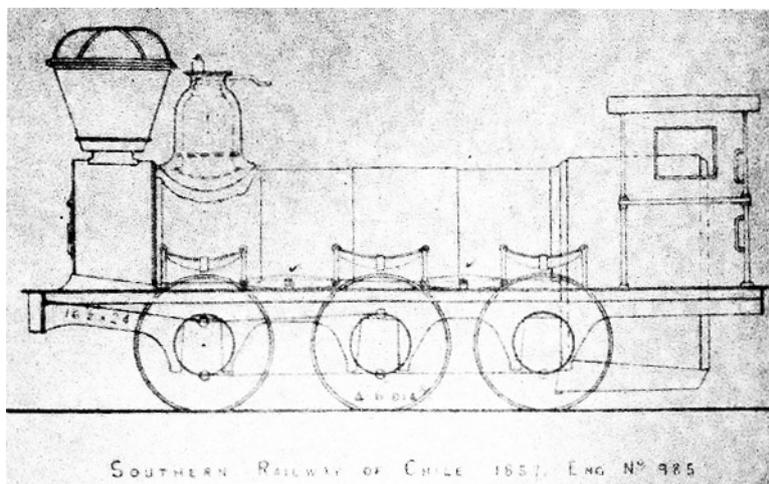
Confirmed OoS in 1880 *MoI memoria*. It was withdrawn officially

in 1883 and *name and number reused* [7a]. *MoI memoria* for 1883

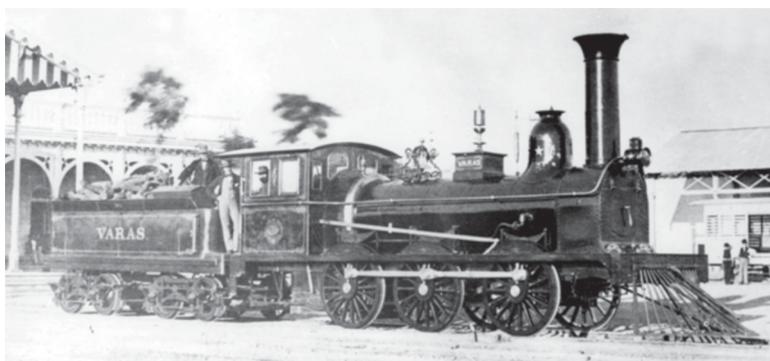
confirms that it had been out of use for four years, and in 1882-3 was

officially replaced as no. **2** by one of the new locos from the USA;

see next entry.



A sketch found in a folder of Hawthorn diagrams amongst the P. C. Dewhurst collection at the NRM in York.



Note the much taller chimney, and the modified cab, when compared with the diagram above.

2-6-0 d/w 1422mm 57 5/8", cyls. 432x609mm 17"x24", built by Rogers in 1883

Ordered by FCCCiT with other locos of same type. See that section below for further details.

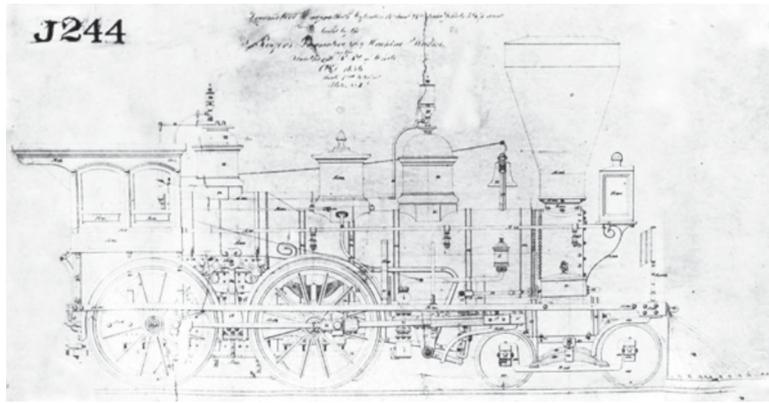
2 'VARAS' w/n 3204 Arrived October 1883. Became *EFE* no. **122**.

4-4-0 d/w 66" (?), cyls. 14x24", built by Rogers in 1856

Rogers order number J-244 1, shipped Dec 1856 as "passenger engine". Rogers data sheets in PCD archive state that special features included: on both sides a proper sized copper steam pipe running from the boiler and connected with feed pipes to throw surplus steam into the tank (shown on back view). Note the twin steam domes fitted to these locos. Fuel: wood, coke, or a combination. NB The Rogers blueprint for order J-244 (in the P. C. Dewhurst collection) seems to show driving wheels of 54 or 56" diameter, rather than 66".

3 'SANTIAGO' w/n (728 in CF list) Ran 19,268 miles in year 1863-4, and 26,023 km in year 1864-5.

Listed as used for '*tren expreso*' ie. passenger trains, at that time.
 d/w 1676mm 66", cyls. 355x609mm 14"x24", Derailed 28th April 1861. 1873 good condition with new tender tank. 1874 changed the wheels for ones with steel tyres. Overhauled 1876 with tyres turned and air-brake fitted. Four tender wheels replaced in late 1876. New bogie frame in 1878 as original had cracked, also wheels turned. 1882 in service. 1883 in regular service. Became *EFE* no. **62** and renamed '**PELEQUEN**' to avoid confusion with *FCSV* loco '**SANTIAGO**' [].



Taken from a photostat copy of a Rogers GA side elevation blueprint in the P. C. Dewhurst archive at the NRM in York.

4-4-0 d/w 54" , cyls. 16x24" , built by Rogers in 1856

Rogers order number J-245 1, shipped Dec 1856 as "freight engine". Rogers data sheets in PCD archive list no special features. Fuel: wood, coke, or a combination.

4 'SAN BERNARDO' w/n (727 in CF list) Ran 24,585 miles in year 1863-4, and 21,806 km in year 1864-5. Listed as used for 'carga' ie. goods trains, at that time [MINT866]. d/w 1422mm 56" , cyls. 419x609mm 16½"x24"m but 16" bore in 1875 memoria, 1872 received new tender tank. 1873 in use but needed repair. 1874 new pistons, eccentrics and chimney. 1875 retubed and new steel tyres. Driving wheels turned in late 1876, and a new piston and valves fitted. Wheels turned 1878. After derailment at San Rafael in October 1882 was rebuilt. 1883 general overhaul including new firebox tubeplate. At end of 1883 had 56" d/w. Became *EFE* no. 76.



4-4-0 d/w 63" , cyls. 14x24" , built by Rogers in 1856

Rogers order number J-323 1-2, ordered Oct 1856 as "passenger engines". Rogers data sheets in PCD archive list special features: feed water heater, Hackworth double exhaust port, screw washout plugs (instead of plates), counterbalance spring instead of dead weight, injector check screw to boiler instead of riveting (on account of breakage in loading), a steam jet at pilot to drive cattle off track. Fuel: wood.

5 'MAIPÚ' w/n (847 in CF list) Ran 5,160 miles in year 1863-4, and 1,068 km in year 1864-5. Listed as used for 'tren expreso' ie. passenger trains, at that time. d/w 1676mm 66" (or 1600mm 63" according to [6]), cyls. 279x559mm 14"x22" , 1875 memoria says 14"x24" . 1871 boiler replaced. 1873 good condition with new tender tank. 1874 new set

of

tubes and tyres turned, various other repairs. 1875 tyres turned and two fractured cylinder end covers replaced. Overhauled 1876 with tyres turned and air-brake fitted, also two new pistons and valves later that year. One driving wheel tyre changed in late 1877, owing to a fault. Extensive rebuild in 1879-80, involving replacement of tube-plates and tubes. 1882 in service. 1883 partial overhaul of motion and a new set of tubes to keep it going until a new US-built boiler arrives - expected during 1884. Rebuilt as a 4-4-0TT, Became *EFE* no. **61 'REQUÍNOA'**.

6 'RANCAGUA'

w/n (848 in CF list) Source [41, p50] states that a loco 'RANCAGUA' and its driver Sr. Gustavo Ames had been involved in the working of building the final section of the *FCSV* until its arrival in Santiago in July 1863. If correct, it presumably meant that this engine had been on hire to Henry Meiggs, the contractor. Alternatively the name might have been that of the *FCSV* loco 'ACONCAGUA' but misread by Sr. Oleachea. Ran unrecorded miles in year 1863-4, and 18,534 km in year 1864-5. d/w 1676mm 66", cyls. 355x559mm 14"x22" (or 279x609mm 14"x24" according to [6] and to 1875 memoria) Wheels given as 63" in 1875. 1872 used solely on ballast trains to Palmilla as needed new boiler urgently. 1873 under overhaul. 1874 wheels replaced, problem with one tyre. 1875 new tyres and air-brake fitted. General repairs 1877, and 30 new tubes. Wheels turned 1878. 1882 in service. 1883 partial rebuild of motion and tender, also new set of tubes; then went into service between Talca and Curicó. At end of 1883 recorded with 11" cylinder bore(?) Became *EFE* no. **63**.



4-4-0T d/w 1067mm 42", cyls. 535x609mm 21"x24", built by Rogers in 1860

Rogers order number J-374 1, shipped June 1860. Rogers data sheets in PCD archive list special features: bissell truck, Radley & Hunter patented stack, cylinder cocks operated from footboard, grates [to be] cast iron previously wrought iron, 50lbs rail longitudinal bearings 100ft grade for 2 1/2 miles, 200ft curves to stop and start with 20 to 25 cars on grade, feedwater heater arranged with cutoff so all exhaust steam can be used for blast. Fuel: wood. Strangely the data sheet in the PCD archive is headed in this case as "CANADA CITY RY. OF THE SOUTHERN RY. OF CHILE", which was probably a mis-interpretation of something written in Spanish.

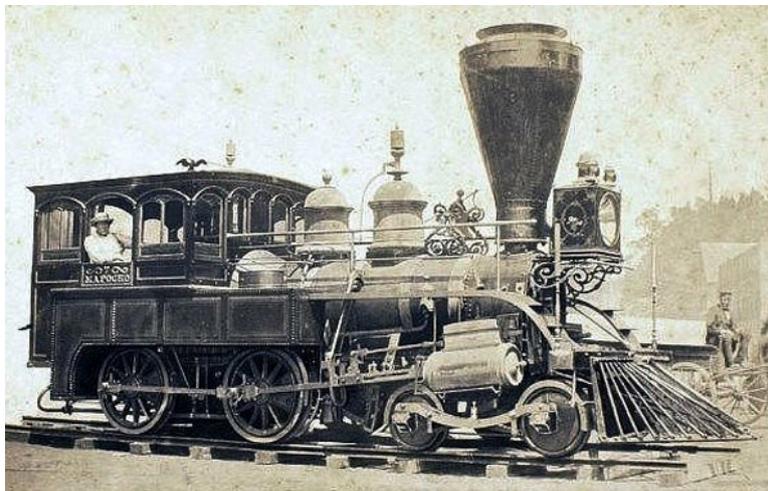
7 'MAPOCHO'

w/n (932? in CF list) 1872 recently received new wheels and other minor repairs.

1873 needs new firebox and tubes. In 1875 22 tubes replaced. Tender overhauled in 1876 with new wheels having steel tyres. New valves fitted in late 1876, also a pair of bogie wheels replaced and alterations made to chimney. Various motion repairs in late 1877 and a new chimney. Comprehensive overhaul in 1878, with new

boiler plates and tubes, wheels turned, and a new cab. 1882 in service. 1883 varied repairs to motion, driving and tender wheels turned, new set of tubes, etc. Then into service making up trains at Santiago station – “*un trabajo bastante forzado*”. At end of 1883 recorded as having 14x22" cyls. Rebuilt as 0-4-2T at some point. In early 1883 a loco ‘**MAPOCHO**’, which may have been this engine or that belonging to the *FCSV*, was reported on loan to the *FCCCiT* and in service on goods trains between Concepción and Talcahuano. 1884 spent most of the year at Talcahuano, being very little used; total kilometrage to date for the *FCCCiT* was 19,150. It became *EFE* no. **117** and was renamed ‘**BIO-BIO**’ to avoid confusion with *FCSV* loco ‘**MAPOCHO**’ [].

NB Pablo Moraga has pointed out that this loco may well have become *EFE* no. **61**, rather than **117**, as a diagram sheet of no. **61** shows the same pattern of tank, albeit with a different cylinder size. See discussion below at *EFE* no. **61**.



4-4-0 d/w 1676mm 63", cyls. 355x609mm 14"x24", built by Rogers in 1860

Rogers order number J-403 1 “passenger engine”, shipped Dec 1860. Rogers data sheets in PCD archive list special features: one whistle, grate with drpop bar (previously all bars dropped), firebox with solid door ring. Fuel: wood. Tender frame of wood but iron-plated.

8 ‘RENGO’

w/n (997 in CF list) Ran 14,218 miles in year 1863-4, and 17,756 km in year 1864-5.

Listed as used for ‘*tren expreso*’ ie. passenger trains, at that time.

Wheels 1600mm 63" acc. to [6] and 1875 memoria. 1873 good condition. 1874 wheels changed, boiler overhauled. Major overhaul in 1875-6, and air brake fitted later that year. New pistons, valves and oil-pots fitted later that year. General repairs 1877, with new tyres, some new tubes and various other bits and pieces. 1882 in service. 1883 partial overhaul of motion and tender, in service on branch to Palmilla, but will need a new boiler within the year. At end of 1883 recorded as having 21x24" cyls (However, it looks like this may have been a misprint). Became *EFE* no. **64**.

4-4-0 d/w 1371mm 54", cyls. 406x609mm 16"x24", built by Rogers in 1860

Rogers order number J-404 1, shipped Dec 1860. Rogers data sheets in PCD archive list special features: grate arranged for coal, tubes extra thick at firebox end, combustion chamber. Fuel: wood [but note mention of coal on previous line].

9 'SAN FERNANDO'

w/n (998 in CF list) Ran 17.853 miles in year 1863-4, and 33.385 km in year 1864-5.

Listed as used for 'carga' ie. goods trains, at that time [MINT866].
Wheels 1422mm 56" acc. to [6] and 1875 memoria, cyls.
406x609mm. 1872 heavy overhaul. 1873 good condition but tender tank needed rebuilding. 1875 new steel tyres fitted, and converted to carry coal fuel instead of wood. 1876 tender overhauled and given a new tank. New pistons, valves and oil-pots fitted later that year. 1877 boiler examined and 25% of tubes replaced. Extensive overhaul in 1879-80 involving new axleboxes and brasses, new valves, some boiler work and a new cab. Late 1882 out of service owing to a collision with a goods train at Nos; to be rebuilt as soon as possible with a new firebox and tubes from USA. 1883 heavy overhaul with new boiler built in the workshops and using the new US-built firebox mentioned previously, also new cab and cow-catcher/pilot; back into service in as-new condition. At end of 1883 d/w recorded as 56". Became *EFE* no. 77.

2-2-0T steam car d/w 1085mm 42³/₄", 114x279mm 4¹/₂" x11", built by Rogers in 1862

Rogers order number J-414 1, ordered Oct 1860. Rogers data sheets in PCD archive list special features: vertical boiler 24" OD,

10 'EXPRESO'

later **'RELÁMPAGO'**

w/n (1013 in CF list) Rebuilt as a 12-passenger steam railcar, probably with a trailing

bogie. 1873 good condition. 1874 boiler repaired, motion overhauled, interior refurbished, exterior painted. New pistons, valves and oil-pots fitted in late 1876, and bogie wheels changed. Wheels turned in late 1877. Entirely reconstructed in 1878, with new larger cylinders, water tank relocated beneath the saloon floor to equalise axle loadings, the bodywork worked on and the saloon re-upholstered in a manner more attractive and elegant. Was reported to be working well at end of 1879. In service 1882. In 1883 was destroyed in a collision with a goods train hauled by *FCCCiT* 2-6-0 no. 27 **'MIRAFLORES'** on the morning of 28th October between Talcamávida and Buenuraqui (on the Concepción line north of San Rosendo).

5° Informe Anual de la
Junta Directiva del
Ferrocarril del Sur
(sep. 30, de 1860)

Encargos al extranjero

El aumento del tráfico ha hecho ver al Director la necesidad de proveerse de más poder locomotor, i al efecto se han encargado al extranjero tres máquinas más, es decir la "Mapocho" que fue embarcada el 1° de agosto próximo pasado; esta locomotiva no es ni de tantas dimensiones ni poder como las que ahora corren por la línea, i es destinada a llevar carros de carga por el ramal de

sangre, y trenes livianos o extraordinarios de pasajeros por la línea principal, las otras dos, la "Rengo" y "San Fernando" son del mayor poder que se puede usar en vuestra línea; al mismo tiempo, se encargó una pequeña máquina llamada "Espresso" para el servicio de la empresa, para llevar mensajeros i empleados a lo largo de la línea en casos imprevistos, evitando de este modo el tener que aprontar una locomotiva grande que siempre demanda tiempo y gasto.

José T. Urmeneta

Sr. Urmeneta's explanation as to the respective roles of the new locomotives '**MAPOCHO**', '**RENGO**' and '**SAN FERNANDO**', and the inspection car '**EXPRESO**'.

4-4-0 d/w 1676mm 66" (Rogers lists say d/w 1600mm 63", as does 1875 memoria), cyls. 381x609mm 15"x24" (Rogers lists say 14"x24"), built by Rogers in 1862.

Rogers order number J-???, shipped Oct 1862. Rogers data sheets in PCD archive list no special features. Tender frame of wood but iron plated. Fuel: wood.

11 'TINGUIRIRICA' w/n (1047 in CF list) Ran 22,044 miles in year 1863-4, and 29,851 km in year 1864-5. Listed as used for '*tren expreso*' ie. passenger trains, at that time. 1872 received new bearings and valves, good condition. 1873 good condition. 1875 received new boiler and was still under reconstruction at end of that year. The old boiler was rebuilt for use as a spare. Also received a replacement tender in 1876 and was fitted with air-brake and new valves later that year. New pistons fitted in late 1877. In service 1882. 1883 partial overhaul of motion and tender, in service on branch to Palmilla. At end of 1883 d/w were recorded as 63" and cyls. 14x24". Became *EFE* no. **121**.

4-6-0 d/w 1270mm 50", cyls. 432x609mm 17"x24", built by Rogers in 1862

Rogers order no. J-424. 1875 memoria says d/w 51".

12 'CONTRATISTA' w/n (1030 in CF list) [7] says this was acquired first by Meiggs for the construction of the *FCSV*, and then sold to the *FCS* in 1865 supposedly because it had proved unsuitable for long-term use west of Santiago. Jorge

Lyon's 1874 report [] suggests that this engine was modified in a number of ways on its arrival on the *FCS*, but he was trying to make a point and this needs treating with scepticism until confirmed from other sources. 1872 needed new boiler urgently. 1873 under overhaul. March 1874 involved in tests on *FCSV* against no. **30** 'QUILPUE' [27].

By 1876 was the only loco not yet fitted with steel tyres rather than iron, though other *memoria* report says retubed in 1875 and temporarily given new tyres to replace damaged ones, until the new steel ones arrived. 1877 *memoria* suggests new wheels fitted at time steel tyres were fitted, also general repairs and a new tender tank. New valves fitted in late 1876 and alterations made to chimney. In 1877 50 tubes changed and it was noted that the firebox wrapper will need to be replaced soon. In 1878 a new tube-plate, set of tubes and lower boiler plates were fitted. The motion was overhauled, and the cab, running boards, and tender frame renewed. 1882 firebox and tubes replaced, cylinders and wheels turned, motion made new. 1883 in good condition but with some tubes replaced. At end of 1883 cyls. were recorded as 17x24", and d/w as 51". Became *EFE* no. **82**.

0-6-0 d/w 1371mm 54", 406x609mm 16½"x24", built by Hawthorn in 1866 [7]

Ordered by a Mr. Woods for the Southern Railway of Chile.

13 'CHILENA' w/n 1285 Built as an 0-6-0 and then rebuilt to 2-6-0 in 1882. 1872 good condition with new tyres, but 1873 in use but needing new tubes and tyres(?). 1874 wheels changed owing to work tyres. Received major overhaul in 1875. Repaired early 1876 after accident with no. **4**, and received general repairs later that year. In 1877 received new cylinders, "as a result of negligence of the driver" which presumably means through severe priming. In 1878 a driving axle was borrowed from the withdrawn no. **2**. Complete rebuild in 1882, gaining a *bogie sencillo jiratorio* (pony truck) and a new boiler built in the workshops; back into service in August. 'Reconstruida. M del F en S y S. 1882', 1883 giving good service. Working in 1884. Became *EFE* no. **83** 'LINDEROS', renamed to avoid clash with loco **57** 'CHILENA' ex *FCSV*.

? *d/w ?, cyls. ?, built by Avonside in 1868 and 1869.* Certainly not in *FCS* stock in 1875 or at end of 1883.
 ? w/n ? Became *EFE* no. **124** 'PANGUILEMO'
 ? w/n ? Became *EFE* no. **125**. Possibly named 'ANGEL PRIETO i CRUZ'

4-4-0 d/w 1371mm 54", cyls. 16½"x24", built by Rogers

Rogers order number J-620 1, shipped Aug 1868 as "freight engine". Rogers data sheets in PCD archive list special features: Wroters smokebox door [?], swing engine truck.

14 'CURICO' w/n (1532? in CF list) Built 1868. cyls. 419x609mm 16½"x24". Rebuilt with d/w 1422mm 56"?, and 1875 *memoria* confirms. 1873 good but needs new tubes. 1874 general overhaul, including boiler, also wheels replaced by ones with new tyres. In 1875 retubed and driving tyres turned, also bogie wheels changed. Heavy overhaul in 1877,

including replacing a cracked frame, turning wheels and fitting a new front running plate. Tender replaced later that year. In late 1879 received major boiler work with new tubeplate, new tubes and some replacement of boiler plates, also wheels turned, a new tender supplied (sic), and air brake fitted. Rebuilt in late 1882 after a derailment at Barriales in September; new tubes, and new cab, tender tank rebuilt, etc. 1883 bottom end in good condition but awaiting a new boiler from the US. At end of 1883 cyls. were recorded as 16x24", and d/w as 56". Became *EFE 78*.

4-4-0 d/w 1371mm 54", cyls. 16½"x24", built by Rogers

Rogers order number J-770 1, ordered Feb 1871 as "freight engine". Rogers data sheets in PCD archive list special features: crossheads wrought iron, three ½" square rings on piston, injector larger than that on order J-620, mud drum, cab rood canvas painted previously tin, plugs for cleaning top of crown, revolving valve throttle in dome, ornamental finish [to be] as plain as possible to make lerss cleaning. Fuel: coal.

15 'PALMILLA' w/n (1900 in CF list) Built 1871. cyls. 419x609mm 16½"x24". 1872 received new chimney and regulator. 1873 good condition. 1874 boiler inspected and some tubes replaced. 1875 tubes replaced, tyres turned and general repairs. 1875 memoria says on 56" wheels then. 1877 firebox stays replaced in 1877 and tender wheels. Late 1882 was in good condition except for tubes needing replacement soon. 1883-4 in good condition having had some tubes replaced and other boiler work, also motion attention and loco tyres turned. At end of 1883 cyls. were recorded as 16x24", and d/w as 56". Became *EFE 79*.

4-4-0 d/w 1616mm 63 3/8", cyls. 14"x24", built by Rogers

Rogers order number J-878, shipped June 1872 as "passenger engine". Rogers data sheets in PCD archive list special features: plugs in backhead for cleaning crown, water joints between engine & tender slip & ball metal joints, slide valve throttle in dome. Fuel wood -- coal (separate).

16 'TENÓ' w/n 2303 Built 1873. cyls. 355x609mm 14"x24". 1875 various light repairs. 1875 memoria says on 63" wheels then. Air brake fitted 1876, also 50 tubes replaced. General repairs in 1877 as had covered 150,000km since previous overhaul, including turning the wheels and replacing the tender wheels, also renovating the motion. In service 1882. 1883-4 in good condition. At end of 1883 cyls. were recorded as 14x24", and d/w as 63". Became *EFE 65*.

4-4-0 d/w 1371mm 54", cyls. 16½"x24", built by Rogers

Rogers order number J-880 1, ordered Feb 1871 as "freight engine". Rogers data sheets in PCD archive lists no special features. Fuel: wood-coal (separate).

17 'CACHAPOAL' w/n 2309 Built 1873. cyls. 419x609mm 16½"x24". 1875 54 tubes replaced and tyres turned. Changed 1/3 of tubes in 1877 and turned the wheels. Rebuilt with d/w 1422mm 56" and 1875 memoria confirms this. Late 1882 received major repairs including new tyres and a new firebox tubeplate. 1883-4 in good condition, and working at the Maule quarry since April 1883. At end of 1883 cyls. were recorded as 16½x24", and d/w as 56". Became *EFE 80*.

2-6-0 d/w 1422mm 56", cyls. 432x609mm 17"x24", built by Rogers in 1874

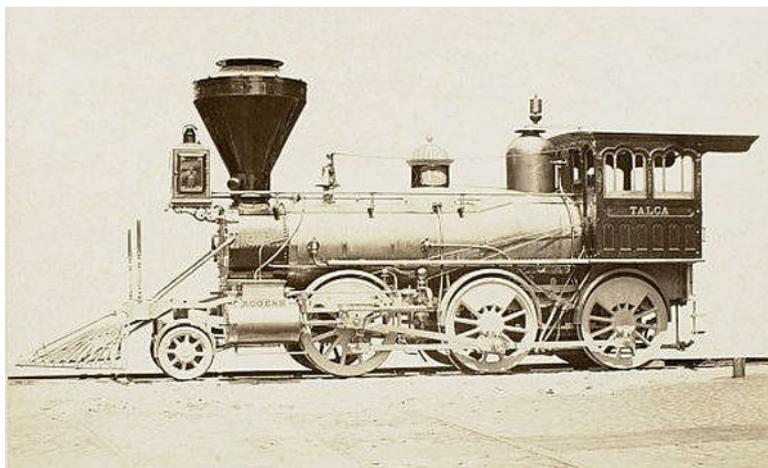
Rogers order number J-905 1, shipped Oct 1874 as "freight engine". Rogers data sheets in PCD archive lists special features: boiler conical connection [?], steam chest valve double ported, engine truck Bissell-Hudson, water connection rubber hose. Fuel wood-coal (separate).

18 'TALCA' w/n 2379 Front end damaged in January 1875 by collision with two wagons near Paine, repaired rapidly. Carrying wheels replaced 1876, also steampipes in smokebox. In 1878 the set of tubes was replaced, also a number of stays, and a full set of loco and tender wheels. In workshops at end of 1879 receiving new firebox wrapper. Late 1882 broke a crank-pin. 1883 major boiler work including a new firebox tube-plate, wheels turned and motion overhauled. At end of 1883 cyls. were recorded as 17x24", and d/w as 56", ie. as built. Became *EFE 84*.

2-6-0 d/w 1422mm 56", cyls. 432x609mm 17"x24", built by Rogers in 1874

Rogers order number J-906 1, shipped Oct 1874 as "freight engine". Rogers data sheets in PCD archive lists no special features. Fuel: wood-coal (separate). Tender frame wood iron-plated.

19 'LONTUE' w/n 2380 Received Jan. 1875. Minor firebox repairs in 1876, and steampipes replaced. Wheels turned in 1877 and tender wheels replaced, also motion overhauled. In 1878 entered works for replacement of firebox and tubes after 136,000km, also all wheels turned. Late 1882 broke a crank-pin, and had wheels turned. 1883-4 in good condition after general repairs including wheels turned, new blastpipe and chimney, new crankpins and heavy boilerwork. At end of 1883 cyls. were recorded as 17x24", and d/w as 56", ie. as built. Became *EFE 85*.



Rogers builder's photo of no. 18.

4-4-0 d/w 1651mm 65", cyls. 381x609mm 15"x24", supposedly built by Baldwin in 1877, but not traceable in BLW list

These were probably ex *FCCCiT* nos. 21, 22 and 18, which latterly were not shown in *FCCCiT* loco lists. The first note under no. 20 'LIRCAI' referring to its arrival "from the Talca section" tends to support this theory. The only question is, 'Why would one have been renamed when the others retained their original names?' However, at that date all of the *FCS*'s loco names were single word places or phenomena rather than individual persons, so maybe they wanted to maintain that tradition.

20 'LIRCAI' w/n ? Ex *FCCCiT* 21 'FEDERICO ERRÁZURIZ' Baldwin w/n 35??

In June 1875 received from the Talca section. Chimney changed then. In 1876 firebox stays renewed, also tender tyres, new pistons, and brake fitted. Loco then used on Curicó to Talcahuano duties (construction work?) and in 1877 needed much repair, including turning wheels, patching a fault in a cylinder and steam chest, and completely restaying the firebox. However, in 1878 both cylinders replaced owing to cracks. Repairs finished in early 1879 and loco reported at end of that year as working well. In good condition in late 1882. 1883-4 in good bottom end condition but needing a new boiler which was already in stock. At end of 1883 cyls. were recorded as 15x24", and d/w as 65", ie. as built. Became *EFE 68*.

22 'MAULE'

w/n ?

Ex *FCCCiT 22 'MAULE'* Baldwin w/n 3555?

Various firebox repairs needed in 1878 and later in the year a new chimney, also wheels turned. Was trapped south of Río Claro bridge when that collapsed in August 1873, and when returned north at end of 1879 needed complete overhaul. Air brake fitted around that time. In good condition in late 1882. 1883-4 valves overhauled, new bearings for the loco bogie and some boiler work. At end of 1883 cyls. were recorded as 15x24", and d/w as 65", ie. as built. Became *EFE 69*.

23 'LINARES'

w/n ?

Ex *FCCCiT 18 'LINARES'* Baldwin w/n 3520?

New pistons in 1878 and a new chimney, and various other work. Was trapped south of Río Claro bridge when that collapsed in August 1873, and when returned north at end of 1879 needed complete overhaul. Needed firebox stays replacing at same time. Air brake also fitted around that time. In good condition in late 1882, after some tubes replaced. 1883-4 new bogie wheelsets for loco, attention to valves, and a set of brasses for the tender bearings. At end of 1883 cyls. were recorded as 15x24", and d/w as 65", ie. as built. Became *EFE 70*.

4-4-0 d/w 1676mm 66", cyls. 355x609mm 14"x24", built in railway's Santiago shops in 1877

But as seen below is mentioned already in 1875/6 *memoria*.

21 'CLARO'

In late 1882 received new tubes, overhaul of motion and new tender wheels on steel axles. 1883-4 had a loose tyre so wheels removed and tyres turned, also partial motion overhaul at same time. At end of 1883 cyls. were recorded as 14x24", and d/w as 63". Became *EFE 66*.

2-6-0 d/w & cyls. see notes for each loco, built by Baldwin in 1877 (24) and 1882 (25-26).

24 'COLCHAGUA'

w/n ?

d/w 1372mm 54", cyls. 457x609mm 18"x24". This was almost certainly *FCCCiT* no. **23 'TALCA'**, transferred to the *FCS* in early 1876 along with 4-4-0s nos. **18, 20** and **22**. It will have been renamed because *FCS* no. **18** was already named '**TALCA**'. This loco was trapped south of the Río Claro bridge when that collapsed in August 1873, and when returned north at end of 1879 needed complete overhaul. Late 1882 in for general repairs. 1883-4

a general overhaul, loco wheels turned, new left hand piston, new rod brasses, new injectors replacing feed pumps, cylinders reinforced and major boiler work. At end of 1883 cyls. were recorded as 18x24", and d/w as 54", ie. as built. Became *EFE 114*.

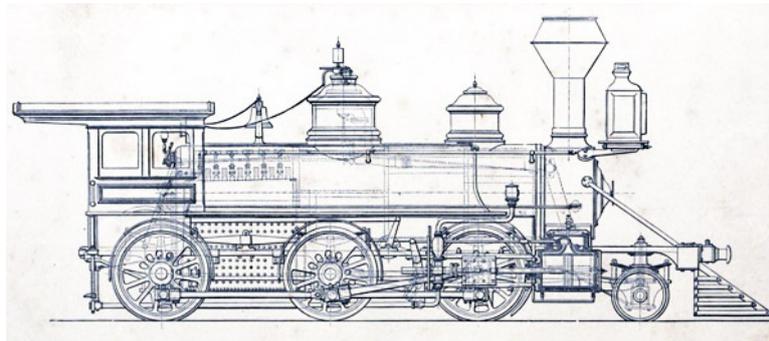
25 'JOSÉ T. de URMENETA' w/n 6039

d/w 1422mm 56", cyls. 457x609mm 18"x24". Received October 1882. 1883 had accident at Chapeton, resulting in general check-over and extensive repairs to 30 separate parts; including new cab and chimney. At end of 1883 cyls. were recorded as 17x24", and d/w as 56". Became *EFE 87*.

26 'CHORILLOS'

w/n 6036

d/w 1422mm 56", cyls. 457x609mm 18"x24". Received November 1882. 1883-4 in good condition but needing some new tubes. At end of 1883 cyls. were recorded as 17x24", and d/w as 56". Became *EFE 88*.



A typical Baldwin 2-6-0 of 1881, as illustrated in that year's catalogue.

This one has a straight-top boiler.

4-4-0 d/w 1651mm 65", cyls. 381x609mm 15"x24", built by Rogers in 1883 ordered for FCCCiT but allocated on arrival to FCS

27 'BUIN'

w/n 3173

Arrived December 1883. 1884 in good condition, and new design of spark arrestor giving good results. At end of 1883 cyls. were recorded as 15x24", and d/w as 65", ie. as built. Became *EFE 71*.

2-6-0 d/w 1422mm 56", cyls. 431x609mm 17"x24", built by Rogers in 1883

28 'La INDUSTRIA'

w/n 3311

Arrived December 1883. 1884 in good condition, and new design of spark arrestor giving good results. Became *EFE 89*.

Additional engines

Other locos may have been transferred in from the *FC Chillán, Concepción i Talcahuano* by the *EFE* and were given numbers below **93** with the other locos of this line. This would explain the duplication of running numbers. [6] suggests this is not quite correct.

However, in the 1878 *Mol memoria* locos **29, 32, 34,** and **41** are listed for this railway. All were having their wheels turned that year. It is probable that these were *FCSV* locos on loan.

1.1.3 *El FC Chillán, Concepción i Talcahuano*

1872?-1884

Background

The company was formed in 1872, though work may have started in 1869. Talcahuano to Chillán was opened in 1872 (the contractor was the American engineer Juan Slater); The Curicó to Chillán link with the *FCS* was completed in 1874, and San Rosendo to Angol and the Santa Fe to Los Angeles branch (the contractor was again Sr. Slater) by 1876, after which there was an eleven year gap before any further extension to the network came to fruition. By 1884 the railway was being described in an *MdI memoria* as the *FCS seccion del Talca al Sur*, and alternatively as the *Ferrocarril de Talca, Talcahuano i Angol*, though the loco numbering system remained as before. Note that the operational boundary between the *FCS* and the *FCCCiT* was set at Talca, partway along that final link between Curicó and Chillán.

Loco numbering and naming

Matching of loco names and numbers is as given in the *MdI memoria anual* for 1884, and is supported by a secondary source [7]. However, it does seem that the original numbering and naming of locos **13-24** may have got mixed up over the years.

2-6-0 d/w 1410mm 55½", cyls. 457x610mm 18"x24", built by Rogers in 1870

Rogers order no. J-687 1, shipped Feb. 1870. Rogers notes in PCD archive include special features as: tubes ferrules–steel, firebox crown–iron.

1 ‘TALCAHUANO’ w/n (1722 in CF list) 1883 boiler and frame patched, new tubes and stays, and a new tender tank. 1884 substantial repairs to boiler and other parts; total kilometreage to date 245,547. Became *EFE* no. **106**. Name written in Rogers documents as ‘TALCAHUANA’ but uncertain as to whether that was a mistake or a genuine contemporary spelling.

4-4-0 d/w 1676mm 66", cyls 16½"x24", built by Rogers in 1870

Rogers order no. J-688 1, shipped Feb. 1870. Rogers notes in PCD archive include special features as: tube ferrules–steel, firebox crown–iron, sliding firedoor.

2 ‘CONCEPCIÓN’ w/n (1721 in CF list) 1883 minor repairs. 1884 repairs to cylinders, valves and pistons, and to frames, also tender wheels turned; total kilometreage to date 245,395. At end of 1883 d/w recorded as 65". Became *EFE* no. **97**.

2-6-0 d/w 1422mm 56", cyls. 419x609mm 16½"x24", built by Rogers in 1871

Rogers order no. J-775 1-3, shipped Jul. 1871. Rogers notes in PCD archive include special features as: firebox crown iron, 1 row hollow staybolts 3" above fire. Drawing generally same as order J-687.

3 ‘HUALQUI’ w/n (1938 in CF list) Minor boiler work in 1883. 1884 all wheels turned and work on cylinders, valves and pistons, new brasses, boiler work, repair to cab and cow-catcher/pilot; total kilometreage to date 202,215. At end of 1883 d/w was recorded as 55 1/3". Became *EFE* no. **94**.

4 ‘TALCAMÁVIDA’ w/n (1939 in CF list) 1884 general overhaul, with new tubes and stays, and boiler now at 180psi, and new driving wheels; later that year all wheels turned and work on cylinders, valves and pistons, new brasses, boiler work, repair to cab and cow-catcher/pilot; total kilometreage to date 267,134, At end of 1883 d/w was recorded as 55 1/3". Became *EFE* no. **95**.

5 'MALVOA'

w/n (1941 in CF list) 1883 various minor repairs. 1884 variety of repairs, total kilometreage to date 282,157. At end of 1883 d/w was recorded as 55 1/3". Became *EFE* no. **96**.

4-4-0 d/w 1676mm 66", cyls. 381x609mm 15"x24", built by Rogers in 1871

Rogers order no. J-774 1-2, shipped Jul. 1871. Rogers notes in PCD archive include special features as: firebox crown iron, one row hollow staybolts 3" above fire.

6 'YUMBEL' or 'FEDERICO ERRÁZURIZ'

1883 general overhaul. 1884 all wheels turned and work w/n (1929 in CF list) on cylinders, valves and pistons, new brasses, boiler work, repair to cab and cow-catcher/pilot, also replacement air pump; total kilometreage to date 320,923. At end of 1883 d/w was recorded as 55". Became *EFE* no. **98**. The 'YUMBEL' name is as given in Rogers loco list, but in 1881 & 1884 was known as 'FEDERICO ERRÁZURIZ'. The guess must be that when no. **21** 'FEDERICO ERRÁZURIZ' was transferred to the *FCS* in 1876 it was felt that the name should be perpetuated and thus no. **6** was renamed.

7 'BULNÉS'

w/n (1932 in CF list) 1883 given a new injector and was lifted for work on axleboxes. 1884 normally used on express trains from Santiago; boiler changed recently for a new one and all wheels also replaced, plus general overhaul of loco and tender including a new air pump; total kilometreage with old boiler approx. 500,000, and kilometreage with new boiler 15,069. At end of 1883 d/w was recorded as 55 1/3". Became *EFE* no. **99**

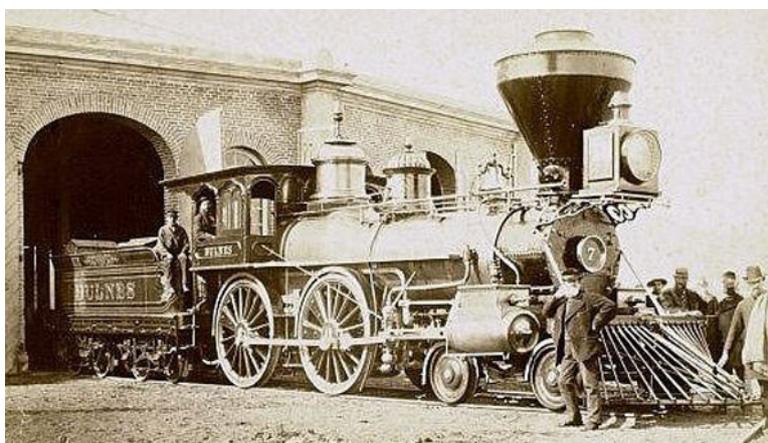


Photo supposedly from Rogers archive, but appears to show loco 'BULNES' at a Chilean roundhouse.

Just three locos were reported in service in 1873 [*Informe del FC entre Chillán i Talcahuano 1873*. in *Biblioteca Nacional*, Santiago].

The 1874 Baldwin locos

The following seventeen BLW locos are first shown on the Baldwin spec sheets as having been ordered by/for 'Ribbon?' and Munoz' (possibly agents/dealers?), later over-written as for the 'Curico and Angol railway'. There were to be eight 2-6-0s and nine 4-4-0s.

<u>Curico and Angol</u>		No.
8/30 D 12,	Parral.	15
" " 13,	Longaví.	16
" " 14,	Los Angeles.	19
" " 15,	Atacama Arauco.	20
" " 16,	Talca.	23
" " 17,	Villa Molina.	24
<hr/>		
F. C. de Chillan Concepcion Talcahuana.		
8/30 D 18,	Chillan.	11
" " 19	Stata.	12
" " 17,	Linares.	14
" " 18,	San Rosendo.	17
" " 19,	Angol.	18
" " 20,	Frederico Errázuriz	21
" " 21,	Maule	22
<hr/>		
F. C. de Chillan, Concepcion Talcahuana		
8/24 C 22,	M. A. Tocornal.	8
" " 23,	Bernardo O'Higgins.	9
" " 24,	Anibal Pinto.	10

The list of loco names that was pinned to the relevant Baldwin loco spec. sheets in vol. 7.

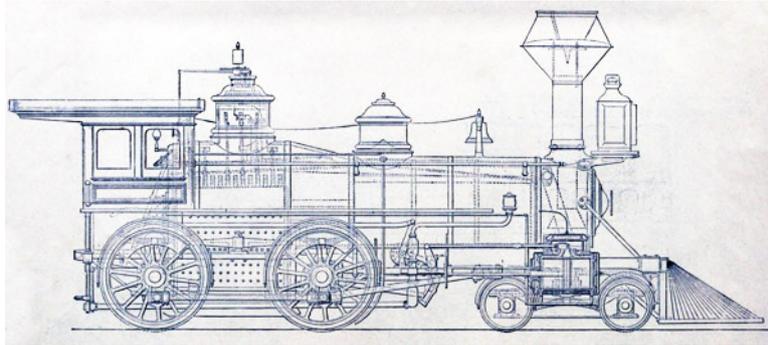
The numbers on the left are the BLW construction nos. in classes 8-30D and 8-24C, whilst those on the right are the railway's running numbers.

4-4-0 d/w 1651mm 65", cyls. 381x609mm 15"x24", built by Baldwin in 1874

These were BLW class 8 24C nos. 22-24. Spec. is in vol. 7 p52. BLW spec book suggests that these three (and the first two 2-6-0s) were initially to be painted as for *FC de C y T*, as opposed to all the others which were to bear the lettering *FC de C y A*.

8 'M. A. TOCORNAL'	w/n 3581	1883 various minor repairs. 1884 similarly a list of minor work done, plus additional items as a result of an accident; total kilometreage to date 359,802. Became <i>EFE 100?</i>
9 'BERNARDO O'HIGGINS'	w/n 3582	1883 cylinders, pistons and valves overhauled; also new drawbar, and cab repaired. 1884 driving and tenders wheels replaced and bogie wheels turned, pistons turned, boiler examined and some stays replaced, frame worked on, bearings replaced, cylinder castings patched, plus additional items as a result of an accident; total kilometreage to date 414,213. Became <i>EFE 101</i>
10 'ANIBAL PINTO'	w/n 3584	1883 partially stripped to change firebox stays, also other minor repairs. 1884 all wheels turned, new brasses for axles and rods, pistons turned and new valve heads, and various other repairs, plus

additional items as a result of an accident; total kilometreage to date 349,323. Became *EFE 102*?



A typical Baldwin 4-4-0 of 1881 as illustrated in that year's catalogue.
This one has a wagon-top boiler.

2-6-0 d/w 1422mm 56" , cyls. 457x609mm 18"x24" , built by Baldwin in 1874

Connelly's BLW list and a note in the Baldwin spec book give the names of this pair in reverse order. These were BLW class 8 30D nos. 18-19. BLW spec book suggests that these two (and the first three 4-4-0s above) were initially to be painted as for *FC de C y T*, as opposed to all the others which were to bear the lettering *FC de C y A*.

- | | | |
|---------------------|----------|---|
| 11 'ITATA' | w/n 3585 | 1883 general repairs including boiler work. 1884 loco stripped for work on frames, light repairs to firebox, some brasses replaced, also some work on motion; total kilometreage to date 214,772. Became <i>EFE 107</i> . |
| 12 'CHILLÁN' | w/n 3586 | 1883 various repairs to cylinders and pistons, etc. 1884 new piston and cylinder end covers, work on axleboxes and motion bearings; total kilometreage to date 193,620. Became <i>EFE 108</i> . |

2-6-0 d/w 1422mm 56" , cyls. 457x609mm 18"x24" , built by Baldwin in 1874

The following locos appear to have been ordered for the Curicó to Angol extension of the *FCCCiT*. This arrangement was something of a prototype for the many later construction contracts involving the purchase of locos, their use during the building of the lines, and their eventual handover with all the other completed assets to the *DOP* and finally to the permanent railway managements. The works numbers listed below without question marks are as explicitly set out in a table in the 1884 *MdI memoria anual*. However, Connelly's BLW list and a note in the Baldwin spec book give the following 2-6-0s: 3533 '**LOS ANJELES**' (running no. **19**), 3534 '**ARAUCO**' (running no. **20**), 3539 '**TALCA**' (running no. **23**), 3556 '**VILLA MOLINA**' (running no. **24**). All of this batch were BLW class 8 30 D nos. 12-17. Ordered by 'Ribon and Munoz' according to the Baldwin erecting card, which also notes that brass crosshead pumps were fitted and a Sellers size 7 injector.

- | | | |
|-----------------------------|-----------|---|
| 15 'LOS ANJELES' | w/n 3538 | 1883 only minor repairs. 1884 new pair of cylinders, all wheels turned, general repairs and a new cab; total kilometreage to date 150,050. Became <i>EFE 109</i> . |
| 16 'FEDERICO ARAUCO' | w/n 3556 | 1878 on hire to Don Juan Slater, contractor between Rio Nuble and Talcahuano. 1883 only minor repairs. 1884 driving wheel bearings replaced and driving and bogie wheels turned; total kilometreage to date 186,266. Became <i>EFE 110</i> . |
| 19 'LONGAVI' | w/n 3522? | Connolly's Baldwin list says that ' LONGAVI ' was a 4-4-0. 1883 partially stripped for work on cylinders etc., also a new cab. 1884 driving wheel bearings replaced and driving and bogie wheels turned; total kilometreage to date 177,183. Became <i>EFE 112</i> . |
| 20 'SAN CARLOS' | w/n 3534 | 1877-8 on hire to Don Juan Slater, contractor between Curicó and |

Angol. 1883 given various new stays, and a patch on a cylinder. 1884 various motion and bearing repairs, also firebox stay repairs; total kilometreage to date 235,296. Became *EFE* **105**. NB [41] shows this loco as 4-coupled in 1883.

- | | | |
|--------------------------|-----------|---|
| 23 'TALCA' | w/n 3539? | Almost certainly transferred to the <i>FCS</i> to become their no. 24 'COLCHAGUA' , in 1876. Became <i>EFE</i> 114 . |
| 24 'VILLA MOLINA' | w/n 3556? | 1883 major repairs particularly to cylinders and motion, also a new cow-catcher/pilot. 1884 various minor repairs; total kilometreage to date 160,372. Became <i>EFE</i> 113 . |

4-4-0 d/w 1676mm 66", cyls. 381x609mm 15"x24", built by Baldwin in 1874

The following locos appear to have been ordered for the Curicó to Angol extension of the *FCCCiT*. This arrangement was something of a prototype for the many later construction contracts involving the purchase of locos, their use during the building of the lines, their eventual handover with all the other completed assets to the *DOP* and finally to the permanent railway managements. The works numbers listed below without question marks are as explicitly set out in a table in the 1884 *MoI memoria anual*. However, Connelly's BLW list gives the following 4-4-0s: 3519 '**SAN CARLOS**', 3520 '**LINARES**', 3521 '**PARRAL**' (running no. **15**), 3522 '**LONGAVI**' (running no. **16**), 3530 '**SAN ROSENDO**', 3532 '**ANGOL**', 3554 '**FEDERICO ERRÁZURIZ**', 3555 '**MAULE**'. All of this batch were BLW class 8 24 C. nos. 16-21. Spec. is in vol. 7 p52.

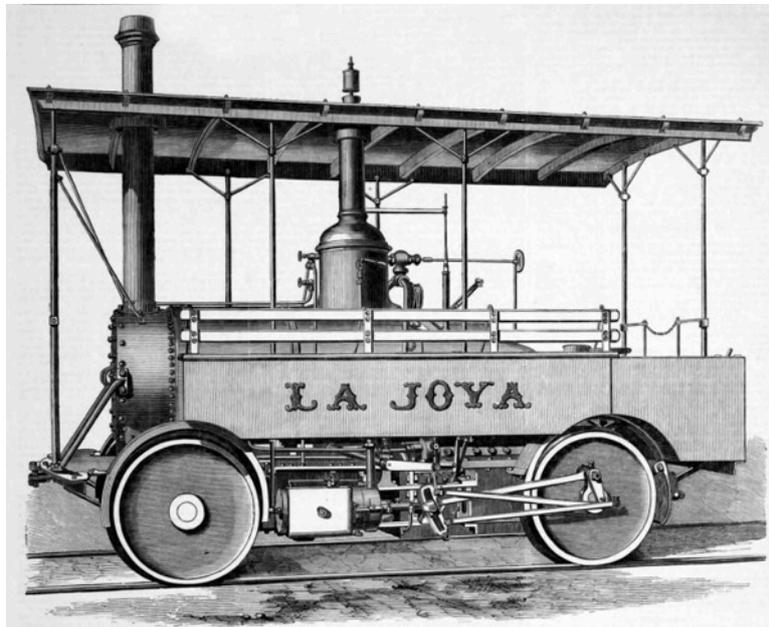
- | | | |
|--------------------------------|-----------|---|
| 13 'SAN ROSENDO' | w/n 3530 | 1878 on hire to Don Juan Slater, contractor between Rio Nuble and Talcahuano. 1883 only minor repairs. 1884 all wheels turned and work on cylinders, valves and pistons, new brasses, boiler work, repair to cab and cow-catcher/pilot, also replacement air pump and attention to boiler; total kilometreage to date 258,812. Became <i>EFE</i> 103 or 105 . |
| 14 'ANGOL' | w/n 3554 | 1884 <i>FCS</i> report in <i>MoI memoria</i> says this loco was returned to Concepción in April (1883?) having received new tender brasses and new loco bogie wheelsets, main report says light repairs to valves, patch on cylinder castings, air brake system repaired, etc.; total kilometreage to date 138,256. Became <i>EFE</i> 104 . |
| 17 'PARRAL' | w/n 3533 | 1883 only minor repairs apart from changing a bogie axle. 1884 various repairs including a new crank-pin(?); total kilometreage to date 151,320. Became <i>EFE</i> 103 or 111 . NB [41] shows this loco as 6-coupled in 1883. |
| 18 'LINARES' | w/n 3520? | Almost certainly transferred to the <i>FCS</i> to become their no. 23 'LINARES' , in 1876. Became <i>EFE</i> 70 . Later had a long career with the <i>DOP</i> . |
| 21 'FEDERICO ERRÁZURIZ' | w/n 35?? | Almost certainly transferred to the <i>FCS</i> to become their no. 20 'LIRCAI' , in 1876. Became <i>EFE</i> 68 . |
| 22 'MAULE' | w/n 3555? | Almost certainly transferred to the <i>FCS</i> to become their no. 22 'MAULE' , in 1876. Became <i>EFE</i> 69 . |

2-2-0T d/w 838mm 33", cyls. 127x305mm 5"x12", built by Rogers in 1/1875

Milholland type boiler. Noted as similar to '**La JOYA**' supplied to the *FC Mejia i Arequipa* in Peru. Rogers order no. J-915 1, shipped in Jan 1875. Rogers had built a number of these 2-2-0T 'steam cars' for the *FC de Copiapó*, the *FC Lima y Huacho* and the Eten railway in both Chile and Peru. They were intended to replace track gangs' hand cars on steeply graded routes.

25 'CABALLEJE' later 'QUILAPAN' w/n 2393

Reported in service in late 1882. Early 1883 received new grate, repairs to cylinders, etc. End of 1883 recorded with the name 'QUILAPAN'. 1884 had been used as additional stationary boiler in works for three months, received some attention to own boiler and wheels turned, then returned to service as steam inspection car ('*palanca a vapor*'); total kilometreage to date 53,769. Became *EFE* 115. Original name may have been 'CABALLAJE'.



This was 'La JOYA' built for the *FC Mejia i Arequipa* in Peru. 'CABALLEJE' or 'QUILAPAN' was of similar dimensions though it had slightly bigger wheels. In later use by the *EFE* it certainly had a more enclosed body but that may not have been original. The layout enabled up ten workers to sit facing inward along the tops of the tanks.

Puzzles

In the 1884 *MoI memoria* there was also a reference to a loco 'CHILENITA'. This might have been either *FCS* 2-6-0 (ex 0-6-0) loco. 13 'CHILENA' or *FCSV* 0-4-4T loco no. 57 'CHILENA', on loan and referred to colloquially in the diminutive.

What was *FCCCiT* no. 26? No. 25 is listed above, and no. 27 below, but there is no sign of a number 26.

2-6-0 d/w 1372mm 54", cyls. 432x609mm 17"x24", built by Baldwin in 1882 "for the *FFCC del Estado de Chile*"

This batch became *EFE* 87, 88, 93 and 119, but in unknown order. NB The *FCCCiT* loco list for the end of 1883 gives the d/w for nos. 27 and 28 as 57". However, this may be an error. BLW class 8-28D nos. 47-50. Spec. is in vol. 11 p 15.

(25 'JOSÉ T. URMENETA' w/n 6039

1883 On arrival allocated to *FCS* and numbered in that series, see that list, above.)

(26 'CHORILLOS' w/n 6036

1883 On arrival allocated to *FCS* and numbered in that series, see that list, above.)

27 'MIRAFLORES' w/n 6040

Into service late 1882 according to *MoI memoria* report from Feb. 1883 (?). 1884 dismantled to repair damage caused by collision with *FCS* no.10 'RELÁMPAGO', bogie also needed attention, and a new cow-catcher/pilot and front lamp were provided; total kilometreage to

28 'LIMA' w/n 6041 date 37,070. Became *EFE* 119.
 Into service late 1882 according to *MoI memoria* report from Feb. 1883 (?). 1884 only minor work needed as is in perfect new condition; total kilometreage to date 45,730. Became *EFE* 93.

4-4-0 d/w 1676mm 66", 381x609mm 15"x24", built by Rogers in early 1883

Rogers order no. J-1150 1-4, shipped Jan 1883. Rogers notes in PCD archive include special features as: staybolts of iron, two pumps no injector. All four were lost at sea. The circumstances are unknown as the usual lists of wrecks contain no obvious culprits. A search of *Lloyds List* for January to March 1883 has not revealed any possibilities.

27 'TACNA' w/n 3171
 28 'ARICA' w/n 3172
 29 'BUIN' w/n 3173
 30 'LINDEROS' w/n 3174

Difficulties in identification

Duplicate numbers and names in the Rogers list have caused considerable confusion when looking at the final locos built for the *FCCCiT*. This has been compounded by the *FCS* and *FCCCiT* each having reached running numbers around 25 and their fleets effectively coming under a single management at that time. It would appear that when the four locos immediately above were lost at sea, a replacement set of four were added to Rogers' order book queue with the same running numbers and names. However, in the meantime eight more Rogers locos arrived in Chile, one of which was numbered and named *FCS* 2 'VARAS' to replace the original which had been withdrawn, and seven which were numbered from 27 upward. Although apparently ordered for the *FCCCiT* they seem on arrival to have been divided between this line and the *FCS*, and some may be renumbered straight into the new *EFE* number series.

4-4-0 d/w 1676mm 66", 381x609mm 15"x24", built by Rogers in mid 1883

Rogers order no. J-1150 5-11, shipped July 1883 (5), Dec 1883 (6-9), April 1884 (10-11). Rogers notes in PCD archive include special features as: extended smokebox, two injectors and one pump, grate bars plain (of) wrought iron with no drop plate, piston and valve rods (to have) US metallic packing, conical smokestack with detachable bonnet.

[5] 27 'BUIN' w/n 3309 On arrival allocated to *FCS*, see that list, above. Connelly's Rogers list says this was an 0-6-0, but was a mistake. It seems unlikely that an 0-6-0 would have had d/w 66". Became *EFE* 71.

Rogers J-1150 6-9 were built in late 1883 as replacements for those lost at sea. The original numbers and names are as shown in the Rogers list, but by the time they arrived in Chile those numbers and at least one of the names had been re-allocated so they will have received different designations. They probably gained their new *EFE* numbers immediately on arrival. There seems to have been an earlier *FCS* Hawthorn 0-6-0 (later 2-6-0) which was renamed 'LINDEROS' at the 1884 grouping, which may explain the change of name in one case.

[6] (27 'TACNA') w/n 3441 Became *EFE* 72 'TACNA'.
 [7] (28 'ARICA') w/n 3442 Became *EFE* 73 'ARICA'.
 [8] (29 'BUIN') w/n 3443 Became *EFE* 74 'DOMINGO SANTA MARÍA'.
 [9] (30 'LINDEROS') w/n 3444 Became *EFE* 75 'J. J. PERÉZ'.

Rogers J-1150 10-11 were ordered in Feb 1884 for the extension works southward to Victoria and Traiguén, see the following page.

[10] w/n 3473 Ordered for construction of *FCCCiT* extensions to Victoria and
 [11] w/n 3474 Ditto Traiguén, see following page.

2-6-0 d/w 1422mm 57 5/8", cyls. 432x609mm 17"x24", built by Rogers in 1883

Rogers order no. J-1159 1, shipped Feb 1883. Rogers notes in PCD archive include special features as: iron staybolts – one row hollow staybolts [at] sides, two rows hollow staybolts [at] back, two pumps no injector.

2 'VARAS' w/n 3204 Allocated to *FCS* to replace original no. **2** which had earlier been withdrawn from service. See above. Note b

2-6-0 d/w 1422mm 57 5/8", cyls. 432x609mm 17x24", built by Rogers in 1883-4

Rogers order no. J-1159 2-12, shipped July 1883 (2-5), Nov 1883 (6-7), May 1884 (8-12). Rogers notes in PCD archive include special features as: Conical smokestack with detachable hood, piston and valve rods (to have) US metallic packing, hollow stays (on 2-5) but without hollow staybolts (6-12), extended smokebox, grate (to be) plain wrought iron, no dump grate, 2 injectors, one pump.

- | | | | |
|------|---------------------------|----------|--|
| [2] | 28 'LA INDUSTRIA' | w/n 3311 | On arrival allocated to <i>FCS</i> , see that list, above. Became <i>EFE</i> 89 |
| [3] | 29 | w/n 3313 | Possibly renumbered 31 on arrival Note b |
| [4] | 30 'SAN FRANCISCO' | w/n 3314 | Became <i>EFE</i> 90 |
| [5] | 31 | w/n 3315 | Possibly renumbered 32 on arrival Note b |
| [6] | ? | w/n 3401 | Possibly used by <i>DOP</i> , later becoming <i>EFE</i> 91 or 116 . |
| [7] | ? | w/n 3405 | Possibly used by <i>DOP</i> , later becoming <i>EFE</i> 91 or 116 . |
| [8] | | w/n 3475 | Ordered for construction of <i>FCCCiT</i> extensions to Victoria and |
| [9] | | w/n 3476 | Ditto Traiguén, see following page. |
| [10] | | w/n 3479 | Ditto |
| [11] | | w/n 3480 | Ditto |
| [12] | | w/n 3481 | Ditto |

Note b Became *EFE* **81, 86** and **105** in unknown order.

The notes about Rogers locos supplied by ALCo to P. C. Dewhurst in 1920s? give the following names and numbers for these locos: “**‘BUIN’27, ‘ESPERANZA’ 3, ‘ILUSTRACION’ 4, ‘CONSTANCIA’ 10, ‘ARTESANO’ 11, ‘IN-MIGRANTE’ 11, ‘SAN FRANCISCO’ 30,** 4 to 7 no number or name.” This is not very helpful!

0-6-0ST d/w 1270mm 50", cyls. 355x559mm 14"x22", built by Rogers in 1884

Rogers order no. J-1195 1, shipped Jan 1884. Rogers notes in PCD archive include special features as: no pump, grate [to have] plain bars [of] cast iron, staybolts of steel.

- | | | |
|-----------------------|----------|--|
| ? 'CUNACO' (?) | w/n 3446 | Became <i>EFE</i> 92 . Name ‘CUNACO’ is as allocated under the <i>EFE</i> , but may have been chosen by the <i>FCCCiT</i> before the grouping took effect. This engine may well have been the prototype for the later <i>EFE tipo 22</i> saddle tanks. |
|-----------------------|----------|--|

The fleet at the time of the grouping

It will be obvious that a number of Rogers locos arrived in Chile at around the time of the formation of the *EFE* in January 1884. It may be wondered what numbers and names those engines received before they were renumbered into the new *EFE* list. Fortunately Oleachea in his 19?? volume [41], gives a clear list of the *FCCCiT* fleet on 31st December 1883, from which it is obvious that only locos **1-17, 19-20, 24-25,** and **27-28** were in use. Nos. **18** and **21-23** had, of course been transferred to the *FCS*, and

1.1.4 FCCCiT Renaico-Victoria and Angol-Traiguén extensions contracts

188?-1888

Background

The engines listed below were ordered for the construction and operation of the above-named lines of the FCCCiT, and were then absorbed by the EFE on the premature liquidation of the construction contracts in 1888. Three of these engines had been available latterly for the initial service trains on these sections, whilst the remainder had continued to be used by the contractor *Mayers y Hillman* [*DOP memoria* 1888]. One of the latter locos was to have been shipped by road to the south side of the Malleco viaduct site during March 1888, but this was delayed by bad weather and the state of the road. NB The attribution elsewhere of these locos to a so-called Talca-Talcahuano railway is incorrect. There was probably no such entity.

4-4-0 d/w 1676mm 66", cyls. 381x559mm 15"x22", built by Rogers in 1884

Part of Rogers order J-1150 (10-11), see above.

1 'ARAUCANA'	w/n 3473	Became <i>EFE</i> 132
2 'GUANACO'	w/n 3474	Became <i>EFE</i> 133

2-6-0 d/w 1422mm 56", cyls. 432x609mm 17"x24", built by Rogers in 1884

Part of Rogers order J-1159 (8-12), see above.

3 'ESPERANZA'	w/n 3475	Became <i>EFE</i> 134
4 'ILUSTRACIÓN'	w/n 3476	Became <i>EFE</i> 135
5 'CONSTANCIA'	w/n 3479	Became <i>EFE</i> 136
6 'ARTESANO'	w/n 3480	Became <i>EFE</i> 137
7 'INMIGRANTE'	w/n 3481	Became <i>EFE</i> 138

According to Copeland & Kirchner some lists show Rogers 3479-3481 as nos. **10-12** but this is an error probably caused by ALCo staff misreading the order numbers as running numbers in their answer to P. C. Dewhurst's enquiry. See previous page. Connelly's Rogers list shows all locos as if for *FC Chillán, Concepción i Talcahuano*, nos. **1-7**, with the names as above.

1.2.1 *La Empresa de los FFCC del Estado (EFE)*

1884 to date

Background and initial *EFE* loco numbering

The three railways owned by the state, the *Santiago a Valparaíso*, the Southern, and the *Chillan, Concepción i Talcahuano*, were united in 1884. The decision came about not least because their mutual cooperation during the War of the Pacific had been less than impressive. In readiness for the reorganisation the new *EFE* numbered the locos in a common system:

<i>FC Santiago a Valparaíso</i>	nos. 1-60 , ie generally retaining their original numbers.
<i>FC del Sur</i>	nos. 61-92
<i>FC Chillan, Concepcion i Talcahuano</i>	nos. 93-114

New deliveries then started at **126**, the gap from **115** to **125** being filled with odd and worn out locomotives. The *FC-CCiT*'s Renaico to Victoria and Angol to Traiguén extensions were taken from the contractors and brought 'in house' during 1888, and nos. **132-138** were assigned to the locos that had been working on construction trains and hauling the first provisional public services there.

Years of accession

From this point onward large grey numerals in the background indicate the year in which locos joined the *EFE* fleet. Given that the list is in year of accession order rather than strict numerical order, this should help readers to navigate around the pages.

Classes or '*tipos*'

Note also that the use of the word '*tipo*' (= English 'type'), to designate a loco class, only became standard on the *EFE* around 1921. However, it has been used here as a header for each group of locos to assist in navigation. It should be noted that the earlier – lower number – *tipos* sometimes included locos of varying dimensions as long as the general nature of them was similar within a group. Each batch of locos is headed by "*Tipo xx*" at top left, but also at top right there is usually bracketed text indicating which batch it is within that *tipo*, and whether there are further batches to be met later on: eg. '1st batch +', '2nd batch +', '3rd & last batch'; or maybe '1st & only batch'.

Operating divisions

The *Red Sur* was divided for operating purposes into several *Zonas* by *Decreto 396* of 8th February 1888. These were as follows:

Zona I, "*De Valparaíso hasta la ribera norte del Mapocho*"; roughly the old *FCSV* between Santiago and Valparaíso, with main workshops at Maestranza Barón in Valparaíso and a largely metre gauge offshoot at La Calera.

Zona II, "*De Santiago a Talca inclusive*"; roughly the old *FC del Sur*, between Santiago and Talca, with its main workshops at Maestranza San Eugenio.

Zona III, "*De Talca exclusive hasta Collipulli*"; originally roughly the old *FCCCiT*, with its main workshops at Maestranza Concepción.

Branches were allocated to each of these zones depending on which of the above sections contained the junction with the mainline.

Zona IV was created later to cover the expanding network south of Victoria, with its main workshops at Maestranza Valdivia, but in 1927 was merged into *Zona III*. In fact the possibility of moving the Valdivia workshops to Concepción was being discussed in detail as early as 1915 but a decision was postponed owing to the hardship it would cause to workers.

Loco lists in the 1939, 1941 and 1942 working timetables and for 1952 and 1955 show loco numbers under the headings of 'Barón y Calera' or merely 'Barón', 'San Eugenio', 'Concepción' and 'San Bernardo'. These more or less correspond to the main works for *Zonas I, II, III*, and the MSB works shunters, the separate *Zona IV* based on Valdivia having disappeared by then. However, in this document the phrasing used is "Listed under *Zona* (number) (M...) in

(year)” with the works abbreviated to (MByC), (MSE), (MC), or (MV). Including the works abbreviation helps to minimise the risk of mistakes that might occur if only a number was given.

Ex FC de Santiago a Valparaiso locos:

Tipo 1

4-4-0 d/w 1473mm 58", cyls. 419x609mm 16½"x24", built by Hawthorn of Leith in 1855 as an 0-4-2

1 ‘EMPRESA’ w/n ? ex FCSV no. **1**. New boiler 1896, and tender rebuilt. Withdrawn 1922 [30]. Loco with this number in course of dismantling 1923 [3].
 1 loco in class, **1**, in 1902 [19], listed as ‘maniobras’, with rebuild date given as 1879. Listed in Post-1908 diagram book [24].

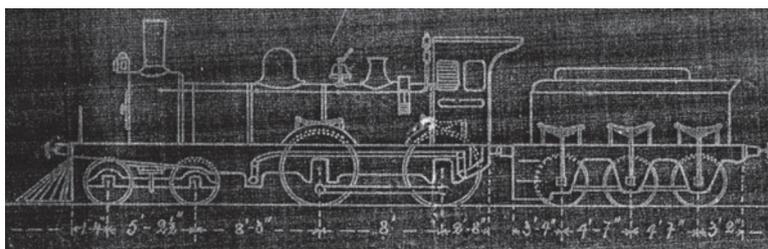


Image from undated diagram book by courtesy of Señor Pablo Moraga.

Tipo 2

0-4-2 d/w 1524mm 60", cyls. 381x559mm 15"x22", built by Hawthorn of Leith in 1855

2 ‘VENCEDORA’ w/n ? ex FCSV no. **2**. New cyls. fitted 1896, when supposedly working in 2nd section (?). Withdrawn 1918 [30]. [Diagram book annotation] says was built 1854.
3¹ ‘OBSTÁCULOS’ w/n ? ex FCSV no. **3**. Withdrawn 1914 [Diagram book annotation].
 2 locos in class, **2-3**, in 1902 [19], listed as ‘maniobras’. Both listed in Post-1908 diagram book [24].
The number 3 was reused in 1914 for a new tipo 57 2-6-0 loco. See below.

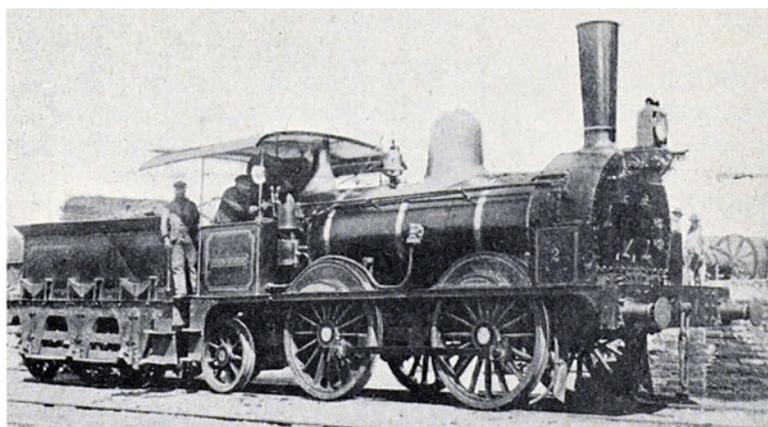


Photo from the *Railway Magazine* February 1908. Loco is no. **2**. Note that the sandboxes ahead of the front splashers were not original, and that they had grown larger as time went on.

Tipo 3

4-4-0 d/w 1524mm 60", cyls. 381x609mm 15"x24", built by Hawthorn of Leith in 1855 as 0-4-2s

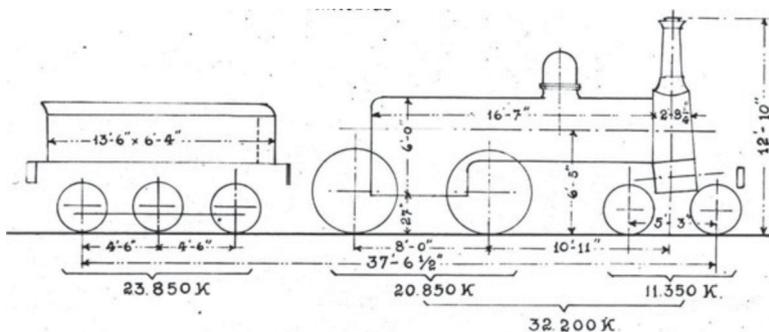
4 ‘ADELANTE’ w/n ? ex FCSV no. **4**. Reconstructed 1897, including boiler rebuild, new cylinders, and tender reconstruction, and air brake fitted. Loco of

this

number and name in use by *DOP* on Cajón to Llaima in 1912 and 1914, but described as a 2-6-0 [2]. On hire to *DOP* in 1920 [*EFE memoria* 1920 p323].

5 'RECOMPENSA' w/n ? ex *FCSV* no. **5**. Loco with this number recorded as '*detenidas*' at *MSB* during 1923 [3], but alternatively withdrawn 1914 [30].

1 loco in class, **4**, in 1902 [19], listed as '*maniobras*', with rebuild date given as 1873. On a separate line: 1 loco in class, **5**, in 1902 [19], listed as '*maniobras*', with rebuild date given as 1873. Both listed in Post-1908 diagram book [24].



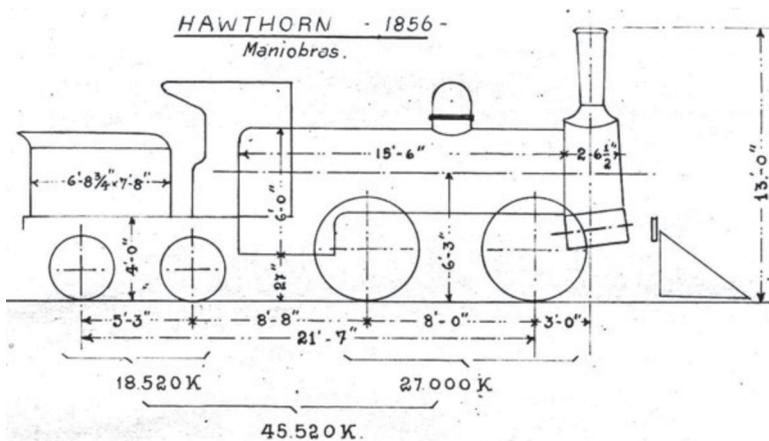
Sketch is from post-1908 *EFE* diagram book, in the SLS library file LD1896.

Tipo 4

0-4-4T d/w 1524mm 60", cyls. 419x609mm 16½"x24", built by Hawthorn of Leith in 1855 as an 0-4-2

6 'PORVENIR' w/n ? ex *FCSV* no. **6**. Reconstructed tender 1892. An undated diagram book page gives d/w as 59".

1 loco in class, **6**, in 1902 [19], listed as '*maniobras*', with rebuild date given as 1883. Locos **6** and **57** listed in Post-1908 diagram book [24]. [52] quotes a 1925 *EFE* list as saying this was latterly an 0-4-4T. 1 Hawthorn 0-4-0 (?) with 60" d/w and cyls. 419x610mm was shown in fleet around 1928 [36], though as 'obsolete or knocked-down'; this might have been from *tipo* 4.



Sketch is from post-1908 *EFE* diagram book, in the SLS library file LD1896.

Tipo 5

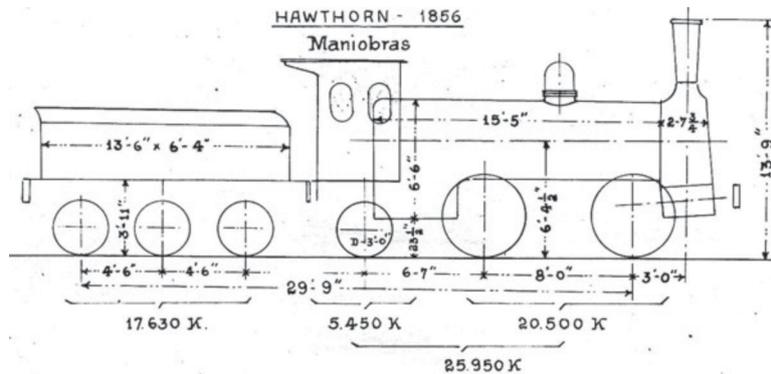
0-4-2 d/w see each loco, cyls. 419x609mm 16½"x24", built by Hawthorn of Leith in 1855-6

7 'VALPARAÍSO' w/n ? d/w 1524mm 60". ex *FCSV* no. **7**. An undated diagram shows this loco with d/w 54". Withdrawn 1918 [30].

10 'SANTIAGO' w/n ? d/w 1372mm 54". ex *FCSV* no. **10**. PCD annotation on diagram book page says that no. **10** made the record-holding trip from Santiago to Valparaiso in 1879 with the Peruvian minister on board

at the outbreak of war, taking 2 hours 40 minutes for the journey. Boiler rebuilt 1896. PCD also notes cylinders replaced by ones having 18" diameter. Withdrawn 1918 [30].

2 locos in class, **7, 10**, in 1902 [19], listed as 'maniobras', with d/w given as 53". Both listed in Post-1908 diagram book [24].



Sketch is from post-1908 EFE diagram book, in the SLS library file LD1896.

Tipo 6

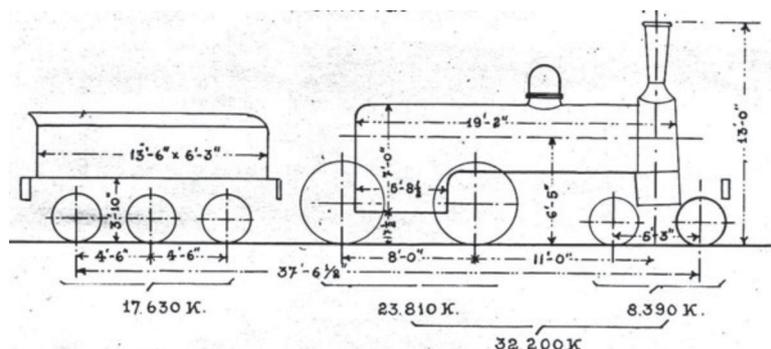
4-4-0 d/w 1676mm 66", cyls. 457x609mm 18" x24", built by Hawthorn of Leith in 1855 as 0-4-2 8 'QUILLOTA' w/n ? ex FCSV no. 8. Cylinders rebored 1889 [29]. Reconditioned boiler fitted 1892. New boiler 1897. To be withdrawn in 1921 [EFE memoria 1920 p323]

1 loco in class, **8**, in 1902 [19], but listed as having been built in 1880. Locomotives **8, 17-19, 23-34, 36-37** listed in Post-1908 diagram book [24] as one class though with varying wheel sizes. 1 Hawthorn-Slaughter 4-4-0 was still listed around 1928 [36] but as 'obsolete or knocked-down'.

Tipo 7

4-4-0 d/w 1524mm 60", 419x609mm 16½" x24", built by Hawthorn of Leith in 1855 as an 0-4-2 9 'ACONCAGUA' w/n ? ex FCSV no. 9.

1 loco in class, **9**, in 1902 [19], listed as 'maniobras', with rebuild date given as 1873. Listed in Post-1908 diagram book [24]. Source [30] says scrapped in Zona I during 1914.



Sketch is from post-1908 EFE diagram book, in the SLS library file LD1896.



Photo by P. C. Dewhurst, possibly just before the First World War.

Numbers 8-10 may have been reused later for locally-built tipo 57 locos, but not until very late. See below.

Tipo 8

4-6-0 d/w 1220mm 48", cyls. 470x609mm 18½"x24", built by Slaughter Gruning in 1863

Purchased for the El Tabón incline section. Source [13] says originally built for India.

11¹ 'COLINA'	w/n ?	Tender rebuilt 1896. Overhauled 1902 [27].
12¹ 'LAMPA'	w/n ?	New cylinders 1896.
13¹ 'TIL-TIL'	w/n ?	Involved in collision on April 25th 1894 when locos 13 and 179 collided with <i>tren ordinario de pasajeros</i> no. 6 standing still near Los Loros [61]. Five dead. Boiler replaced 1911 [27].

3 locos in class, **11-13**, in 1902 [19], listed as 'gradiente excepcional'. Listed in Post-1908 diagram book [24].

Numbers **11-13** were reused for new tipo 57 locos in 1914. See below.

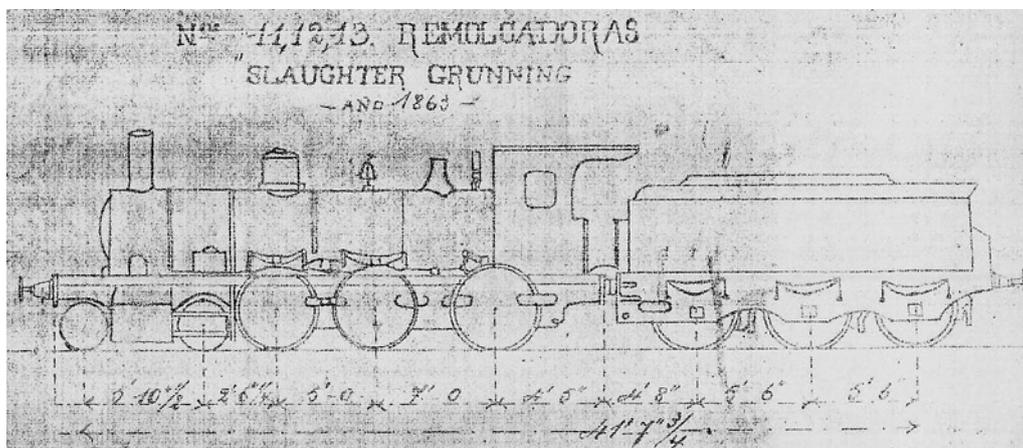


Image from an undated blueprint diagram book by courtesy of Señor Pablo Moraga.

The cab certainly appears very different from the original open-sided GPR-style.

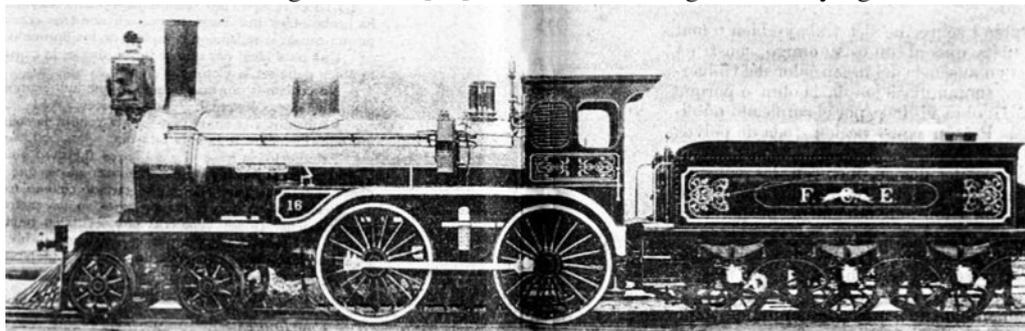
The tenders also seem to have reverted to a 6-wheeled design, from the bogie version illustrated on page 7.

Tipo 9

4-4-0 d/w 1422mm 56", cyls. 419x609mm 16½"x24", built by Slaughter Gruning in 1863

14 'MAPOCHO'	w/n ?	Outside cylinders. New boiler in 1888 [28]. 1902 list says d/w 57". Withdrawn 1914 [30].
15 'RENCA'	w/n ?	Reconditioned boiler fitted 1892, also new tender. 1902 list says d/w 58".
16 'CHACABUCO'	w/n ?	Source [1] says loco was totally rebuilt at Valparaiso workshops in 1894, with 3 axle tender and total weight of 64000kg. To be withdrawn in 1921 [EFE memoria 1920 p323]

1 loco in class, **16**, in 1902 [19]. On a separate line: 1 loco in class, **15**, in 1902 [19], listed as '*de carga, livianos*'. On a separate line: 1 loco in class, **14**, in 1902 [19], listed as '*de carga, livianos*', and with d/w given as 57". Locos **14-16, 21, 38-56** listed in Post-1908 diagram book [24], as one class though with varying wheel sizes.



No. **16** as seen in 1894, presumably after its major rebuild.

Tipo 6

4-4-0 d/w see each loco, cyls. 457x609mm 18" x24", built by Slaughter Gruning in 1863 as 0-4-2s

17 'El TABÓN' later '**TABÓN**' w/n ? d/w 1524mm 60". New boiler in 1888 [28]. Cylinders replaced that year. Reconditioned boiler fitted 1892, also new tender. Tender reconstructed 1897. 1902 list says cyls. 16½". Boiler exploded at Valparaiso in late April 1903, on Sunday morning prior to usual trip to Quilpue. Both crew injured but not killed [report in *Sucesos* issue 35]. Withdrawn 1919 [30] from *Zona I*, or to be withdrawn in 1921 [*EFE memoria* 1920 p323]

18¹ 'BATUCO' w/n ? d/w 1676mm 66". Reconditioned boiler fitted 1892.

19 'SAN RAMÓN' w/n ? d/w 1524mm 60". 1902 list says cyls. 16½". Withdrawn 1924 [30] from *Zona I*.

1 loco in class, **18**, in 1902 [19], but building date given as 1866. On a separate line: 2 locos in class, **17 & 19**, in 1902 [19], listed as '*ordinarios, lentos*', and cyls. given as 16½" x24". Locos **8, 17-19, 23-34, 36-37** listed in Post-1908 diagram book [24], as one class though with varying wheel sizes. A category for Slaughter 4-4-0 locos with 66" wheels and cyls. 457x610mm was still shown in list around 1930 [36] but no locos still in fleet, so last one had probably been withdrawn shortly before that. 1 Hawthorn-Slaughter 4-4-0 was still listed around 1928 [36] but as '*obsolete or knocked-down*'.

Number **18** was reused for the new tipo 59 compound 4-6-0 loco in 1909. See below.

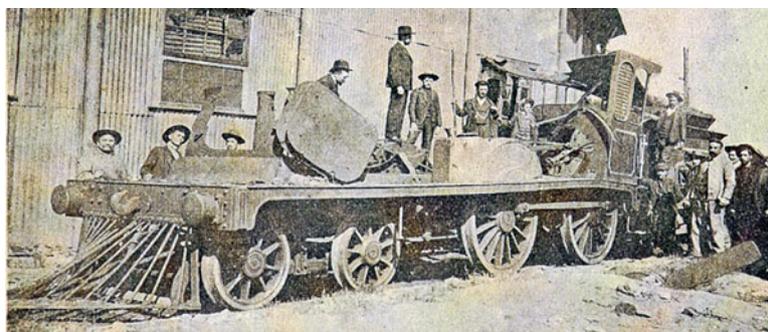


Photo from *Sucesos* issue 35 showing no. **17** after boiler explosion in 1903.

Tipo 10

0-4-2 d/w 1422mm 56", cyls. 457x609mm 18" x24", built by Slaughter Gruning in 1866

20 'SAN PEDRO' w/n 617 Tender reconstructed 1897. Withdrawn in 1920 [*EFE memoria* 1920 p323].

22 'PASO HONDO' w/n 619

1 loco in class, **20**, in 1902 [19], listed as ‘*maniobras*’, d/w given as 59" and cyls. as 16½"x24". On a separate line: 1 loco in class, **22**, in 1902 [19], listed as ‘*maniobras*’, d/w given as 54" and cyls. as 16½"x24". Locos **22, 22, 35** listed in Post-1908 diagram book [24].

The number 22 was reused in 1914 for a new tipo 57 2-6-0 loco. See below.

Tipo 6

4-4-0 d/w 1676mm 66", cyls. 419x609mm 16½"x24", built by Slaughter Gruning in 1866

Arturo Squire said this had originally been an 0-4-2.

21 ‘LEBU’ w/n 618 Loco with this number in course of dismantling 1923 [3].

1 loco in class, **21**, in 1902 [19]. Locos **14-16, 21, 38-56** listed in Post-1908 diagram book [24], as one class though with varying wheel sizes. NB Was this loco in *tipo 6* or in *tipo 9*?

Tipo 6

4-4-0 d/w see each loco, cyls. 419x609mm 16½"x24", built by Hawthorn of Leith in 1868

23 ‘LAI LLAI’ w/n 386 d/w 1524mm 60". Withdrawn 1918 [30] from *Zona 1*.

24 ‘Los MAQUIS’ w/n 400? d/w 1372mm 54". or possibly 1524mm 60". 1902 list says d/w 54". New boiler in 1892 [*DOP memoria* 1892B] when in service in *Zona 1*, also new tender.

Withdrawn 1918 [30] from *Zona 2*, at which time d/w were 56".

25 ‘VICHICULÉN w/n 388 d/w 1676mm 66"., but 1902 list has footnote saying d/w 68".

26 ‘RABUCO’ w/n 389 d/w 1524mm 60".Cylinders rebored 1889 [29]. Withdrawn 1916 [30] from *Zona 1*.

27 ‘ARANDA’ w/n 390 d/w 1524mm 60". Boiler replaced 1888 [28], also cylinders replaced. New boiler in 1892 [*DOP memoria* 1892B] when in service in Section 1. Had 66" d/w in 1902. Had highest mileage of all locos in *Zona 1* during 1907 (92, 342km) [41, p122]. Withdrawn 1918 [30] from *Zona 1*.

28 ‘LIMACHE’ w/n 391 d/w 1524mm 60". Cylinders rebored 1888 [28]. Major overhaul 1896, and new tender, also air brake fitted. Had 66" d/w in 1902. Withdrawn 1919 [30] from *Zona 2*.

29 ‘VIÑA del MAR’ w/n 395 d/w 1524mm 60". Withdrawn 1918 [30] from *Zona 1*.

30 ‘QUILPUÉ’ w/n 396 d/w 1676mm 66", but source [7a] says driving wheels were 60". Major overhaul 1896, and boiler rebuilt, also air brake fitted, also new cylinders fitted. Had 66" d/w in 1902. *Decreto* 1962 of August 5th 1908 authorised the expenditure of \$10,000 on a new boiler and firebox for a loco no. **30**, but it seems unlikely to have been this engine. Ran 70,000km in 1896. Withdrawn 1914 [30] from *Zona 1*, when d/w were 66".

31 ‘PEÑA BLANCA’ w/n 397 d/w 1372mm 54". Source [30] says d/w 56". 1902 list says d/w 54". Loco with this number dismantled 1923 [3].

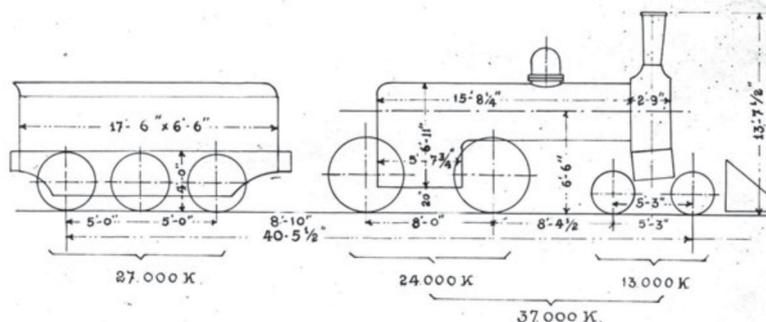
32 ‘La CALERA’ w/n 398 d/w 1372mm 54". Cylinders replaced in 1888 [28]. New tender 1889 [29]. Tender reconstructed 1897-8. Source [30] says d/w 56". 1902 list says d/w 54". Loco with this number in course of dismantling 1923 [3].

33 ‘OCA’ w/n 399 d/w 1524mm 60". Cylinders rebored 1888 [28]. Withdrawn 1920 [30] from *Zona 1*, or to be withdrawn in 1921 [*EFE memoria* 1920 p323]

34 ‘MONTENEGRO’ w/n 387 d/w 1524mm 60". New cylinders 1897. Withdrawn 1921 [30] and

scrapped at MSB.

2 locos in class, **27-28**, in 1902 [19]. A separate line gives: 1 loco in class, **30**, in 1902 [19]. On a separate line: 5 locos in class, **23, 26, 29, 33 and 34**, in 1902 [19], listed as '*ordinarios, lentos*'. On a separate line: 1 loco in class, **25**, in 1902 [19], listed as '*ordinarios, lentos*', and with d/w given as 68" and cyls. 17½"x24". On a separate line: 1 loco in class, **24**, in 1902 [19], listed as '*de carga, livianos*', with d/w given as 54" and cyls. 17½"x24". On a separate line: 3 locos in class, **31, 32, 37**, in 1902 [19], listed as '*de carga, livianos*', with d/w given as 54" and cyls. 17½"x24". Locomotives **8, 17-19, 23-34, 36-37** listed in Post-1908 diagram book [24], as one class though with varying wheel sizes. Undated diagram book shows locomotives **16, 19, 23, 25-29, 30, 33 & 34** as *pasajeros*, and **24, 31, 32, 36, 37 & 38** as *carga*, and gives d/w of *pasajeros* as 62.5" and *expresos* as 68 3/16", with cyls. of all shown as 18x24".



Sketch is from post-1908 EFE diagram book, in the SLS library file LD1896.

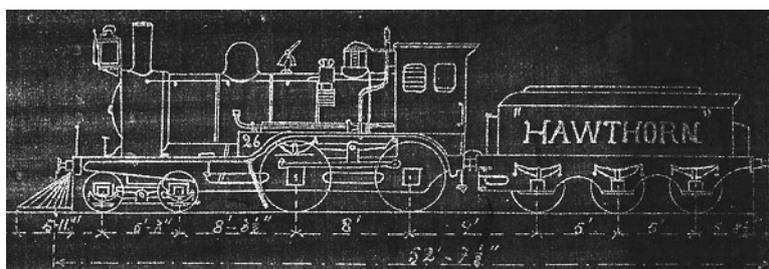


Image from undated diagram book by courtesy of Señor Pablo Moraga.

Tipo 10

0-4-2 d/w 1422mm 56", cyls. 457x609mm 18"x24", built by FCSV's Valparaiso shops in 1872

Source [13] gives Hawthorn number 425 for this loco.

35 'ESPOSICIÓN'

Confirmed by [1], with 3 axle tender and all up weight of 62164kg. Reconditioned boiler fitted 1892, and new cylinders. Withdrawn 1919 [30].

1 loco in class, **35**, in 1902 [19], listed as '*maniobras*', with d/w given as 53". Locomotives **22, 22, 35** listed in Post-1908 diagram book [24].

Tipo 6

4-4-0 d/w 1372mm 54", cyls. 457x609mm 18"x24", built at FCSV's Valparaiso shops in 1872

Built from spares.

36 'PORTEÑA'

Confirmed by [1], with 3 axle tender and all up weight of 64000kg. Boiler replaced 1888 [28]. Cylinders rebored 1889 [29]. Withdrawn 1918 [30] from *Zona 1*, when d/w listed as 56".

37 'Los ANDES'

[52] gives this running no. as Hawthorn 425. Air brake fitted 1892. Source [30] says d/w were 56". 1902 list says d/w 54". Locomotive with this number in course of dismantling 1923 [3].

1 loco in class, **36**, in 1902 [19], listed as '*de carga, livianos*'. Locomotives **8, 17-19, 23-28, 34, 36-37** listed in Post-1908 diagram book [24], as one class though with varying wheel sizes.

Tipo 9

4-4-0 d/w 1422mm 56", cyls. 419x609mm 16½"x24", built by FCSV's Valparaiso shops in 1872

Arturo Squire speculated in the 1920s that this might originally have been a Hawthorn engine, but possibly was scrapped and replaced by a new loco erected from Avonside spares.

38 'SAN FELIPE' Boiler rebuilt 1896. Withdrawn 1921 [30].

11 locos in class, **38, 39, 41, 43, 44, 46, 47, 49, 51, 55, 56**, in 1902 [19], listed as '*de carga, livianos*'. Locos **14-16, 21, 38-56** listed in Post-1908 diagram book [24], as one class though with varying wheel sizes.

Tipo 9

4-4-0 d/w 1422mm 56", cyls. 419x609mm 16½"x24", built by Avonside in 1875 (up to no. 44) and 1876 (45 onward).

IRS Avonside list gives cyls. as 17.5" x 24" for these locos, ie. 444mm x 609mm.

- | | | |
|----------------------------------|----------|--|
| 39 'BELLA VISTA' | w/n 1076 | Cylinders replaced 1889 [29]. New boiler in 1892 [<i>DOP memoria</i> 1892B] when in service in Section 1. Tender reconstructed 1897. Withdrawn 1918 [30]. |
| 40 'BARÓN' | w/n 1077 | Reconditioned boiler fitted 1892, also air brake fitted, and new cylinders. 1902 list says d/w 58". Withdrawn 1918 [30]. |
| 41 'EL SALTO' | w/n 1078 | Loco with this number in course of dismantling 1923 [3]. |
| 42 'La CRUZ' | w/n 1079 | New boiler in 1892 [<i>DOP mem</i> 1892B] when in service in <i>Zona I</i> . 1902 list says d/w 58". Withdrawn 1921 [30]. |
| 43 'Las VEGAS' | w/n 1080 | Reconditioned boiler fitted 1892, and new cylinders. New boiler 1896. Withdrawn 1919 [30]. |
| 44 'CHAGRES' | w/n 1081 | New cylinders 1892. Withdrawn 1918 [30]. |
| 45 'SAN RÓQUE' | w/n 1098 | New boiler in 1892 [<i>DOP mem</i> 1892B] when in service in Section 1. 1902 list says d/w 58". To be withdrawn in 1921 [<i>EFE memoria</i> 1920 p323] |
| 46 'CURIMÓN' | w/n 1099 | Boiler rebuilt 1896. Had cyls. 17x24" in 1902. Overhauled by <i>Fabrica La Unión</i> in 1909, at a cost of \$14,800 [<i>El Mercurio</i> 1st Sept. 1909]. Withdrawn 1918 [30]. |
| 47 'QUILICURA' | w/n 1100 | Cylinders rebored and new boiler 1889 [29]. Withdrawn 1921 [30]. To be withdrawn in 1921 [<i>EFE memoria</i> 1920 p323] |
| 48 'YUNGAI' | w/n 1101 | Boiler replaced 1888 [28]. 1902 list says d/w 58". Withdrawn 1921? |
| 49 'CENTINELA' | w/n 1102 | Cylinders rebored 1889 [29]. New cylinders 1896. Withdrawn 1921 [30]. To be withdrawn in 1921 [<i>EFE memoria</i> 1920 p323] |
| 50 'CABRITERÍA' | w/n 1103 | Cylinders rebored 1889 [29]. 1902 list says d/w 58". Withdrawn 1921 [30] or in 1920 [<i>EFE memoria</i> 1920 p323]. |
| 51 'La CAMPAÑA' | w/n 1104 | Boiler replaced 1888 [28]. New cylinders 1892. Withdrawn 1919 [30]. |
| 52 'ALMENDRAL' | w/n 1105 | Boiler replaced 1888 [29]. Cylinders rebored 1889 [29]. New tender 1892. New cylinders 1897. 1902 list says d/w 58". Withdrawn 1918 [30]. |
| 53 'ANJEL CUSTODIO GALLO' | w/n 1106 | Boiler replaced 1888 [29]. Cylinders rebored 1889 [29]. 1902 list says d/w 58". To be withdrawn in 1921 [<i>EFE memoria</i> 1920 p323] |
| 54 'I. WADDINGTON' | w/n 1107 | Source [13] says name was ' G. WADDINGTON ', another source says ' J. WADDINGTON '. 1902 list says d/w 58". Withdrawn 1918 [30]. |
| 55 'MATIAS COUSIÑO' | w/n 1108 | Cylinders rebored 1889 [29]. Boiler rebuild 1897. Withdrawn 1921 [30] or in 1920 [<i>EFE memoria</i> 1920 p323]. |

56 'JORGE LYON'

w/n 1109

Photo confirms Inside cyls. Cylinders rebored 1889 [29]. New cylinders 1892. Withdrawn 1918 [30].

8 locos in class, **40, 42, 45, 48, 50, 52, 53 and 54**, in 1902 [19], listed as '*de carga, livianos*', and with d/w 58".

On a separate line: 11 locos in class, **38, 39, 41, 43, 44, 46, 47, 49, 51, 55, 56**, in 1902 [19], listed as '*de carga, livianos*'. Locomotives **14-16, 21, 38-56** listed in Post-1908 diagram book [24], as one class though with varying wheel sizes.

Tipo 4

0-4-4T d/w 1524mm 60", cyls. 419x660mm 16½"x24", built at railway's Valparaiso shops in 1883

Nos **35-38** and **57** were built using Hawthorn and Avonside spares, and in some lists they are ascribed to these builders. Hawthorns' numbers 425 and 426 are reported in some sources for these locos [Copeland].

57 'CHILENA'

Confirmed by [1] as being constructed from a Sturrock steam tender, and with an all-up weight of 45520kg. However, Arturo Squire said it was built in Valparaiso from Avonside parts, and this seems more likely. An undated diagram book page gives d/w as 59". Withdrawn 1918 [30], or to be withdrawn in 1921 [EFE memoria 1920 p323]

1 loco in class, **57**, in 1902 [19], listed as '*maniobras*', with rebuild date given as 1883. Locomotives **6** and **57** listed in Post-1908 diagram book [24].

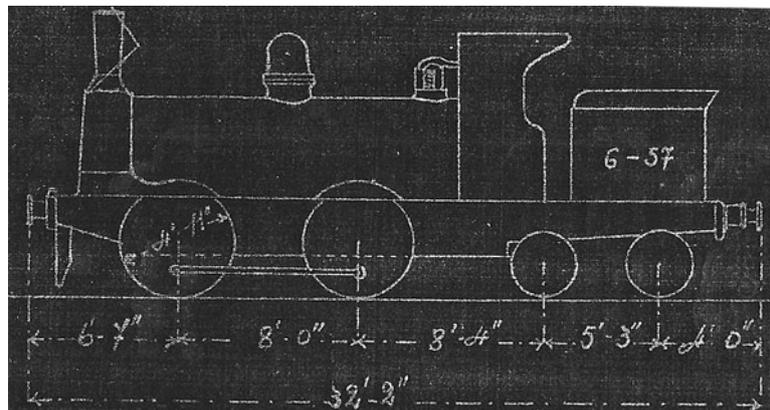


Image from an undated diagram book by courtesy of Señor Pablo Moraga.



Photo in P. C. Dewhurst collection, possibly by Arturo Squire, around the time of the First World War.

Note the different placing of the dome, when compared to the sketch above.

Tipo 11

0-6-0T d/w 1220mm 48", cyls. 270x406mm 10½"x16", built at railway's Valparaiso shops in 1873

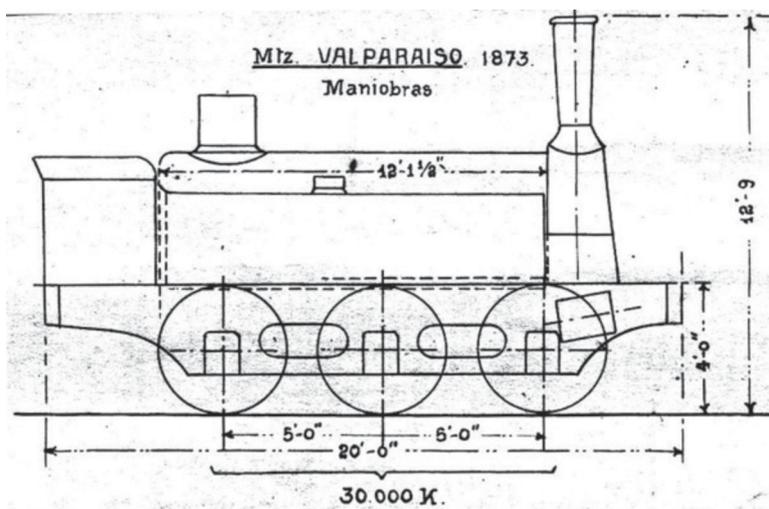
Constructed from a Sturrock steam tender supplied with nos. 11-13. Confirmed by [1].

58 'ARDILLA'

The name 'Ardilla' means Squirrel. Withdrawn 1915 [30].

2 locos in class, **58-59**, in 1902 [19], listed as '*maniobras*'. Two locos **58-59** listed in post-1908 diagram book [24] and both shown as 0-6-0Ts. It looks as if both this engine and the one below were built as 0-6-4Ts but were later re-

built as 0-6-0Ts at different dates.



Sketch is from post-1908 *EFE* diagram book, in the SLS library file LD1896.

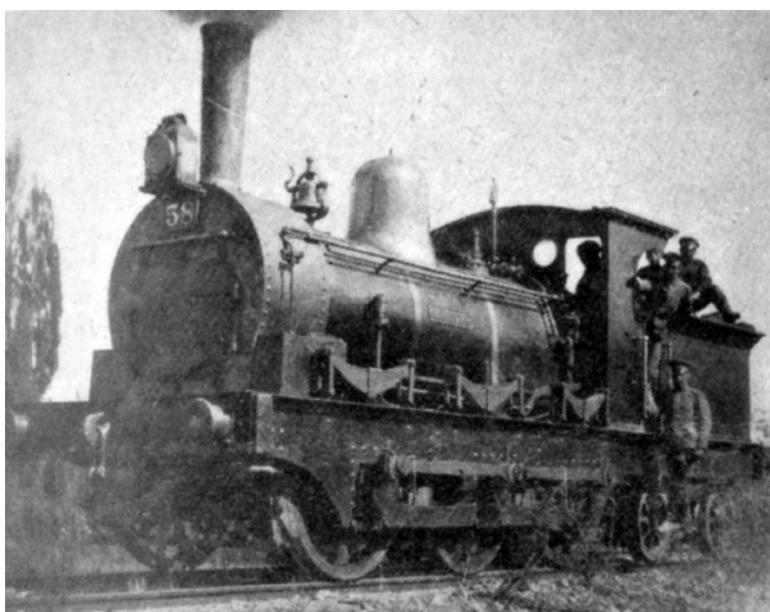


Photo from Pablo Moraga's collection, but originally published in *Sucesos* issue 366 in 1909.

Tipo 11

0-6-4T d/w 1220mm 48", cyls. 270x406mm 10½"x16", built at railway's Valparaiso shops in 1877

Constructed from a Sturrock steam tender supplied with nos. 11-13. Confirmed by [1]. [6] states that 'ARDILLA' and 'ABEJA' were both constructed from Sturrock steam tenders and they were 0-6-0T and 0-6-4T respectively, classified A1 and B2, and used on the Mercado Central branch in Santiago. NB The post-1908 diagram book shows both of the above locos as 0-6-0T, and indeed gives the same overall length of 21' 0"; it is therefore possible that no. 59 was cut down from 0-6-4T to 0-6-0T in later years. However, the photos published here from *Sucesos* magazine 366 in September 1909 distinctly show both locos, identifiable as having slight differences, and yet both clearly operating as 0-6-4Ts.

59 'ABEJA'

The name 'Abeja' means Bee. An extremely poor photo of a tank loco named 'ABEJA' inside a loco shed suggests that this engine was at one point a tank loco looking very much like the sketch of 'ARDILLA' on the previous page. Withdrawn 1914 [30].

2 locos in class, 58-59, in 1902 [19], listed as 'maniobras'. Two locos 58-59 listed in post-1908 diagram book [24] and both shown as 0-6-0Ts.

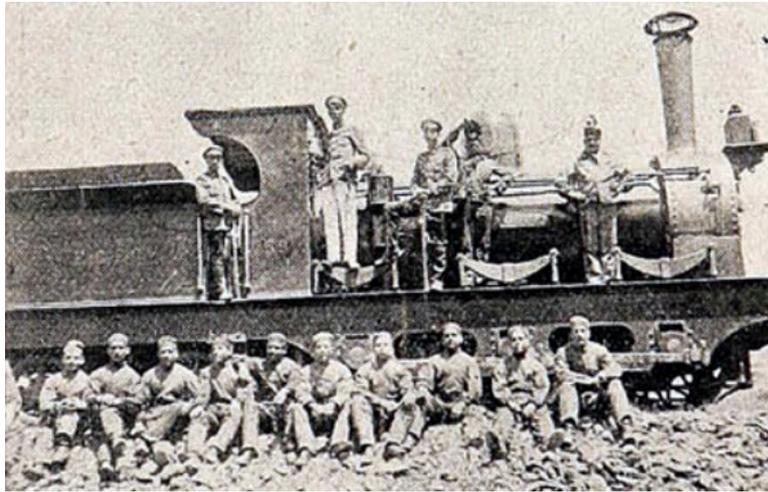


Photo published in *Sucesos* issue 366 in 1909 when these locos were being used at least occasionally for training a battalion of railway soldiers.

Tipo 11bis

0-4-4T *d/w 925mm 36½", cyls 177x355mm 7"x14", built by Rogers in 1872*

For early history and speculation about its origins in Peru, see above in *FCSV* section.

60 'PLACILLA' w/n (2032 in CF list) Probably the ex *FC Ilo a Moquegua* 'passenger pony' named 'EL HUANACO'. Rebuilt 1884 as an inspection saloon according to [7a] but in fact may well have been like that from new.

1 loco in class, **60**, in 1902 [19], listed as '*servicios especiales*'. In 1921 was in 2nd zone. In active fleet around 1928 [36], but must have been withdrawn soon after. Loco with this number '*excluidas*' in 1930 [3].



Note that the bodywork has been replaced, the new woodwork having two side doors instead of one, less obvious panelling, and a much higher roof.

Ex *FC del Sur* locos:

Tipo 12

4-4-0TT *d/w 1067mm 42", cyls. 279x559mm 11"x22", built by Rogers in 1859*

61 'REQUÍNOA' w/n (847 in CF list) Normally assumed to have been ex *FC del Sur* no. **5** 'MAIPÚ'.

However, Sr. Pablo Moraga has pointed out that the diagram below showing no. **61** actually looks much more like the ex-*FCS* 4-4-0T Rogers tank loco no. **7** 'MAPOCHO', albeit with an added tender. The name 'MAPOCHO' will in any case have been changed because it duplicated the name of *FCSV* loco. no. **14**.

The cylinder bore and stroke listed above and taken from the diagram sheet are different from the 14x24" of the original nos **5** and **7**, but

says **1** had been rebuilt with a bogie during that year. The *DOP memoria* for 1888 also says the 1887 loco replaced a predecessor that had given more than thirty years of service. *Name and number reused for a replacement loco built at Valparaiso workshops in 1887, see below.*

Tipo 15

4-4-0 d/w 1676mm 66", cyls. 381x609mm 15"x24", built by Baldwin in 1874

68 'LIRCAI'	w/n 3554	ex <i>FCS</i> no. 20 , ex <i>FCCCiT</i> no. 21 ; New tender 1889 [29]. Loco with this number recorded as ' <i>detenidas</i> ' at San Bernardo (withdrawn?) during 1923 [3].
69 'MAULE'	w/n 3555	ex <i>FCS</i> no. 22 , ex <i>FCCCiT</i> no. 22 ; Tender rebuilt 1888 [28]. Withdrawn 1919 [30], or to be withdrawn in 1921 [<i>EFE memoria</i> 1920 p323]
70 'LINARES'	w/n 3520	ex <i>FCS</i> no. 23 , ex <i>FCCCiT</i> no. 18 ; Operated for many years by <i>DOP</i> on hire to contractors; 1902 Pitruquen to Loncoche. <i>ArNAd</i> file [MOBR1914] says Bobillier complained that it had serious defects when delivered to him in 1900. Then repaired by Lever Murphy in 1901, repaired again 1903 and returned to Bobillier. 1910 was at Saboya as shunter for Capitán Pastene NG branch contractor, 1912 back with <i>EFE?</i> , 1914 Puá to Curacautín, 1920 location unspecified, 1930 under repair at San Eugenio or Fabrica Copetta [2] [3]. On hire to <i>DOP</i> in 1920 [<i>EFE memoria</i> 1920 p323].

Spares ordered from Baldwin via Hemenway & Browne in June 1892: 2 dry pipes, 2 smokebox fronts and doors, 4 Crosby safety valves (This sentence repeated at locos **100-105** below).

9 locos in class, **68-70 & 100-105**, in 1902 [19]. List in post-1908 diagram book [24] on page 22 (?) includes **68-70, 100-105, 261-274** and **492**.

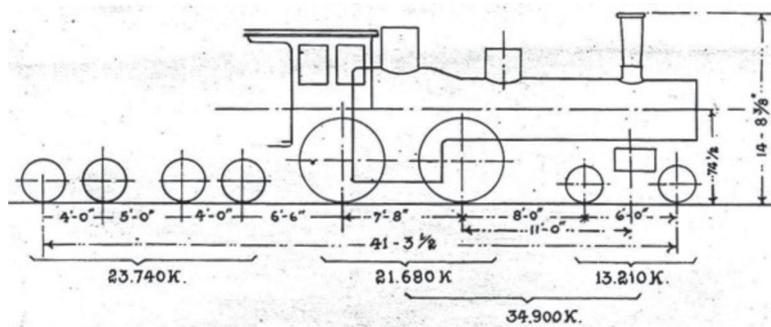
Tipo 16

4-4-0 d/w 1676mm 66", cyls. 381x559mm 15"x22", built by Rogers in 1883 (71), 1884 (72-75).

Nos. **72-75** were the four replacements for locos lost at sea and may well have arrived in Chile after the formation of the *EFE*. As such they may never have received *FCCCiT* running numbers.

71 'BUIN'	w/n 3309	ex <i>FC del Sur</i> no. 27 Loco with this number in course of dismantling 1923 [3].
72 'TACNA'	w/n 3441	ex <i>FCCCiT</i> no. ? Boiler rebuilt 1888 [29]. May also have worked for the <i>DOP</i> , supposedly stored at San Miguel/Los Angeles in 1930 [3].
73 'ARICA'	w/n 3442	ex <i>FCCCiT</i> no. ? New boiler in 1897 whilst working in 2nd section.
74 'DOMINGO SANTA MARÍA'	w/n 3443	ex <i>FCCCiT</i> no. ? Loco with this number in course of dismantling 1923 [3].
75 'J. J. PERÉZ'	w/n 3444	ex <i>FCCCiT</i> no. ? Withdrawn 1914 [30], or to be withdrawn in 1921 [<i>EFE memoria</i> 1920 p323]

5 locos in class, **71-75**, in 1902 [19]. All five locos listed in post-1908 diagram book [24] on page 23 (?), plus nos. **132-133**. 1 loco of *tipos* 16, 17 or 18 still in fleet around 1928 [36] though listed as 'obsolete or knocked-down'.



Sketch is from post-1908 *EFE* diagram book, in the SLS library file LD1896.

Tipo 17

4-4-0 d/w and cyls. see notes for each loco, built by Rogers in 1856 (76) and 1861 (77)

76 'SAN BERNARDO' w/n (727? in CF list) d/w 1422mm 56", cyls. 419x609mm 16½"x24", ex *FC del Sur* no. **4** or no. **7**? Name and number reused for replacement loco built at Santiago workshops in 1888, see below.

77 'SAN FERNANDO' w/n (998 in CF list) Ex *FCS* no. **9**. d/w 1676mm 66" according to Arturo Squire but 1600mm 63" according to [6], and cyls. 355x609mm 14"x24" or 16"x24" [same sources]. Used by *DOP* on *FC de Circunvalacion* in 1905 [2]. Confirmed by memo in *ArNad* file MOBR1802. Withdrawn 1917 [30].

2 locos in class, **76-77**, in 1902 [19], listed as '*de carga, livianos*', and with d/w given as 57". Two locos, **76-77**, listed in post-1908 diagram book [24] on page 20 (?), with **76** having d/w 56" and **77** having d/w 66". 1 loco of *tipos* 16, 17 or 18 still in fleet around 1928 [36] though listed as 'obsolete or knocked-down'.

Tipo 18

4-4-0 d/w 1676mm 66", cyls. 419x609mm 16½"x24", built by Rogers in 1868 (78), 1871 (79) and 1872 (80)

78 'CURICÓ' w/n (1532 in CF list) ex *FC del Sur* no. **14**, ? Loco **78 bis** returned to *DOP* 1932. [3]. [26] suggests this had been *FCS* no. **18** and was Rogers 1536.

79 'PALMILLA' w/n (1900 in CF list) ex *FC del Sur* no. **15**. Was working for *DOP* 1910 (Melipilla to

San Antonio), 1911 location unknown, 1912 was at Alcones to Pichilemu, 1914 was at El Lingue to Pichilemu, 1920 location was unspecified, and 1930 was stored at San Miguel/Los Angeles [2] [3]. On hire to *DOP* in 1920 [*EFE memoria* 1920 p323]. [26] suggests this was Rogers 1536. Diagram sheet suggests this loco had 56" d/w latterly.

80 'CACHAPOAL' w/n 2309 ex *FC del Sur* no. **17**. Boiler replaced 1888 [29]. Cylinders rebored 1889 [29]. Tender rebuilt 1889 [29]. New tender 1896, when working in 2nd section, also air brake fitted. Withdrawn 1915 [30].

4 locos in class, **78-80, 124**, in 1902 [19], listed as '*de carga, livianos*', and with d/w given as 56 3/8". Three locos, **78-80**, listed in post-1908 diagram book [24], with **79** having d/w 56" and **78 & 80** having d/w 66". 1 loco of *tipos* 16, 17 or 18 still in fleet around 1928 [36] though listed as 'obsolete or knocked-down'.

Tipo 19

2-6-0 d/w 1422mm 56", cyls. 432x609mm 17"x24", built by Rogers in 1883

81 'BENJAMIN VICUÑA MACKENNA' w/n 3314? ex *FCCCiT* no. **29** or **31**?, Broke a crankpin in 1884. Hit a cow on the line north of Pillanlelbun station in February 1895. At

Valdivia in 1901, hired by *DOP* to A. Nicolai.

7 locos in class, **81, 86, 89, 90, 91, 117, 118**, in 1902 [19], listed as '*de carga, pesados*', with d/w given as 57½". Listed in post-1908 diagram book [24] on page 23 (?) as a class containing nos. **81, 86, 89-91, 118, 134-138, 84-85**. 8 in fleet around 1928 [36] but listed as 'obsolete or knocked-down'.

Names not previously met

Whilst the vast majority of *FCSV*, *FC del Sur* and *FCCCiT* locos retained their original names into the *EFE* fleet after 1884, there seem to have been a few which were changed. On this page and those following are the names '**BEN-JAMIN VICUÑA MACKENNA**', '**GULTRO**', '**HOSPITAL**', '**LAJA**', '**BIO BIO**', '**MALLECO**', '**PAN-GUILEMO**' and possibly '**ANGEL PRIETO i CRUZ**', which were not listed before the grouping, and on the other hand there are several pre-grouping locos which cannot be matched precisely to post 1884 identities. These last include *FCCCiT* nos. **31, 32** & the pair of 1883 Rogers 2-6-0s.

4-6-0 d/w 1270mm 50", cyls. 432x609mm 17"x24", built by Rogers in 1862

82¹ 'CONTRATISTA' w/n (1030 in CF list) ex *FC del Sur* no. **12**. [AS, see appendix, wrote] "The old Rogers went into the Bio Bio river with paymasters car, and stayed there." However, the date and precise location are unknown.

Name and number reused for a replacement loco built at Valparaiso workshops in 1888, see below.

2-6-0 d/w 1372mm 54", cyls. 406x609mm 16"x24", built by Hawthorn in 1864

Inside cylinders.

83¹ 'LINDEROS' w/n 1285 Originally an 0-6-0. ex *FC del Sur* no. **13 'CHILENA'**. Name presumably changed to avoid confusion with ex *FCSV* loco no. **57**. Boiler rebuilt 1888 [29]. Arturo Squire, in a letter to P. C. Dewhurst in 1925, suggests "the old 'Linderos' was probably built in 1856 as you say, but the second one had a home-made plate frame and cylinders, boiler and motion from Hawthorn spares, and a home-made bogie. She was a brute."

1 loco in class, **83**, in 1902 [19], listed as '*maniobras*', with rebuild date given as 1865.

Number 83 reused by 1883 according to one source (though the 1902 list does not support this), but more likely reused for a tipo 20 4-4-0 in 1909, see below.



83 'LINDEROS' seen after the addition of its pony truck. Source unknown.

Tipo 19

2-6-0 d/w 1372mm 54", cyls. 406x609mm 16"x24", built by Rogers in 1874 (84-5) and 1884 (86)

84 'TALCA' w/n 2379 ex *FC del Sur* no. **18**. Cylinders replaced 1888 [28], and also broke a crankpin that year. Boiler replaced 1888 [29].

85 'LONTUÉ' w/n 2380 ex *FC del Sur* no. **19** Withdrawn 1918 [30].

86 'GULTRO' w/n 3315? ex *FCCCiT* no. **32?** Of the three unidentified Rogers 2-6-0s on this and the next page built around 1884, it is likely that two were Rogers

3401 and 3405. Replacement reconditioned boiler fitted 1897 whilst working in 2nd section. Loco with this number recorded as 'detenidas' at MSB (withdrawn?) during 1923 [3].

7 locos in class, **81, 86, 89, 90, 91, 117, 118**, in 1902 [19], listed as '*de carga, pesados*', with d/w given as 57½". On a separate line: 2 locos in class, **84-85**, in 1902 [19], listed as '*de carga, pesados*', with d/w given as 56 3/8". Listed in post-1908 diagram book [24] as a class containing nos. **81, 86, 89-91, 118, 134-138, 84-85**.

Tipo 21

(1st batch +)

2-6-0 d/w 1372mm 54", cyls. 406x609mm 16"x24", built by Baldwin in 1882

87 'JOSÉ T. URMENETA' w/n 6039 ex FCCCiT no. **25**; [26] concurs. New boiler in 1892 [DOP mem 1892B] when in service in Section 2. Loco **87** leased to *Depto. De Obras Maritimas* in 1932 [3]. Supervised by Concepción 1939, 1942, 1951 & 1955. Seen in steam at Temuco 1968 [35]. This late survival is puzzling. Was the number reused for a later engine?

88 'CHORILLOS' w/n 6036 ex FCCCiT no. **26**. Boiler rebuilt 1888. Cylinders rebored 1889 [29]. Boiler repaired by Lever Murphy at a price of 2,571 Pesos in June 1893 [DOP boletin 1st semester 1893 p639].

4 locos in class, **87, 88, 93, 119**, in 1902 [19], listed as '*de carga, pesados*', with d/w given as 57 5/8" and cyls. 17"x24". Listed in post-1908 diagram book [24] as a class containing nos. **87-88, 139-150, 151-164, 119, 93**.

Tipo 19

2-6-0 d/w 1422mm 56", cyls. 406x609mm 16"x24", built by Rogers in 1883

89 'LA INDUSTRIA' w/n 3311 ex FC del Sur no. **28**, in use by DOP mid-1890s to mid-1900s. Loco with this number recorded as 'detenidas' at San Bernardo (withdrawn?) during 1923 [3].

90 'SAN FRANCISCO' w/n 3313 ex FC del Sur no. **30**. Replacement reconditioned boiler fitted 1897 whilst working in 2nd section. Reconstructed at Valdivia shops in 1910 [1]. Withdrawn 1916 [30].

7 locos in class, **81, 86, 89, 90, 91, 117, 118**, in 1902 [19], listed as '*de carga, pesados*', with d/w given as 57½". Listed in post-1908 diagram book [24] as a class containing nos. **81, 86, 89-91, 118, 134-138, 84-85**. 8 in fleet around 1928 [36] but listed as 'obsolete or knocked-down'.

Tipo 20? (Not same as the later tipo 20)

2-6-0 d/w 1676mm 57 5/8", cyls. 445x609mm 17½"x24", built by Rogers in 1884

One source said d/w was 66", but this seems doubtful.

91¹ 'HOSPITAL' w/n 3401? Of the three unidentified Rogers 2-6-0s on this and the next page built around 1884, it is likely that two were Rogers 3401 and 3405. Involved in minor collision at Talca with train 12, on July 20th 1889 (1888?).

Arturo Squire, in his 1925 letter to P.C. Dewhurst, says that "91 'Hospital' and another engine, were bought by contractors and may not figure in Rogers' list as being supplied to Chilean Rlys., but the maker and date are right as I took them myself from the numberplate in 1889." [Later notes from AS, see Appendix 2, section 1.5.2, suggest this was a sister to **116 'LAJA'** or to '**CACHAPOAL**' but both of those were 4-4-0s.

Listed in 1896 diagram book [24] as a class containing nos. **81, 86, 89-91, 118, 134-138, 84-85**. 7 locos in class, **81, 86, 89, 90, 91, 117, 118**, in 1902 [19], listed as '*de carga, pesados*', with d/w given as 57½".

Number 91 reused for a new loco (probably tipo 20) between 1909 and 1912. See below.

Tipo 22

(1st batch +)

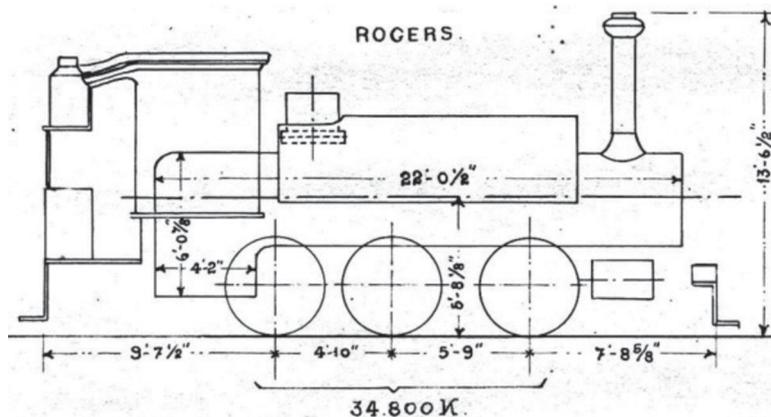
0-6-0STd/w 1270mm 50", cyls. 355x559mm 14"x22", built by Rogers in 1884

92 'CUNACO'

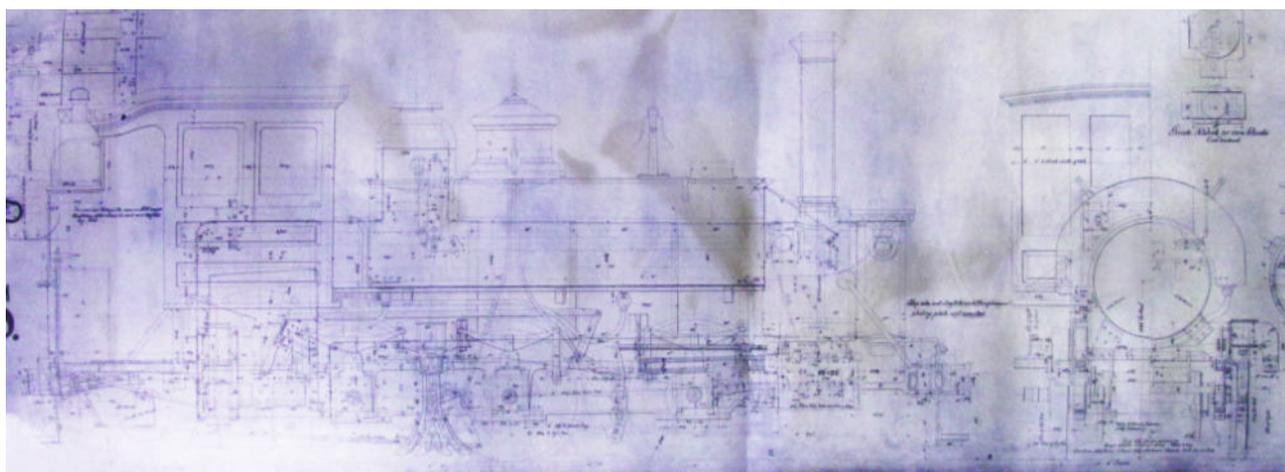
w/n 3446

Rogers list says ordered by FCCCiT, but may have entered straight into EFE fleet from new. New cylinders fitted 1892 [DOP mem. 1892]. Arturo Squire / P. C. Dewhurst say 13x22" cyls.

9(?) locos in class, **92, 199-206**, in 1902 [19], listed as 'maniobras', cyls. given as 13"x24". Nine locos listed in post-1908 diagram book. 4 in active fleet around 1928 [36]. 4 in active fleet in 1958 but only 1 left in 1968 [49].



Sketch is from post-1908 EFE diagram book, in the SLS library file LD1896.



A photostat of a Rogers blueprint is in the Dewhurst archive at the NRM in York.

This is a low-res inverted copy of it.

Ex FCCCiT locos:

Tipo 21

(2nd batch +)

2-6-0 d/w 1372mm 54", cyls. 432x609mm 17"x24", built by Baldwin in 1882

Different boilers and details from the majority of tipo 21, according to Arturo Squire.

93 'LIMA'

w/n 6041

ex FCCCiT no. **28**. Not shown in 1902 list. Withdrawn 1916 [30].

Listed in post-1908 diagram book [24] on page as a class containing nos. **87-88, 139-150, 151-164, 119, 93**.

Tipo 23

2-6-0 d/w 1372mm 54", cyls. 432x609mm 17"x24", built by Rogers in 1871

94 'HUALQUI'

w/n 1938

ex FCCCiT no. **3**. Tender rebuilt 1888 [28], and again 1896. New cylinders 16.5x24" in 1892 [DOP mem 1892].

- 95 'TALCAMÁVIDA'** w/n 1939 ex *FCCCiT* no. **4** Withdrawn 1921 [30].
96 'MALVOA' w/n 1941 ex *FCCCiT* no. **5** Loco with this number recorded as '*detenidas*' at San Bernardo (withdrawn?) during 1923 [3].

3 locos in class, **94-96**, in 1902 [19], listed as '*de carga, pesados*', with d/w given as 57". All three locos, and no. **122**, listed in 1896 diagram book [24] on page 13 (?). 2 in fleet around 1928 [36] but listed as 'obsolete or knocked-down'.

Tipo 24

4-4-0 d/w 1676mm 66", cyls. 432x609mm 17"x24", built by Rogers in 1870

- 97 'CONCEPCIÓN'** w/n (1721 in CF list) ex *FCCCiT* no. **2**. BLW list gives dimensions as d/w 65" & cyls. as 16½"x24". EFE 1902 list gives d/w 66" and cyls. 16½"x24". Loco with this number leased to *FC de Lebu a Los Sauces* 1923 [3]. Sold to Braden Copper Co. in 1929 [3] presumably for scrap.

Listed in 1896 diagram book [24]. 1 loco in class, **97**, in 1902 [19]. One loco listed in post-1908 diagram book [24] on page 14 (?). 1 in fleet around 1928 [36] but listed as 'rented or loaned'.



Photo from the *DIBAM* colección at the *Biblioteca Nacional* in Santiago.

Tipo 25

4-4-0 d/w 1676mm 66", cyls. 381x609mm 15x24", built by Rogers in 1871

- 98 'F. ERRÁZURIZ E.'** w/n (1929 in CF list) ex *FCCCiT* no. **6**, originally '**YUMBEL**', then '**FEDERICO ERRÁZURIZ**'. Boiler replaced 1888 [28]. New boiler 1896-7 whilst working in 2nd section. Loco with this number recorded as '*detenidas*' at San Bernardo (withdrawn?) during 1923 [3].

- 99 'BULNES'** w/n (1932 in CF list) ex *FCCCiT* no. **7**. Tender rebuilt 1888 [28]. In 1888 it was commented that this was the only loco with bronze tubes. Boiler replacement 1897 whilst working in 3rd section, also new cylinders. To be withdrawn in 1921 [*EFE memoria* 1920 p323] Under *DOP* supervision in 1930 but stored at San Miguel/Los Angeles [2].

Both listed in 1896 diagram book [24]. 2 locos in class, **98-99**, in 1902 [19]. Both locos listed in post-1908 diagram book [24] on page 15 (?). 1 in fleet around 1928 [36] but listed as 'obsolete or knocked-down'.

Tipo 15

4-4-0 d/w 1676mm 66", cyls. 381x609mm 15"x24", built by Baldwin in 1874

- 100 'M. A. TOCORNAL'** w/n 3581 ex *FCCCiT* no. **8**. Boiler replaced by new when working in 3rd

		section in 1896. Withdrawn 1921 [30]. To be withdrawn in 1921 [EFE memoria 1920 p323]
101 ‘BERNARDO O’HIGGINS’	w/n 3582	ex FCCCiT no. 9 . New tender 1889 [29]. Boiler replaced 1888 [29]. Loco 101 ‘O’HIGGINS’ rebuilt by Concepción shops in 1910 [1], having a 4 axle tender and a weight of 54000kg. Loco with this number ‘ <i>excluídas</i> ’ in 1930. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3].
102 ‘ANIBAL PINTO’	w/n 3584	ex FCCCiT no. 10 . Boiler replaced by new when working in 3rd section in 1896, also new cylinders. Withdrawn 1921 [30]. To be withdrawn in 1921 [EFE memoria 1920 p323]
103 ‘SAN ROSENDO’	w/n 3530	ex FCCCiT no. 13 . Ran 70,317 km in 1896. New tender 1897 whilst working in 3rd section. In use by DOP on Pitrufulquen to Loncoche in 1902 [2].
104 ‘ANGOL’	w/n 3532	ex FCCCiT no. 14 . Loco with this number dismantled 1923 [3].
105¹ ‘SAN CARLOS’	w/n 3519	ex FCCCiT no. 20 ; the loco with this name and number was certainly a Baldwin 4-4-0 at end of December 1883, when a list of FCCCiT locos was recorded [41, p98]. <i>However, the name and number were reused for a replacement Rogers loco purchased second-hand from a contractor in 1884, see below. Given that this original no. 105 was only ten years old at that point, one wonders if Arturo Squire’s paragraph in Appendix 2 applies: “Also a considerable number of old locomotives scrapped themselves in rivers & collisions – and the numbers were filled either by engines built from spares or by new imports, and no record was kept. The Division Supts. were the gods & only reported to the Minister till 1884, and if they had a few losses among their engines, they slung spares together in time for the annual balance.”</i>

Spares ordered from Baldwin via Hemenway & Browne in June 1892: 2 dry pipes, 2 smokebox fronts and doors, 4 Crosby safety valves (This sentence repeated at locos **68-70** above).

9 locos in class, **68-70 & 100-105**, in 1902 [19]. List in post-1908 diagram book [24] on page 22 (?) includes **68-70, 100-105, 261-274** and **492**. 11 still in fleet around 1928 [36], 1 active, 9 listed as ‘obsolete or knocked-down’, and 1 as ‘rented or loaned’.

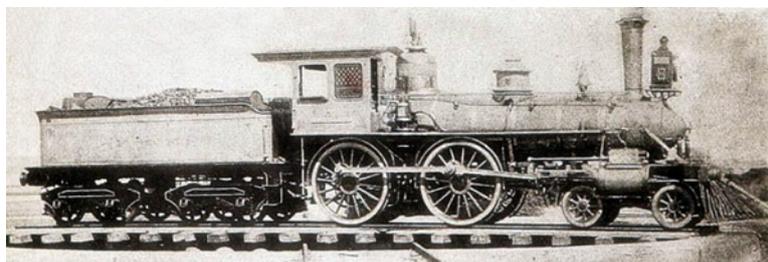


Photo from magazine *Sucesos* shows no. **101** after rebuild at Maestranza Concepción, in 1911.

Tipo 19

2-6-0 d/w 1422mm 55", cyls. 432x609mm 17"x24", built by Rogers in 1883

Of the three unidentified Rogers 2-6-0s on this and the previous page built around 1884, it is likely that two were Rogers 3401 and 3405.

105² ‘SAN CARLOS’	w/n ?	[26] says this was Rogers 3405 ex contractor, though Rogers list gives FCCCiT as first owner of that loco. It may merely be that the loco was initially hired by the DOP to a contractor. Tender rebuilt 1888 [28].
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This loco ran highest mileage (105,408km) of any in Zona 3 during 1907 [41, p122].

8 in fleet around 1928 [36] but listed as 'obsolete or knocked-down'. *Number 105 was re-used in 1912 for a tipo 20 4-4-0.*

Tipo 26

2-6-0 d/w 1422mm 56", cyls. 457x609mm 17½"x24", built by Rogers in 1870

106 'TALCAHUANO' w/n (1722 in CF list) ex FCCCiT no. **1**. Loco with this number recorded as 'detenidas' at San Bernardo (withdrawn?) during 1923 [3].

1 loco in class, **106**, in 1902 [19], listed as 'de carga, pesados', with d/w given as 57". One loco listed in post-1908 diagram book [24] on page 16 (?). 1 in fleet around 1928 [36] but listed as 'obsolete or knocked-down'.

Tipo 27

2-6-0 d/w 1422mm 56", cyls. 457x609mm 17½"x24", built by Baldwin in 1874

- 107 'ITATA'** w/n 3586 ex FCCCiT no. **11**. Tender rebuilt 1888 [28]. New boiler in 1892 [DOP mem 1892B] when in service in Section 3, also air brake fitted then, and new cylinders. Sold to Braden Copper Co. in 1929 [3] presumably for scrap.
- 108 'CHILLÁN'** w/n 3585 ex FCCCiT no. **12** Boiler rebuild 1897 whilst working in 3rd section, also new tender and air brake fitted. Sold to Braden Copper Co. in 1929 [3] presumably for scrap.
- 109 'Los ANJELES'** w/n 3533 ex FCCCiT no. **15**; Reconstructed tender 1892, whilst working in 3rd section. New tender 1897 whilst still in 3rd section. Loco with this number recorded as 'detenidas' at San Bernardo (withdrawn?) during 1923 [3]. Sold to Braden Copper Co. in 1929 [3] presumably for scrap.
- 110 'ARAUCO'** w/n 3534 ex FCCCiT no. **16**; Possibly '**FEDERICO ARAUCO**'. Cylinders replaced in 1888 [28]. Withdrawn 1921 [30].
- 111 'PARRAL'** w/n 3521 ex FCCCiT no. **17**. Sold to Braden Copper Co. in 1929 [3] presumably for scrap.

9 locos in class, **107-114, 123**, in 1902 [19], listed as 'de carga, pesados', with d/w given as 56 or 57". Same nine locos listed in post-1908 diagram book [24] on page 17 (?). 8 in fleet around 1928 [36] but listed as 'obsolete or knocked-down'.



Tipo 16, later tipo 27

2-6-0 d/w 1422mm 56", cyls. 457x609mm 17½"x24", built by Rogers in 1874

112 'LONGAVI' w/n 3522 ex FCCCiT no. **19**, Sold to Braden Copper Co. in 1929 [3]

113 'VILLA MOLINA' w/n 3556 presumably for scrap.
 ex FCCCiT no. 24, Boiler replaced by new when working in 3rd section in 1896. Sold to Braden Copper Co. in 1929 [3] presumably for scrap.

114 'COLCHAGUA' w/n 3539 ex FCS no. 24, ex FCCCiT no. 23,
 9 locos in class, 107-114, 123, in 1902 [19], listed as 'de carga, pesados', with d/w given as 57". 8 in fleet around 1928 [36] but listed as 'obsolete or knocked-down'.

Worn out locos which had not been expected to live long enough into the EFE years to be classified in one of the main classes:

Tipo 27bis

2-2-0T d/w 838mm 33", cyls. 127x305mm 5"x12", built by Rogers in 1875

An Arturo Squire annotation on a diagram sheet states that this loco 'came from Peru' but this has not been confirmed in any way, and may be the result of confusion with no. 60 'PLACILLA'.

115 'QUILAPAN' w/n 2393 ex FCCCiT. Original name may have been 'CABALLEJO' according to Rogers list. May have then been named 'CHILENITA' for a period. Retired in 1919 [according to PC].

1 loco in class, 115, in 1902 [19], listed as 'servicios especiales'.

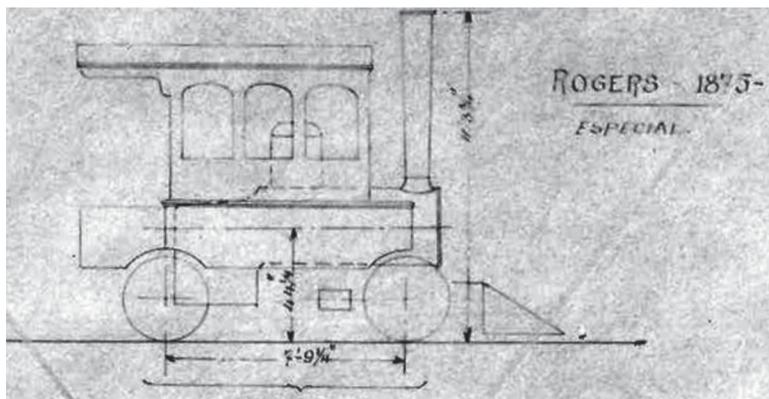


Image reversed from a blueprint diagram. The enclosed upper bodywork was almost certainly a modification during the loco's operating career.

(Tipo 28)

4-4-0 d/w 1372mm 54", cyls. 432x609mm 17"x24", built by Rogers in ?

116 'LAJA' w/n ? Ex-? Arturo Squire suggested in 1925 that this might have been one of several engines shipped from Peru in 1884 (sic) during the war.

Name and number reused for a replacement loco built at Valparaiso workshops in 1886, see below.

Tipo 19

2-6-0 d/w 57½", cyls. 432x609mm 17"x24", built by Rogers in 1883-4

117² 'BIO BIO' w/n

0-4-2T d/w ?, cyls. ?, built by Rogers in ?

117¹ 'BIO BIO' w/n If a Rogers loco this must certainly have been rebuilt from a different wheel arrangement as Rogers supplied no 0-4-2s for Chile. Some sources [Copeland] and [26] speculate might have dated from an 1869 re-build of FC del Sur no. 7 'MAPOCHO', but no. 7 may

well have become *EFE* no. **61**, see above. PM's list says this may have been ex *FCS* inspection car named '**EXPRESO**', but there was no such vehicle in an 1883 *FCS* list. Another possibility is that it was rebuilt from *FC Ilo y Moquegua* 0-4-0T '**ALERTA**', built by Rogers in 1871 and presumably commandeered by the Chilean army during the War of the Pacific. Probably withdrawn before 1909, as does not appear in post-1909 diagram book. (A loco with this number 117 'excluidas' in 1930, and one with this number 117 was then sold to Braden Copper Co. for scrap in 1931 [3]. However, this was probably the Baldwin 0-6-2T with DOP no. 117, tipo 29, see below.)

7 locos in class, **81, 86, 89, 90, 91, 117, 118**, in 1902 [19], listed as 'de carga, pesados', with d/w given as 57½".

The number 117 is supposed to have been held by locos of four different classes by 1896, or possibly by one loco that was classified in four different ways by that date!

Tipo 21

(3rd batch +)

2-6-0 d/w 1373mm 54", cyls. 432x609mm 17"x24", built by Baldwin in 1883 (118), 1882 (119)

Different boilers and details from the majority of *tipo 21*, according to Arturo Squire.

118¹ 'RENAICO' w/n 3204 or 3315? Origin unknown. Neither of the works numbers quoted match up in Gene Connelly's BLW list. Withdrawn 1919[30]. To be withdrawn in 1921 [*EFE memoria* 1920 p323]

119¹ 'MIRAFLORES' w/n 6040 ex *FCCCiT* no. **27**. Tender rebuilt 1896. Loco with this number 'excluidas' in 1930 [3].

4 locos in class, **87, 88, 93, 119**, in 1902 [19], listed as 'de carga, pesados', with d/w given as 57 5/8" and cyls. 17"x24". On a separate line: 7 locos in class, **81, 86, 89, 90, 91, 117, 118**, in 1902 [19], listed as 'de carga, pesados', with d/w given as 57½". Listed in post-1908 diagram book [24] on page 23 (?) as a class containing nos. **81, 86, 89-91, 118, 134-138, 84-85**. And on a different page, a class containing nos. **87-88, 139-150, 151-164, 119, 93**.

Numbers 117-9 were reused in 1909 for tipo 29 locos ex DOP. See below.

Tipo 44

4-4-0 d/w 66", cyls. 17½x24". built by Baldwin in ?

However, diagram sheet and 1902 list suggest was built at Maestranza Santiago in 1900-1. Note straight-topped boilers on this batch.

120 'RANCAGUA' 4-4-0 w/n 848? Copeland and [26] make a suggestion that **120** may have been the first **105**, replaced by a contractor's engine, sister to **91**. Withdrawn 1900. *Number reused for a 4-4-0 built in the Santiago workshops in 1900. See below.*

Tipo 30 or tipo 13?

4-4-0 d/w 1676mm 66", cyls. 381x609mm 15"x24", built by Rogers in 1862

121 'TINGUIRIRICA' w/n (1047 in CF list) ex *FC del Sur* no. **11** [26] suggests this was Rogers (1039). Tender rebuilt 1896.

3 locos in fleet, **63, 66 and 121**, in 1902 [19]. **121** listed on its own in post-1908 diagram book [24] on page 18 (?).

(Tipo 19 or 23?)

2-6-0 d/w 1422mm 57 5/8", cyls. 432x609mm 17"x24", built by Rogers in 1883

122 'VARAS' w/n 3204 ex *FC del Sur* no. **2** (2nd). There is a puzzle here. The original '**VARAS**' was supposedly withdrawn in 1883 [*MoI memoria* 1883] and replaced by a new Rogers 2-6-0 with the same number and name.

However, according to the personal notebook of railway engineer Anselmo Moraga, in 1885 it was transformed in Valparaiso workshops with a new rear bogie with 2 axles, becoming an 0-6-4T [details forwarded by Pablo Moraga]. But this is contradicted by the information that a replacement 2-6-0 **122 'VARAS'** was built at Santiago Workshops in 1886, and certainly the post-1908 diagram book shows loco **122** as a *tipo 23* 2-6-0 built in Chile.

Name and number reused for a replacement loco built at Santiago workshops in 1886, see below. 8 of tipo 19 in fleet around 1928 [36] but listed as 'obsolete or knocked-down'.

2-6-0 d/w 1447mm, cyls. 18x24", built by Baldwin in 1874

123¹ 'MALLECO' w/n ?

Name and number reused for a replacement loco built at Concepción workshops in 1887, see below.

Few details known, built by Avonside in 1868?

124¹ 'PANGUILEMO' ex FC del Sur no. ? but not in FCS list from December 1883.

Name and number reused for a replacement loco built at Santiago workshops in 1888, see below.

Few details known, built by ? in 1869

125 ex FC del Sur no. ? but not in FCS list from December 1883.

Possibly named '**ANGEL PRIETO i CRUZ**', if precedent set by other reuses of number and name were followed.

Number and this name reused for a replacement loco built at the Valparaiso workshops in 1887. See below.

New construction:

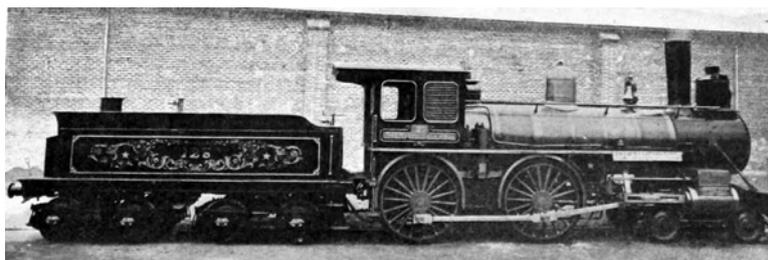
Tipo 32

4-4-0 d/w 1676mm 66", cyls. 381x609mm 15"x24", built by Lever Murphy in 1888

[1] says with 4 axle tenders and weighing 71551kg. The *DOP Memoria* for 1888 says these locos entered service in the first months of 1888.

- | | | |
|--------------------------------|-------|--|
| 126 'JOSÉ M. BALMACEDA' | w/n 1 | PM list says renamed ' La CONSTITUCIÓN ', presumably after Balmaceda's suicide at the end of the civil war. PCD concurs. Boiler rebuilt 1896. [8] shows pic after boiler explosion in 1903. Sr. Andres Thompson has written to say that this loco was almost completely destroyed in a fatal collision with loco 404 at the north end of the Las Palmas tunnel near Paso Hondo (between Viña del Mar and Quilpué) in December 1909 [Reported in <i>El Mercurio</i> of Santiago, December 11th 1909]. ' <i>Excluidas</i> ' in 1932 [3]. |
| 127 'CALETA ABARCA' | w/n 2 | Loco with this number ' <i>excluidas</i> ' in 1930 [3]. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3]. |
| 128 'I. M. URMENETA' | w/n 3 | Replacement reconditioned boiler fitted 1897 whilst working in 2nd section. ' <i>Excluidas</i> ' in 1932 [3]. |
| 129 'J. WHEELRIGHT' | w/n 4 | Boiler replaced by new 1896, and new cylinders fitted. Sold to <i>DOP</i> in 1929 [3]. In use by <i>DOP</i> on Loncoche-Villarica branch in 1930 [3]. |
| 130 'MIRAMAR' | w/n 5 | Sold to <i>DOP</i> in 1929 [3]. In use by <i>DOP</i> on Peleco - Puren line in 1930 [3]. |
| 131 'QUINTA' | w/n 6 | Loco with this number ' <i>excluidas</i> ' in 1930 [3]. Loco with this |

number sold to Braden Copper Co. in 1931 presumably for scrap [3].
 6 locos in class, **126-131**, in 1902 [19]. Six locos listed in post-1908 diagram book [24] on page 32 (?). 6 in active fleet around 1928 [36]. None in active fleet by 1939.



No. **126** after a boiler explosion in 1903. From Pablo Moraga's book *Tiempo de Trenes*.
 Note the shorter smokebox than that shown in the previous photo.

Ex FCCCiT Renaico-Victoria and Angol-Traiguén contract locos, absorbed into EFE in 1888

The contractor *Mayers y Hillman* had their contracts terminated prematurely owing to lack of progress. The locos listed in section 1.1.4 were taken into *EFE* stock at that point.

Tipo 16

4-4-0 d/w 1676mm 66", cyls. 381x559mm 15"x22", built by Rogers in 1884

132 'ARAUCANA' w/n 3473 ex FCCCiT Renaico-Victoria and Angol-Traiguén contract no. **1**
 Withdrawn 1921 [30]. To be withdrawn 1921 [*EFE memoria* 1920 p323]

133¹ 'GUANACO' w/n 3474 ex FCCCiT Renaico-Victoria and Angol-Traiguén contract no. **2**
 2 locos in fleet, **132-133**, in 1902 [19]. Listed in post-1908 diagram book [24], along with nos. **71-75**.

The number 133 was reused in 1909 for a tipo 20 4-4-0, see below.

Tipo 19

2-6-0 d/w 1422mm 56", cyls. 432x609mm 17"x24", built by Rogers in 1884

134 'ESPERANZA' w/n 3475 ex FCCCiT Renaico-Victoria and Angol-Traiguén contract no. **3**

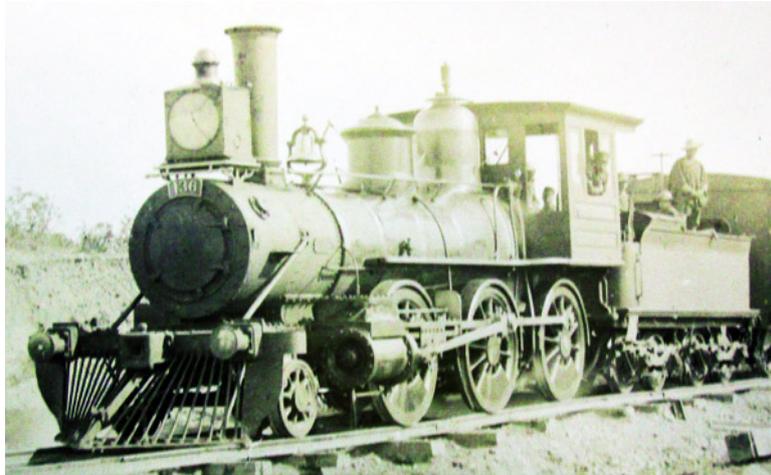
135 'ILUSTRACIÓN' w/n 3476 ex FCCCiT Renaico-Victoria and Angol-Traiguén contract no. **4**
 Loco with this number recorded as '*detenidas*' at San Bernardo (withdrawn?) during 1923 [3].

136 'CONSTANCIA' w/n 3479 ex FCCCiT Renaico-Victoria and Angol-Traiguén contract no. **5**. [26] says these next three locos had been ex FCCCiT Renaico-Victoria and Angol-Traiguén contract nos. **10-12**.

137 'ARTESANO' w/n 3480 ex FCCCiT Renaico-Victoria and Angol-Traiguén contract no. **6**

Withdrawn 1916 [30].

138 'INMIGRANTE' w/n 3481 ex FCCCiT Renaico-Victoria and Angol-Traiguén contract no. 7
5 locos in class, **134-138**, in 1902 [19], listed as '*de carga, pesados*', with d/w given as 57½". Listed in post-1908 diagram book [24] as a class containing nos. **81, 86, 89-91, 118, 134-138, 84-85**. 8 in fleet around 1928 [36] but listed as 'obsolete or knocked-down'.



No. **136** as seen in photo in the P. C. Dewhurst archive.

New construction by EFE's own workshops, but to pre-existing designs

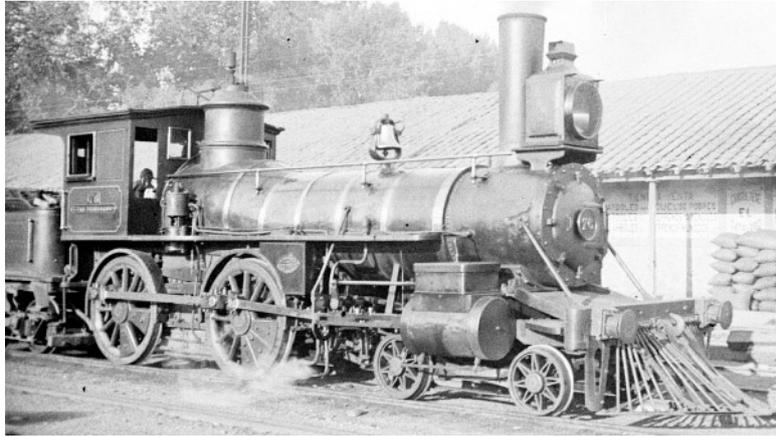
During the 1880s a number of engines were renewed or replaced in the railway shops, and one engine was obtained from a contractor [Copeland refers but gives no details]. In each case a number and name were transferred together from the previous machine, but the new engines were not necessarily of the same design or even wheel arrangement, though no doubt some parts may have been reused. It seems that some of these may have been 'accountants' rebuilds' much as the GWR used to perform in the UK, ie. the construction of a new engine but recorded as a rebuild for accounting purposes in order to get it past the auditors or shareholders.

67² 'MONTT'

Tipo 14 4-4-0 d/w 1676mm 66", cyls. 457x609mm 18"x24", Valparaiso shops, in 1887. The *DOP memoria* for 1888 says the d/w were 60". [AS, see appendix] wrote "The Valparaiso-built engine should I think be 1887, as I saw it in for repair of construction defects in April 1888 and it was a practically new engine_ The wheels had been put in reversed and it ran forward with lever in back gear_ George Brunton said that was intentional and left it so!!! result it went into the turntable pit several times_" In 1st March 1888 or 1889 (unclear) the loco '**MONTT**' collided with the back of goods train 8 near the Maipo bridge, the fault being with the driver of that loco. A loco **67** was leased to the *FC Quintero* (sic) near Valparaiso in 1929 and 1930. [3]. 1 loco in class, **67**, in 1902 [19], listed as '*ordinarios, lentos*', and with d/w given as 60". Listed in post-1908 diagram book [24] along with **125, 82**, and **222**. Two *tipo 13* or *14* locos that had been built in 'Maestranza 1st zone' workshops were still listed around 1928 [36], 1 as 'obsolete or knocked-down' and 1 as 'rented or loaned'. Withdrawn 1934?

76² 'SAN BERNARDO'

Tipo 17 4-4-0 d/w 1422mm 56", cyls. 419x609mm 16½"x24", Santiago workshops, in 1888. The 1889 *DOP memoria* seems to say 6-coupled but this must be a mistake. New tender 1888 or maybe 1892. Ran 72,876km in 1896. In use by *DOP* in 1911, and by them on Cajon to Llaima in 1914 [2], also possibly in 1920? On hire to *DOP* in 1920 [*EFE memoria* 1920 p323]. 2 locos in class, **76-77**, in 1902 [19], listed as '*de carga, livianos*', and with d/w given as 57".



There is an amateurish look about no. **76** which confirms that it was not a product of one of the big builders. The bogie wheels are of wrought iron with split spokes, and the driving wheels have bolted-on balance weights of an unusual pattern. Neither the smokebox, the cabside nor the handrails conform to any recognised standard.

82² 'CONTRATISTA'

Tipo 14 (but 1902 list was annotated to say *tipo 30*). **4-4-0** d/w 1676mm 66", cyls. 457x609mm 18"x24", *Valparaiso work shops, in 1886*. The 1889 *DOP memoria* confirms the reconstruction was at the

Valparaiso shops but implies it took place in 1888. It also says d/w 57". However AS wrote: "The new engine was built in Valparaiso in 1886 or thereabouts, as it had a general overhaul in 1891." [1] suggests the replacement was built using the parts of a Sturrock steam tender to create a 4-4-0 similar to '**67 MONTT**'. [2] says new tender in 1888. 1 loco in class, **82**, in 1902 [19]. Listed in post-1908 diagram book [24] along with **67**, **125** and **222**. Withdrawn 1915 [30], but see note above under no. **67**.

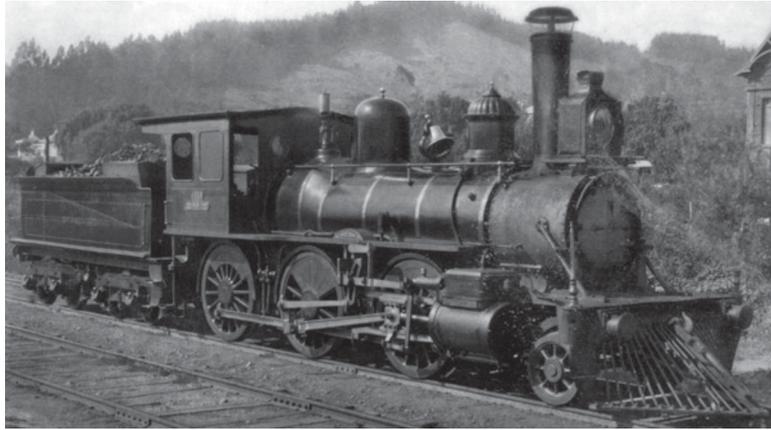
105³ 'SAN CARLOS'

Tipo 20 **4-4-0** d/w 1676mm 66", cyls. 445x609mm 17½"x24", *built by Rogers, ex contractor, 1884*. No obvious 5' 6" gauge candidates in Rogers list. *Number 105 reused for a new loco (probably tipo 20) between 1909 and 1912. See below.*

116² 'LAJA'

Tipo 28 **2-6-0** d/w 1422mm 56", cyls. 432x609mm 17"x24", *Valparaiso work-shops, in 1886*. 1 loco in class, **116**, in 1902 [19], listed as '*de carga, pesados*', with d/w given as 57½". One unknown source suggested this came from the *Red Norte* as '**RENAICO**' but see notes about use in Coquimbo later in paragraph. Listed on its own in post-1908 diagram book [24]. This loco was overhauled (or built as new according to Arturo Squire) in Concepción at some time between 1910-15 and then sent north sent to Coquimbo. It returned to Cabritería workshops at Valparaíso in July 1917 and was resent to Coquimbo in August 1918 [PMF]. However, these final dates seem unlikely as the Coquimbo broad gauge ceased operation in 1916. Loco with this number recorded as '*detenidas*' at San Bernardo (withdrawn?) during 1923 [3]. Sold to Braden Copper Co. in 1929 [3], presumably for scrap.

1 loco of *tipo 28* in fleet around 1928 [36], but listed as 'obsolete or knocked-down'.



122² 'VARAS'

Tipo 23 2-6-0 d/w 1422mm 56" , cyls. 432x609mm 17"x24" , Santiago workshops, in 1886. [1] says **122** was built at Caleta Abarca (ie. at Lever Murphy), possibly around 1890, weighing 65000kg. 1 loco in class, **122**, in 1902 [19], listed as 'de carga, pesados', with d/w given as 57". Listed together with nos. **94-96** in post-1908 diagram book [24]. Withdrawn 1921? This is puzzling as the name 'VARAS' had been transferred to a new FCCCiT / FCS Rogers 2-6-0 in 1883. Why would that loco have been replaced after only seven years? [AS, see appendix, wrote] "0-6-0 Hawthorn, was still going in 1901. now this # corresponds to a local factory engine". However, it is clear that AS (and presumably other old EFE staff) sometimes tended to describe locos by what they looked like, rather than their actual builder.

123² 'MALLECO'

Tipo 27 2-6-0 d/w 1422mm 56" , cyls. 457x609mm 18"x24" , Concepción workshops, in 1887. Confirmed by [1]. [AS, see appendix, wrote] "123 'Malleco' was a Rogers 2-6-0 18"x24" , 58" d. wh." but he may well have been meaning "Rogers style" or even "built from Rogers spares". New boiler in 1892 [DOP mem 1892B] when in service in Section 3. New cylinders 1896. 9 locos in class, **107-114, 123**, in 1902 [19], listed as 'de carga, pesados', with d/w given as 57". Same nine locos listed in post-1908 diagram book [24]. 8 in fleet around 1928 [36] but listed as 'obsolete or knocked-down'. Sold to Braden Copper Co. in 1929 [3], presumably for scrap.

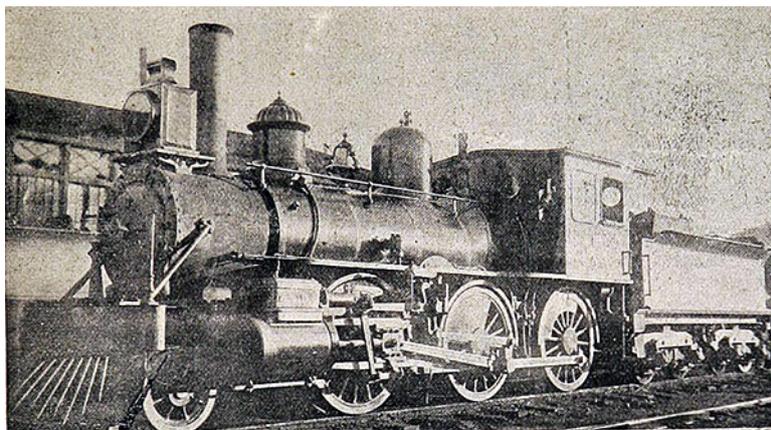


Photo from Sucesos issue 520 in 1912, probably this loco as was captioned as built in Concepción. Note that both this engine and no. **116** pictured above are seen with outside Walschaert's valve gear actuating the slide valves. This would be unusual for such early locos, but perhaps they were later rebuilt.

124² 'PANGUILEMO'

Tipo 31 4-4-0 d/w 1422mm 56" , cyls. 419x609mm 16½"x24" , Santiago workshops, in 1888. [1] confirms **124** built Santiago shops in 1888 as a 4-4-0 with 4 axle tender

weighing in total 59046kg. [AS, see appendix] confirms location, American type, and year. Used by *DOP* in 1896, 1904-5 (Melipilla to Puangue), 1910 (Melipilla to San Antonio), 1911 arrived to shunt at Saboya for Cap. Pastene works, 1912 back to *EFE?*, 1914 (Cajon to Llaima), 1920 (still with *DOP* but location unknown) [2] [3].

On hire to *DOP* in 1920 [*EFE memoria* 1920 p323]. 4 locos in class, **78-80, 124**, in 1902 [19], listed as '*de carga, livianos*', and with d/w given as 57 3/8". Listed in post-1908 diagram book [24] on its own.

125² 'ANGEL PRIETO i CRUZ' Tipo 14 4-4-0 d/w 1676m 66", cyls. 457x609mm 18"x24", Valparaiso workshops, in 1887. The *DOP memoria* for 1888 says the d/w were 60". [1] confirms a replacement **125** was built in 1886, using the parts of a Sturrock steam tender to create a 4-4-0 similar to '**67 MONTT**'. [7] also says this was '**ANGEL PRIETO CRUZ**' and built at Valp. Shops in 1887. [AS] also believed built in Valparaiso and from spares. 1 loco in class, **125**, in 1902[19], listed as '*ordinarios, lentos*', and with d/w given as 60". Listed in post-1908 diagram book [24] along with **67, 82**, and **222**. Withdrawn 1915 [30].

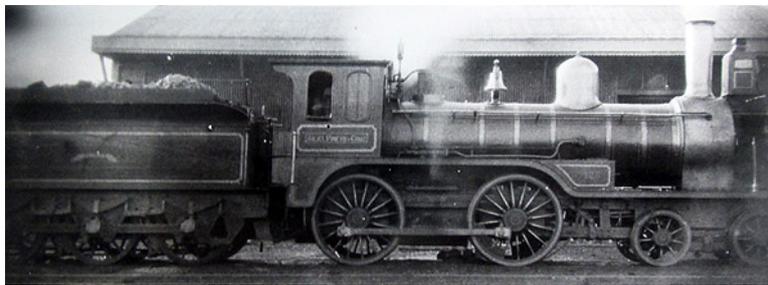


Photo from P. C. Dewhurst collection, and possibly taken by Arturo Squire.

Size of fleet in 1888

<i>DOP memoria</i> 1888 says fleet included	English locos:	22 pass, 34 <i>carga</i> , 5 special duties.
	American locos:	30 pass, 37 <i>carga</i> , 4 special duties.
	Total;	132.

New construction to new designs

Tipo 21 (4th batch +)
2-6-0 d/w 1372mm 54", cyls. 432x609mm 17"x24", built by Lever Murphy in 1888-9

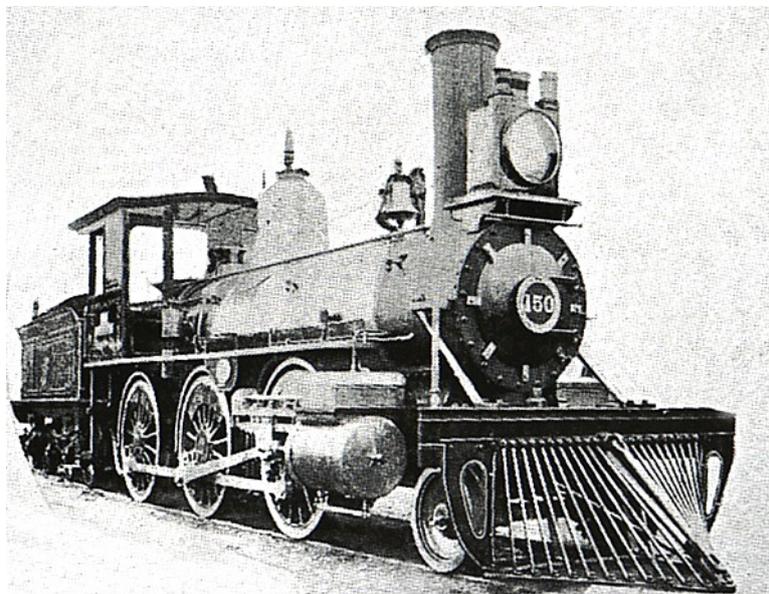
Tenders to build these locos had been received in early 1888 from Esslingen, Rogers, Baldwin, LM, BL and later from Dübs & Neilson working together [43]. [6] suggests these may have been constructed by Rogers but assembled by Lever Murphy. Unlikely. *Decreto* no. 20 of 27th April 1888 accepts LM's tender with no mention of Rogers' involvement. All parts except wheels, axles, injectors and air-brakes are to be made within Chile. 4 locos due within 6 months, another 4 within 8 months, and the remaining 4 within 12 months. [43] Lever Murphy's quote was 11.75% higher than the lowest overseas quote, that of *Grace y Cía* acting for Baldwin.

A photo seemingly showing no. **146** has the dome very far forward, behind what seem to be transversely-paired chimneys, and with a pump of some kind mounted in front of the cab on the right hand running board with its own chimney.

139 'GUÍNDOS' w/n 7 Started work December 1888. New cylinders 1896 when working in *Zona II* (MSE). Awaiting fitting of new boiler 'tipo Vulcan Foundry', which had arrived at Santiago, in Sept. 1907. Loco with this no. sold to *Ministerio de Marina* in 1929 [3].

140 'GRANEROS' w/n 8 Started work December 1888. Tender rebuilt 1896, also new cylinders fitted.

- Working in *Zona III* (MC) at this time. Listed under *Zona III* (MC) in 1941, 1942, 1951 & 1955.
- 141 ‘CAUQUÉNES’** w/n 9 Started work December 1888. Listed under *Zona III* (MC) in 1939, 1942 & 1942. Loco with this number sold in 1943 [3].
- 142 ‘ROSARÍO’** w/n 10 Started work January 1889. New cylinders 1897 whilst working in *Zona III* (MC). Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 143 ‘HUAÍQUILLO’** w/n 11 Started work January 1889. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 144 ‘CAMARÍCO’** w/n 12 Started work January 1889. New/reconstructed tender 1892, also new cylinders. Listed under *Zona III* (MC) in 1939, 1941 & 1942. Loco with this number sold in 1943 [3].
- 145 ‘SAN RAFAEL’** w/n 13 Started work January 1889. One new cylinder 1892. Replacement reconditioned boiler fitted 1897 whilst working in *Zona II* (MSE). New cylinders 1897. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 146 ‘SAN JAVIER’** w/n 14 Started work January 1889. New cylinders 1896. Awaiting fitting of new boiler ‘*tipo Vulcan Foundry*’, which had arrived at Santiago, in Sept. 1907. Listed under *Zona III* (MC) in 1939, 1941 & 1942. Listed under *Zona I* (MByC) in 1951 and 1955.
- 147 ‘ACHIBUENO’** w/n 15 Air brake fitted 1896, when running in *Zona II* (MSE). Replacement reconditioned boiler fitted 1897 whilst working in 2a section. Awaiting fitting of new boiler ‘*tipo Vulcan Foundry*’, which had arrived at Santiago, in Sept. 1907. Withdrawn 1919 [30].
- 148 ‘MEMBRILLO’** w/n 16 Boiler replaced by new when working in *Zona II* (MSE) in 1896. Collided with a goods train near Paine on 21 August 1896, 3 fatalities. Withdrawn 1919 [30].
- 149 ‘TUMBEL’** w/n 17 New cylinders 1897 whilst working in *Zona II* (MSE). Loco with this number ‘*excluidas*’ in 1930 [3].
- 150 ‘VICTORIA’** w/n 18 Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 12 locos in class, **139-150**, in 1902 [19], listed as ‘*de carga, pesados*’, with d/w given as 57 5/8". Listed in post-1908 diagram book [24] as a class containing nos. **87-88, 139-150, 151-164, 119, 93**. 24 locos of *tipo 21* in 1922 list [34], 18 in *Zona III* and 6 in *Zona IV*. 23 locos in fleet around 1928 [36], 20 active, 2 'obsolete or knocked-down' and 1 'rented or loaned'. 17 locos in fleet in 1955, and in 1957 [49]. One loco still in fleet list in 1965 and 1968 [*EFE memorias anuales*].



Tipo 21 no. **150 'VICTORIA'**. Identification features of this batch include the British style dome and safety valve bonnet, the sandboxes at running board level, and the disk type pony truck wheels. Photo from Pablo Moraga's collection.

Tipo 21 (5th & last batch)
2-6-0 d/w 1448mm 57", cyls. 432x609mm 17" x24", built by Vulcan Foundry in 1890

Part of the big contract via Antony Gibbs & Sons, dated May 27 1889. Described as *tipo 'Americanas'* equal to those built by Lever Murphy. VF original list specifies fitted with bar frames. The VF photo displayed below has one of these engines carrying the name '**EI PRESIDENTE**'. Whilst this name does not appear in the list here, the Chilean civil war (between supporters of the President and supporters of the country's Congress) occurred shortly after these locos had entered service, culminating in victory for Congress and the suicide of President José Manuel Balmaceda. In the circumstances, perhaps this name was quickly replaced by something less contentious. A letter from VF's General Manager to P. C. Dewhurst in June 1924 refers to these engines as having been built under makers working nos. 660 and 661, which may mean the contract numbers.

151 'ÑIQUÉN'	w/n 1270	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
152 'QUILACOYA'	w/n 1271	Withdrawn 1918 [30].
153 'CHIQUAYANTE'	w/n 1272	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
154 'DIUQUÍN'	w/n 1273	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
155 'COIGÜE'	w/n 1274	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
156 'MULCHÉN'	w/n 1275	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
157 'ROBLERÍA'	w/n 1276	Awaited fitting of new boiler ' <i>tipo Vulcan Foundry</i> ', which had arrived at Santiago, in Sept. 1907. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
158 'MININCO'	w/n 1277	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
159 'TRINTRE'	w/n 1278	Loco with this number dismantled 1923 [3].
160 'QUILQUÉN'	w/n 1279	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
161 'TRIGAL'	w/n 1280	Leased to <i>DOP</i> in 1933 [3]. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
162 'TRAIGUÉN'	w/n 1281	Loco with this number ' <i>excluídas</i> ' in 1930 [3].
163 'ERCILLA'	w/n 1282	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
164 'CAUTÍN'	w/n 1283	Tender rebuilt 1896.

14 locos in class, **151-164**, in 1902 [19], listed as '*de carga, pesados*', with d/w given as 57 5/8". Listed in post-1908 diagram book [24] as a class containing nos. **87-88, 139-150, 151-164, 119, 93**. 24 locos of *tipo 21* in 1922 list [34], 18 in *Zona III* and 6 in *Zona IV*. 23 locos in fleet around 1928 [36], 20 active, 2 'obsolete or knocked-down' and 1 'rented or loaned'. 19 locos in active fleet in 1941 & 1942 [37]. 17 in fleet in 1951 & 1955. One loco still in fleet list in 1965 [EFE memoria anual]. 17 in active fleet in 1958 but only 1 left in 1968 [49].

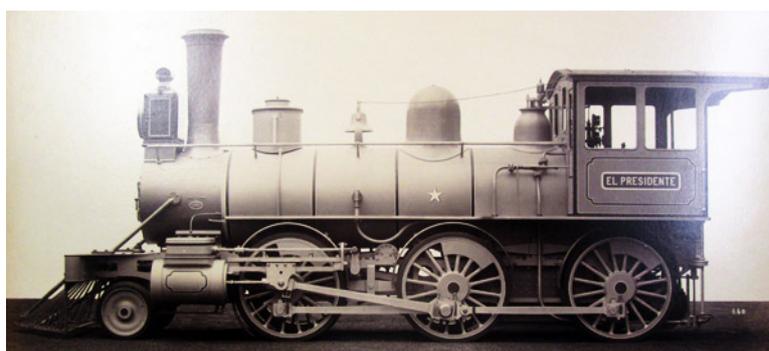


Photo from Vulcan Foundry album at Merseyside Maritime Museum.

Tipo 33

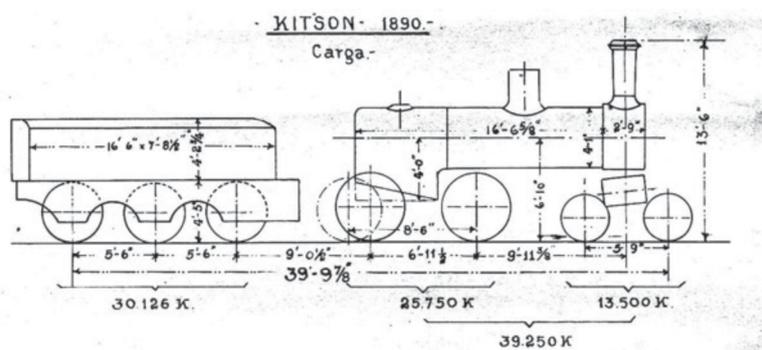
(1st & only batch)

4-4-0 d/w 1422mm 56", cyls. 457x660mm 17½"x24", built by Kitson in 1890

Part of the big contract via Antony Gibbs & Sons, dated May 27 1889. Described as *tipo* 'Avonside'. Merte's Kitson list by Brian Rumary shows these as built for the Buenos Aires Northern Railway. It is apparent from the *EFE* diagram book that several of these engines were '*reformada*' around 1898 with the rear driving wheels moved back by 18½" and given replacement boilers with deeper fireboxes, though otherwise their layout as inside-cylindereed 4-4-0s remained the same. It seems likely that three of the class were so treated, probably **166-8**. The date and purpose of this work is unknown.

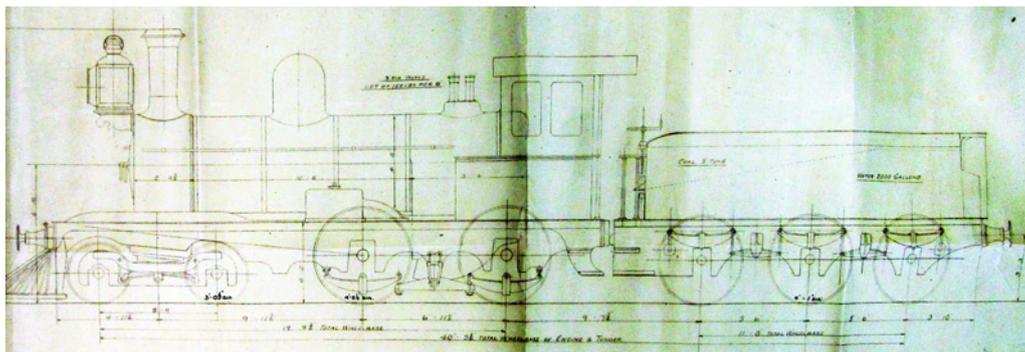
165¹ 'SANTA FÉ'	w/n 3233	Sold to the <i>FC Arauco</i> , date unknown. [3]. Number reused in 1908 for a new <i>tipo</i> 34 2-6-2T. See below.
166 'CANDELARIA'	w/n 3234	Tender rebuilt 1896. Withdrawn 1921 [30].
167 'COLLIPULLI'	w/n 3235	Loco with this number recorded as ' <i>detenidas</i> ' at MSB (withdrawn?) during 1923 [3].
168 'Los SAUCES'	w/n 3236	Tender rebuilt 1896. Withdrawn 1921 [30].
169 'IMPERIAL'	w/n 3237	New cylinders 1892 when in service in section 3. Withdrawn 1919 [30].
170¹ 'CHILOÉ'	w/n 3238	Sold to the <i>FC Arauco</i> , date unknown. Number 170 reused in 1908 for a new <i>tipo</i> 34 2-6-2T. See below.
171 'MAGALLANES'	w/n 3239	Loco with this number in course of dismantling 1923 [3].
172 'COVADONGA'	w/n 3240	In use by <i>DOP</i> on Temuco to Carahue in 1902 [2]. Loco with this number in course of dismantling 1923 [3].

8 locos in class, **165-172**, in 1902 [19], listed as '*de carga, livianos*', and with d/w given as 56½". Six (sic) locos, **166-172** (actually seven), were listed in post-1908 diagram book [24] on page 33 (?). However, if note above at **170** is correct then maybe that number should have been omitted from the diagram book, and the total of six given may reflect that fact. 1 loco in fleet around 1928 [36], but listed as '*obsolete or knocked-down*'. Another AS annotation in the diagram book says that **165** and **170** were sold to the Arauco Railway. This will have been only shortly before the arrival of the two brand new Lima 2-6-2Ts from the *Cía. Carbonifera de los Ríos de Curanilahue* which then gained the numbers **165** and **170** in their place.

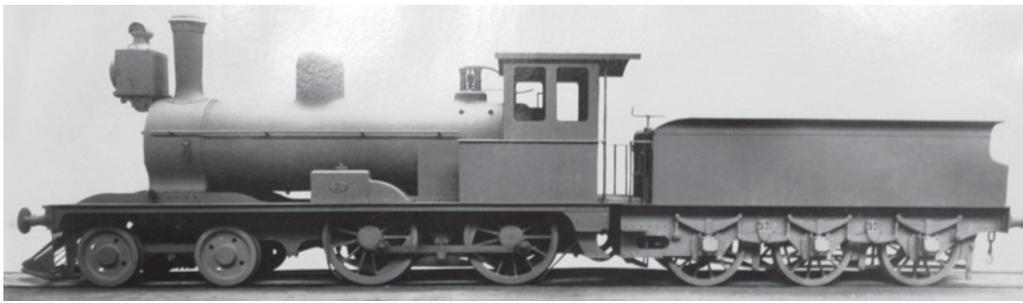


Sketch is from post-1908 *EFE* diagram book, in the SLS library file LD1896.

Note the longer driving wheelbase, shown using dotted lines, applicable to the rebuilt engines.



A Kitson diagram of *tipo* 33 from the P. C. Dewhurst collection at the NRM in York.



A Kitson builders' photo showing one of these locos in a strangely low key photographic grey livery.



No. 167 'COLLIPULLI' after rebuilding with a longer fixed wheelbase and also a longer cab.

Tipo 35

(1st & only batch)

0-4-2 d/w 1473mm 58" (SS docs. say d/w 56½"), cyls. 457x609mm 18"x24", built by Sharp Stewart in 1890

Built as SS order E953 of 27th June 1889, for use on the El Tabón incline. Part of the big contract via Antony Gibbs & Sons, dated July 8 1889 (date needs checking, different from that quoted for other locos above, and strangely later than NBL order book date). Described as *tipo* 'Pilot' *remolcadora*. Original order book notes say steel wheels; tyres Vickers, Krupp or Cammell; boiler of best mild steel plates except tube plate B. G. (?) and copper firebox and brass tubes. Also 'Westinghouse brake on tender and train only, No brake on engine', but this was altered later to add Westinghouse brake on the engine too.

Note the replacement works numbers of the four last shown below. The original locos were lost when the SS *Gulf of St. Vincent* ran aground on a hitherto unmarked rock north of Holyhead, Anglesey, UK, on 19th July 1890. Sharp Stewart 3764-3767 were identical, and were built as SS order E992 of December 26 1890 to replace the original four which had been lost. The SS order book notes "In all respects as E953. Certain salved parts of order E953 to be used." These replacement locos arrived 1892, and were listed in a *DOP memoria* as nos. **177-180**.

173 'ELEUTERIO RAMIREZ'	w/n 3590	Loco with this number ' <i>excluidas</i> ' in 1930 [3]. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3].
174 'TARAPACÁ'	w/n 3591	Boiler rebuild 1897 whilst working in 1st section. Loco with this number ' <i>excluidas</i> ' in 1930 [3]. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3].
175 'Los MAYOS'	w/n 3592	Boiler rebuild 1897 whilst working in <i>Zona I</i> (MByC). Withdrawn in 1936 [30].
176 'MARGA MARGA'	w/n 3593	Loco with this number ' <i>excluidas</i> ' in 1930 [3]. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3].
177 'CON CON'	(w/n 3594)	(Replaced by SS no. 3764). Renamed ' LAS PALMAS ' at some point? though 1892B <i>memoria</i> gives it that name from new. The name ' CON CON ' may have been a post civil war renaming, according to a pencil annotation in Arturo Squire's list in the P. C. Dewhurst collection. ' <i>Excluidas</i> ' in 1932 [3].
178 'SIETE de ENERO'	(w/n 3595)	(Replaced by SS no. 3765). Renamed ' SAN ISIDRO ', renamed again after the civil war to ' REVOLUCIÓN '. Loco with this number ' <i>excluidas</i> ' in 1930 [3]. Loco with this

179 'Los LOROS'

(w/n 3596)

number sold to Braden Copper Co. in 1931 probably for scrap [3]. (Replaced by SS no. 3766). Involved in collision on April 25th 1894 when locos **13** and **179** collided with *tren ordinario de pasajeros* no. 6 standing still near Los Loros [61]. Five dead. Loco with this number '*excluidas*' in 1930 [3]. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3].

180 'PANQUEHUE'

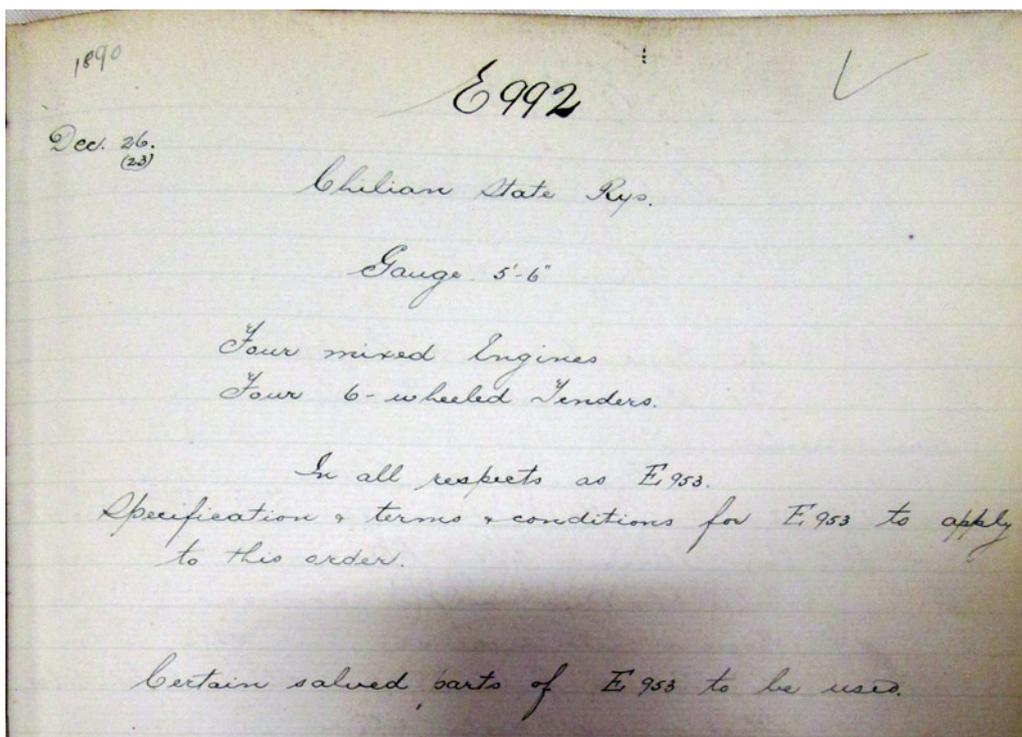
(w/n 3597)

(Replaced by SS no. 3767). Loco with this number '*excluidas*' in 1930 [3]. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3].

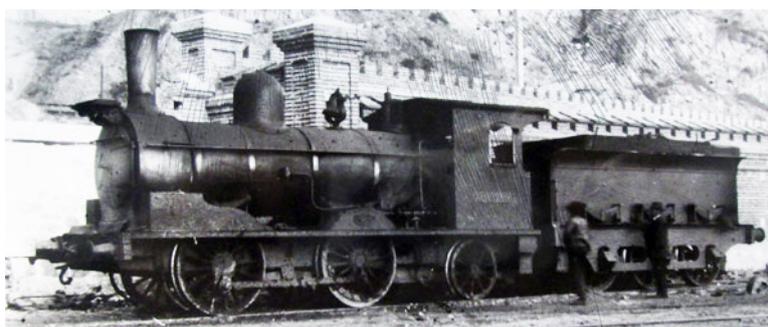
8 locos in class, **173-180**, in 1902 [19], listed as '*de carga, livianos*'. 1902 list says d/w 58" for all. Eight locos listed in post-1908 diagram book [24] on page 34 (?). 8 in class in 1921, all in the *I zona*. 8 in fleet around 1928 [36], 6 in active fleet and 2 '*obsolete or knocked-down*'. None in active fleet by 1939/1942.



Sharp Stewart builder's pic



The order E992 page from Sharp Stewart's order book, stating that "Certain salved parts of E903 to be used.



A tipo 35 0-4-2, but with a different tender and cab. Photo from the P. C.

Dewhurst collection, possibly by Arturo Squire and from around the time of the First World War.

Tipo 44 (Expreso)

(1st batch +)

4-4-0 d/w 1676mm 66", cyls. 445x609mm 17½" x 24", built by Neilson in 1889

Part of the big contract via Antony Gibbs & Sons, dated February 1889. Described as tipo 'expreso'. Neilson order no. E650 dated 12/2/1889. The Neilson order book says that cyls. for this batch were 17 1/8" x 26". Delivery was to be within 23 weeks, ie. by the 23rd July 1889. Note straight-topped boiler on this batch.

181 'NOS' w/n 3950 Replacement reconditioned boiler fitted 1897 whilst working in Zona II (MSE). Probably hauled special train on *FC de Arauco* conveying US envoy Mr. E. Root from Lota in Sept. 1906. Loco with this number 'excluídas' in 1930 [3]. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3].

182 'PAINE' w/n 3951 Withdrawn 1918 [30].

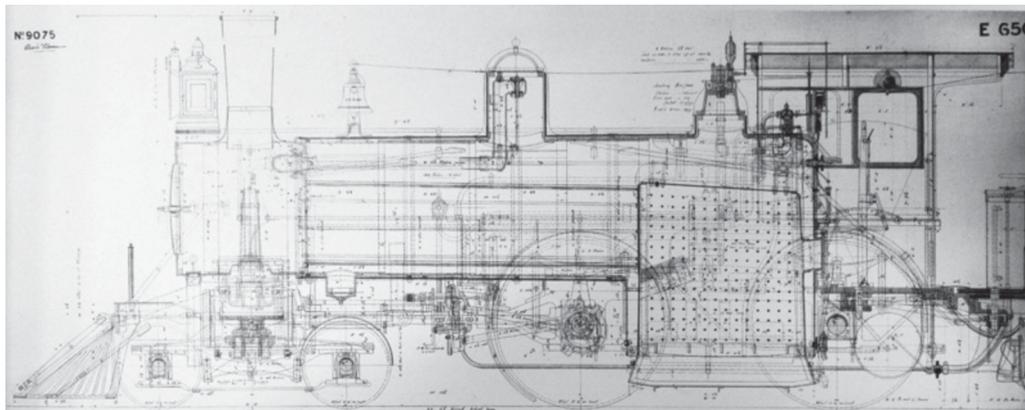
183 'ANGOSTINA' or 'ANGOL'? w/n 3952 Sold to Braden Copper Co. in 1929 [3], presumably for scrap.

184 'CHIMBARONGO' w/n 3953 Loco with this number 'excluídas' in 1931 [3].

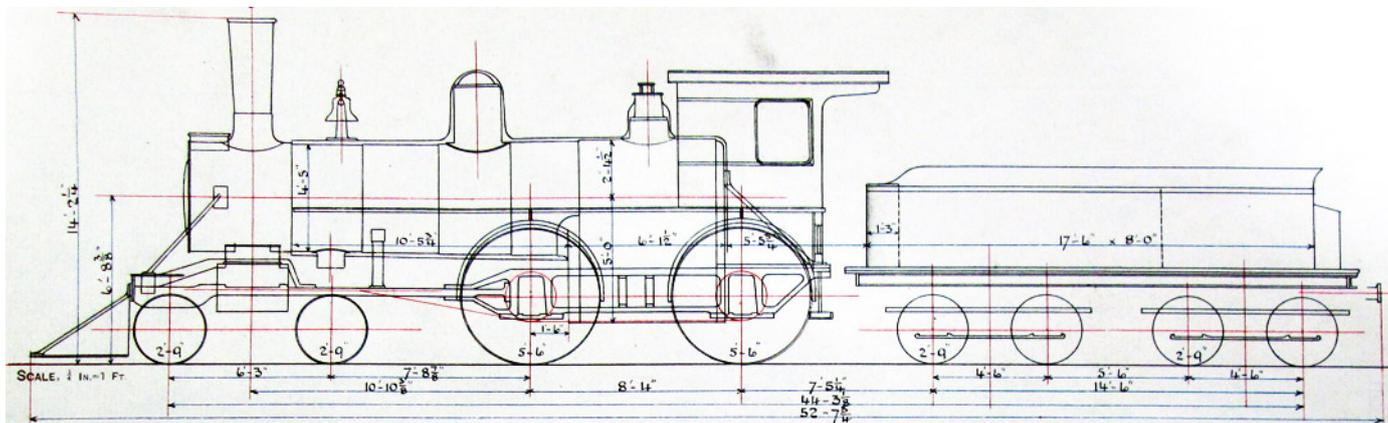
4 locos in class, **181-184**, in 1902 [19]. Nine locos listed in post-1908 diagram book [24] on page 42 (?), as nos. **243-246, 181-184**, and **120**, and with supposedly 18 more being constructed at that time. However, seven listed as in active fleet around 1928 [36]. None in active fleet by 1939/1942.



Neilson builder's pic



A GA drawing of the tipo 44 Neilson locos. High resolution versions are available from



Tipo 36

(1st & only batch)

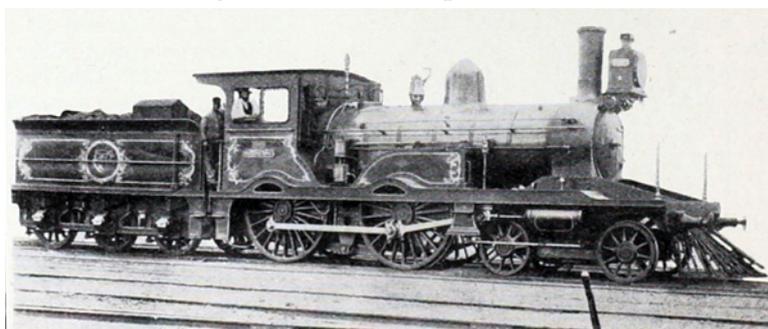
4-4-0 d/w 2007mm 79", cyls. 457x609mm 18"x24", built by Dübs in 1890

Part of the big contract via Antony Gibbs & Sons, dated May 27 1889. Described as *tipo* 'Adams' so presumably had an Adams radial bogie or axleboxes, probably the former. Dübs order no. 2561. Names mostly related to the War of the Pacific. These engines had the largest driving wheels ever used on the *EFE*.

185 'ARTURO PRAT'	w/n 2561	'Excluidas' in 1932 [3]. 'Desarmadas' 1933 [3].
186 'CARLOS CONDELL'	w/n 2562	Loco with this number 'excluidas' in 1931.
187 'IGNACIO SERRANO'	w/n 2563	Ran 79,219km in 1896. This loco had highest mileage (100,810km) of any in <i>Zona 2</i> during 1907 [41]. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3], but possibly still in service at that time, just [3].
188 'ERNESTO RIQUELME'	w/n 2564	Loco with this number 'excluidas' in 1930. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap.
189 'SARJENTO ALDEA'	w/n 2565	'Excluidas' in 1932 [3].
190 'PATRICIO LYNCH'	w/n 2566	'Excluidas' in 1932 [3]. 'Desarmadas' 1933 [3].
191 'BLANCO ENCALADA'	w/n 2567	'Excluidas' in 1932 [3].
192 'COCHRANE'	w/n 2568	Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3], but possibly still in service at that time, just [3].
193 'ESMERALDA'	w/n 2569	Loco with this number 'excluidas' in 1930 [3]. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3].

9 locos in class, **185-193**, in 1902 [19], listed as '*Expresos, Americano construida en Inglaterra*'. Nine locos listed in post-1908 diagram book [24] on page 30 (?). 9 in class in 1921, all in the 3rd zone. 9 in active fleet around 1928 [36]. None in active fleet by 1939/1942.

During 1899, 1900 and 1902 a series of accidents befell the bridge over the Río Claro, just north of Talca. The original bridge was washed away, and then in succession two temporary replacement bridges suffered the same fate. On the third occasion, on the 25th June 1902, one of these Dübs 4-4-0s ended up in the river, but despite being completely covered by the shifting sands of the river bed, was presumably salvaged in due course as all nine were still in service many years later [*Railway & Locomotive Engineer*, Nov. 1902, p463].



Dübs builder's photo, reproduced in the *Railway Magazine* of March 1908.

Tipo 37

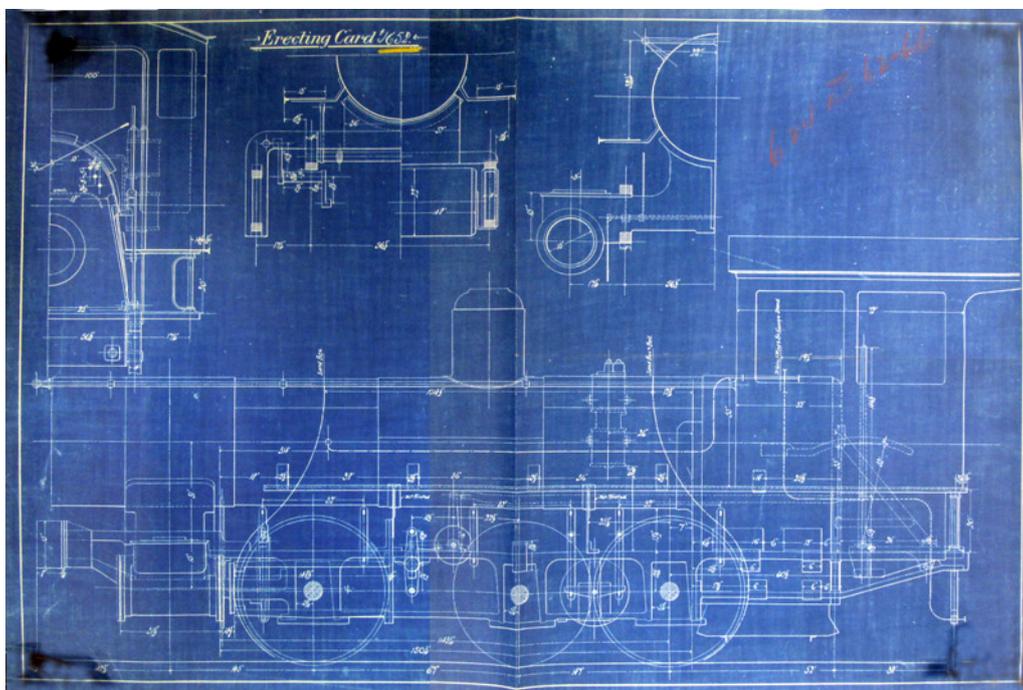
(1st & only batch)

0-6-0 d/w 1143mm 45", cyls. 381x609mm 15" x24", built by Baldwin in 1889

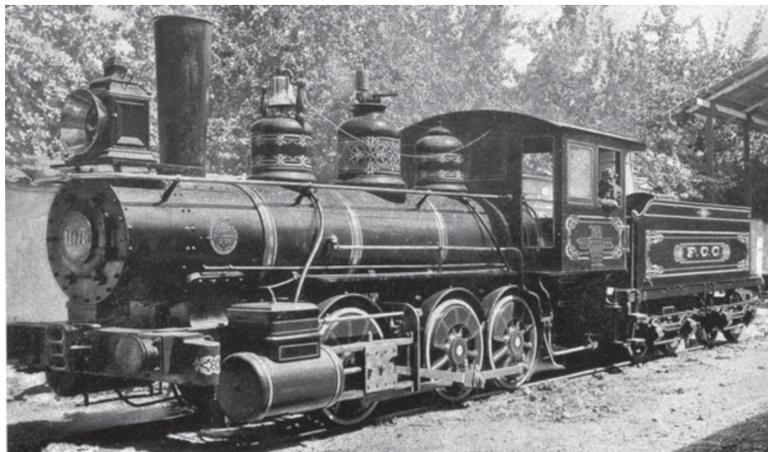
Class 6 24D 62-66. Spec. is in vol. 15 p119. Cab of sheet iron 1/8" thick. Buffers to be put on by company (ie. rather than by Baldwin). Sand boxes front and back 23", bell on back one.

194 'MATUCANA'	w/n 10122	Loco with this number recorded as 'detenidas' at San Bernardo (withdrawn?) during 1923 [3].
195 'LO ESPEJO'	w/n 10125	Loco with this number loaned to 'Obras Puerto de San Antonio' in 1923 [3].
196 'AGUILA'	w/n 10126	[8] pic of loco in a highly decorative livery. Loco with this number loaned to 'Obras Puerto de San Antonio' in 1923 [3].
197 'CONDOR'	w/n 10130	Sold to Braden Copper Co. in 1929 [3], presumably for scrap.
198 'HUEMUL'	w/n 10131	Loco with this number recorded as 'detenidas' at San Bernardo (withdrawn?) during 1923 [3].

5 locos in class, **194-198**, in 1902 [19], listed as 'maniobras'. Five locos listed in post-1908 diagram book [24]. 1 loco in fleet around 1928, but listed as 'obsolete or knocked-down' [36]. None in active fleet by 1939/1942.



A Baldwin erecting card drawing of these locos, from the P. C. Dewhurst collection in the NRM in York.



No. 196 'AGUILA'. The bell is on the front sand-dome, rather than the rear one as specified in the BLW spec.

Loco names

The regular naming of all engines ceased at this point.

Locos in fleet in 1892

Information from [*DOP memoria* 1892B]:

Americanos: pasajeros 29, *carga* 69, *especiales* 4. The 1891 figures had been: 39, 60, 11.

Ingleses: pasajeros 21, *carga* 58, *especiales* 15. The 1891 figures had been: 20, 65, 0.

Tipo 22

(2nd & last batch)

0-6-0ST d/w 1270mm 50", cyls. 330x559mm 13"x22", built by Rogers in 1893

Rogers order no. J-1474 1-8 shipped May 1893. Some of these Rogers locos of this or the following type arrived at Valparaiso on board the SS *Coya* in August 1893. All seem to have arrived during 1893 [*DOP memoria* 1893-4 p145]. Rogers notes in PCD archive give special features as: water gauge, no pumps, safety valve lockup.

199	w/n 4859	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955. Withdrawn 1957 [38].
200	w/n 4860	
201	w/n 4861	Loco with this number in course of dismantling 1923 [3].
202	w/n 4862	
203	w/n 4863	Loco with this number dismantled 1923 [3].
204	w/n 4864	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
205	w/n 4865	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955. At MSB in 1974 [10]. Preserved at Parque Quinta Normal in Santiago.
206	w/n 4866	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.

9(?) locos in class, **92, 199-206**, in 1902 [19], listed as '*maniobras*', cyls. given as 13"x24". Nine locos listed in post-1908 diagram book [24] on page 31 (?). 9 in class in 1921, all in the II *zona* [34]. 4 in active fleet around 1928 [36]. 4 in active fleet in 1941, 1942 & 1955 [37], and in 1957 [49]. One loco still in fleet list in 1965 and 1968 [*EFE memorias anuales*].



MCC's own photo, taken at the Parque Quinta Normal. Cab is different from that shown in diagram book, see no. **92** above.

Tipo 38 (de carga, pesados)

(1st batch +)

4-6-0 d/w 1422mm 56", cyls. 457x609mm 18"x24", built by Rogers in 1893

Ordered by Decree of 3rd October 1893 through Brown Beeche & Co. who had tendered for these 12 locos at a price of 38,936 Pesos each and with completion in 75 days. This was the cheapest tender, but Lever Murphy had made a very close bid and since that would benefit national industry it too was accepted. See a couple of pages further on. Rogers order no. J-1491 1-12 shipped Nov. 1893. Rogers notes in PCD archive include special features as: dome finished cast iron & sheet steel, all wheels wrought iron, 3 gauge cocks, grate (of) cast iron in groups stationary, 2 injec-

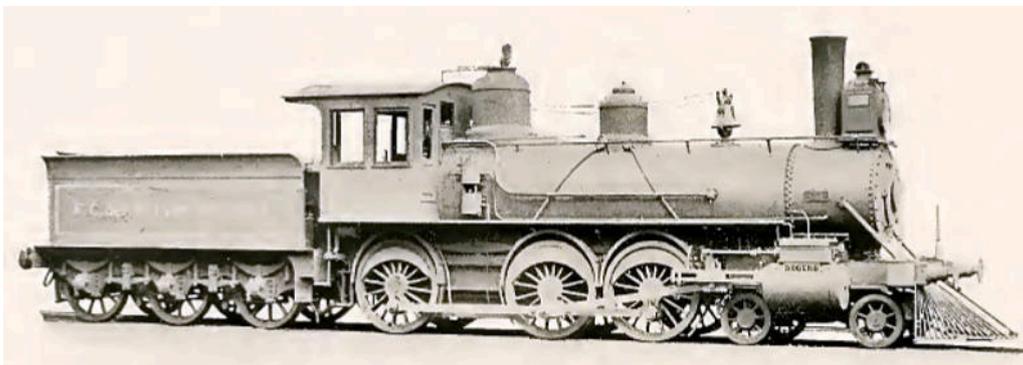
tors, 1 spring balance and 1 lockup safety valve. NB Many, if not all, of these engines were later rebuilt with ‘bolt-on’ piston valve chests in the same way as locos of *tipos* 57 and 58.

207	‘JUAN RAMON VARGAS’	w/n 4951	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
208		w/n 4952	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
209		w/n 4953	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
210		w/n 4954	Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
211		w/n 4955	Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955. At MSB in 1974 [10]. Preserved at Parque Quinta Normal in Santiago.
212		w/n 4956	Loco with this number engaged in electrification works train duties in 1923 [3]. Transferred to <i>DOP</i> in Feb 1932 [3]. Not in <i>EFE</i> lists 1939, 1941, 1942, or 1951.
213		w/n 4957	Listed under <i>Zona</i> III (MC) in 1939, 1941 & 1942. Withdrawn 1947. Sold at that time to <i>Cía. Carbónifera de Lota</i> , possibly for the Mina Plegarias which was at the railhead south of Curanilahue.
214		w/n 4958	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
215		w/n 4959	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
216		w/n 4960	Loco with this number engaged in electrification works train duties in 1923 [3]. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
217		w/n 4961	Supervised by San Eugenio 1939, 1941 & 1941, and Concepcion in 1942, 1951 & 1955.
218		w/n 4962	Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.

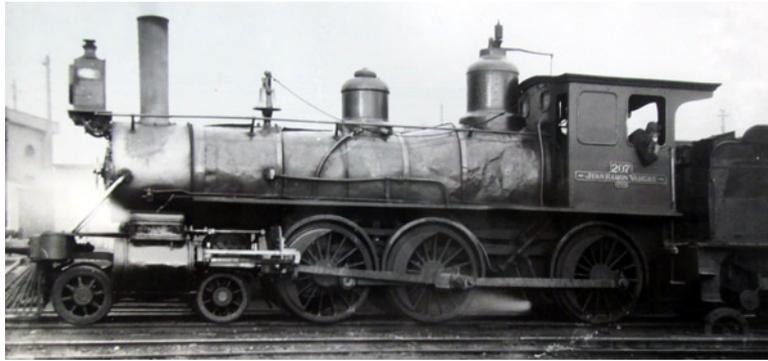
24 locos in class, **207-218, 223-234**, in 1902 [19], listed as ‘*de carga, pesados*’. 46 locos shown in post-1908 diagram book [24], on page 37, as nos. **207-218, 223-234, 247-260** and **283-290**. 45 in class in 1921, all in the 3rd zone. 45 in active fleet around 1928 [36]. 43 locos in active fleet in 1942 [37]. 43 locos given as total in 1951 list, though only 40 numbers given. 38 locos in fleet in 1955, and in 1957 [49]. 22 locos in class still in fleet list in 1965, and 17 in 1968 [*EFE memorias anuales*].

These locos were modified during their lives, by the fitment of ‘bolt-on’ piston valve chests in the same way as other classes, requiring the steam pipes to be moved out to the sides of the smokebox, and by the replacement of the original boilers having firebox-mounted domes by later ones with the dome further forward.

During 1899, 1900 and 1902 a series of accidents befell the bridge over the Río Claro, just north of Talca. The original bridge was washed away, and then in succession two temporary replacement bridges suffered the same fate. On the second occasion, on 25th June 1900, one of these Rogers 4-6-0s ended up in the river, but was presumably salvaged in due course [*Railway & Locomotive Engineer*, Nov. 1902, p463].



A *tipo* 38 4-6-0 as illustrated in a Rogers catalog.



Tipo 38 no. **207 'JUAN RAMON VARGAS'** as seen by P. C. Dewhurst, possibly around the time of the First World War.



MCC's own photo, taken at Quinta Normal museum. Note the bolt-on piston valve chests, in place of the original slide valves. Note also that the dome is further forward than in the previous picture, implying that reboilerings were done with a modified boiler design.

Tipo 39

(1st & only batch)

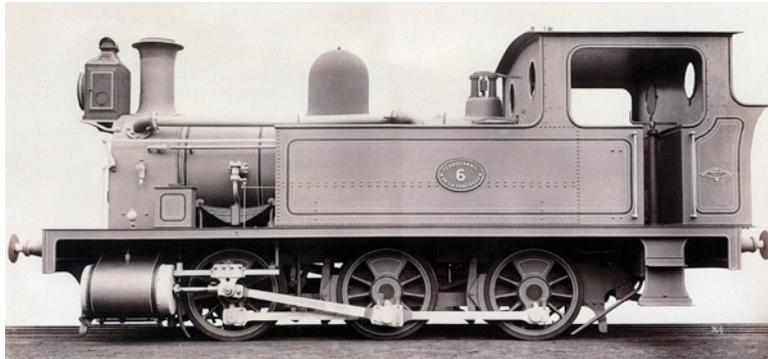
0-6-0T d/w 1067mm 42", cyls. 381x508mm 15"x20", built by Dübs in 1891

Ordered for *FC de Parcocha* in Spain but not all delivered. Four went to Spain but three were sold to Chile in 1894. Dübs order no. E2742. These have often been quoted as being Dübs nos. 2742, 2745 and 2746, however, nos. 2742, 2744 and 2745 apparently all survive at museums in Langreo, Asturias, Spain. Therefore it seems likely that somehow those that went to Spain and those which came to Chile have got mixed up. The batch of seven were Dübs nos. 2742-48. **This needs further work.**

219	w/n 2742?	Listed under <i>Zona I</i> (MByC) in 1939, 1941, 1942, 1951 & 1955. Survives at Balneario Cachapoal in Rancagua, though very derelict in 2019.
220	w/n 2745?	Listed under <i>Zona I</i> (MByC) in 1939, 1941, 1942, 1951 & 1955. Photos show that this loco at least, was modified latterly with an air pump on the left side of the smokebox, a standard sand-dome, sun visors over cabsides in which the original wide forward opening had been replaced by a small window, wider cab steps, the removal of the backward flare to the bunker, and the addition of of a front shunters'/switchers' step beneath the buffer beam in the usual American fashion.
221	w/n 2746	Listed under <i>Zona I</i> (MByC) in 1939, 1941, 1942, 1951 & 1955. Was

photographed working at Barón in the 1960s. Was in playground in Las Condes in 1987 [22].

3 locos in class, **219-221**, in 1902 [19], listed as '*maniobras*', d/w given as 50". Three locos listed in post-1908 diagram book [24]. 3 in class in 1921, all in the 1st zone. 3 in active fleet around 1928 [36]. 3 locos in active fleet in 1939, 1941, 1942 [37], 1951 and 1955, and in 1957 [49]. 3 locos still in fleet list in 1965 and 1968 [*EFE memorias anuales*]. Largely used in Valparaiso port.



Dübs builder's pic, of locos for Spain. The large pipe from the smokebox back to the tank suggests that these engines may have been built with condensing gear.



Not a very good photo, but one can see that in the picture of **221** at Barón in 1963, it has a spark-arresting stack, a sand dome, a side window in the cab and a bunker rear panel sloping from the buffer beam almost to the top.



No. **219** at the erstwhile Balneario Cachapual just south of Rancagua in April 2019.

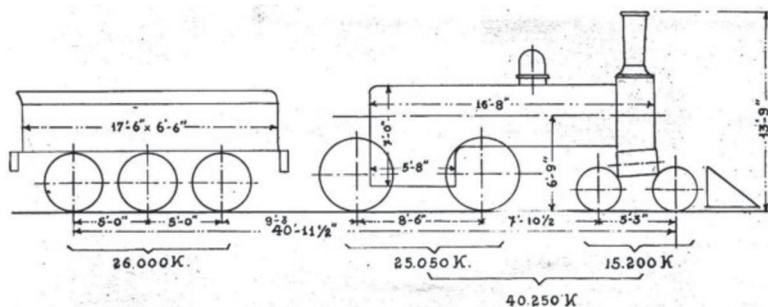
The chimney and the cab are noticeably different from the builders' photo.

Tipo 14

4-4-0 d/w 1676mm 66", cyls. 457x609mm 18" x24", built at the EFE's Valparaiso shops in 1896
222 'RECREO'

Confirmed by [1] and stated to be the same design as No. **67**. Loco with this number recorded as '*detenidas*' at San Bernardo (with-drawn?) during 1923 [3].

1 loco in class, **222**, in 1902 [19]. Listed in post-1908 diagram book [24] on page 28 (?) along with **67, 82, and 125**.



Sketch is from post-1908 *EFE* diagram book, in the SLS library file LD1896.

Tipo 38 (de carga, pesados)

(2nd batch +)

4-6-0 d/w 1422mm 56", cyls. 457x609mm 18" x24" built by Lever Murphy in 1894

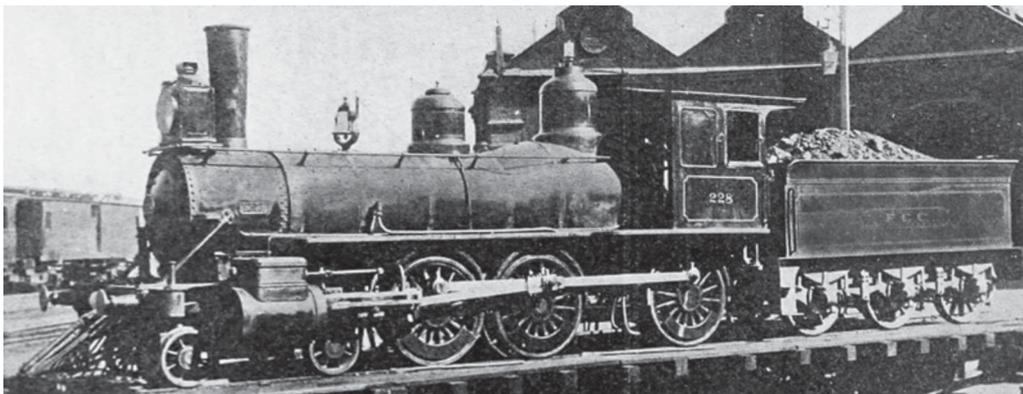
(One source says erected at the *EFE*'s own Santiago shops using parts made by Lever Murphy, but see notes). This order resulted from the same invitation to tender that was won by Brown Beeche & Co. on behalf of Rogers, see a page or two earlier. Lever Murphy, though quoting the slightly higher price of 41,000 Pesos each, were also awarded a contract as this would benefit national industry. Originally they were required to deliver 4 locos in 8 months, another 4 in 10 months, and the final 4 within 12 months, but this was extended by 3 months in each case. The reason was that the bid had been made with the assumption that the loco frames would be assembled abroad; if those too had to be made in Chile then additional time would be required. This plea was accepted as in any case the new engines would still be ready to help with the 1894 harvest.

NB Many, if not all, of these engines were later rebuilt with 'bolt-on' piston valve chests in the same way as locos of *tipos 57 and 58*.

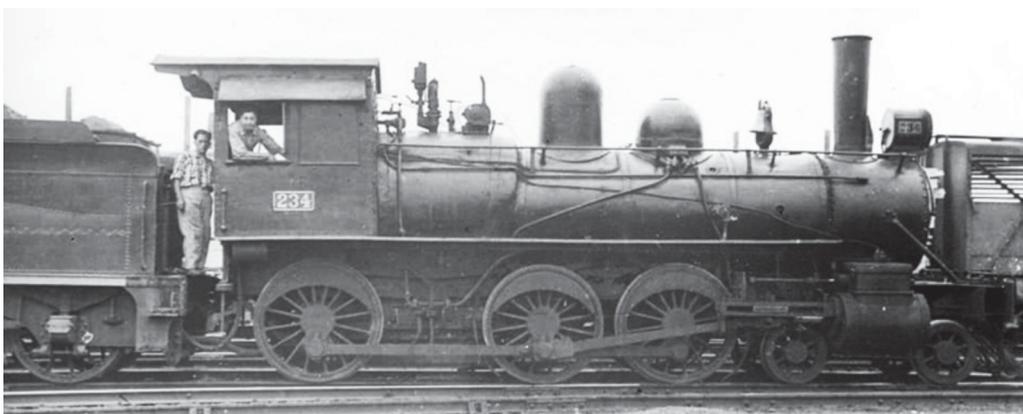
- 223** Strangely [1] says **223** built in Concepción shops in 1894, to the same design as nos. **224 et seq.** Listed under *Zona III (MC)* in 1939, 1941, 1942, 1951 & 1955.
- 224** [1] says this batch of 12 (sic) from **224** onward were built at Caleta Abarca in 1889, all up weight being 83975kg. Listed under *Zona III (MC)* in 1939, 1941, 1942, 1951 & 1955.
- 225** Listed under *Zona III (MC)* in 1939, 1941, 1942, 1951 & 1955.
- 226** Ran 70,490km in 1896. Listed under *Zona III (MC)* in 1939, 1941, 1942, 1951 & 1955.
- 227** Listed under *Zona III (MC)* in 1939, 1941, 1942, 1951 & 1955.
- 228** Listed under *Zona III (MC)* in 1939, 1941, 1942, 1951 & 1955.
- 229** Listed under *Zona III (MC)* in 1939, 1941, 1942, 1951 & 1955.
- 230** Listed under *Zona II (MSE)* in 1939, 1941, 1942, 1951 & 1955.
- 231** Air brake fitted 1896, when running in 1st section. Listed under *Zona III (MC)* in 1939, 1941, 1942, 1951 & 1955. Seen in steam at Angol in 1968 [35].
- 232** Air brake fitted 1896, when running in 1st section. Listed under *Zona II (MSE)* in 1939, 1941, 1942, 1951 & 1955.
- 233** Air brake fitted 1896, when running in 1st section. Listed under *Zona III (MC)* in 1939, 1941, 1942 & 1951.
- 234** Air brake fitted 1896, when running in 1st section. Listed under *Zona II (MSE)* in 1939, 1941, 1942, 1951 & 1955.

24 locos in class, **207-218, 223-234**, in 1902 [19], listed as '*de carga, pesados*'. 46 locos shown in post-1908 diagram

book [24], on page 37, as nos. **207-218, 223-234, 247-260** and **283-290**. 45 in active fleet around 1928 [36]. 43 locos in active fleet in 1941 & 1942 [37]. 43 locos given as total in 1951 list, though only 40 numbers given. 38 locos in fleet in 1955, and in 1957 [49]. 22 locos in class still in fleet list in 1965, and 17 in 1968 [*EFE memorias anuales*].



Whilst superficially similar to *tipo* 38 no. **207** seen in a photo a couple of pages back, this image of Lever Murphy-built no. **228** reveals slightly squatter domes and much more of a taper on the chimney.



No. **234** after reboiling, but still carrying side buffers and its original slide valves.

Trials with compounds

In the mid 1890s the *EFE*, following many other railways internationally, decided to investigate whether compounding offered any efficiency gains. Four pairs of 4-4-0s and 4-6-0s were ordered, two pairs of cross compounds from Rogers and the other two pairs using Baldwin's Vaucrain system of paired cylinders on either side. The usual conclusion was that the additional maintenance costs outweighed any fuel savings, and in any case the development of superheating soon provided an alternative method of improving efficiency. This seems to have happened in Chile too, and all eight locos were rebuilt in due course as simples.

Tipo 40

(1st & only batch)

4-4-0 d/w 1676mm 66", cyls. 317/553x609mm 12½"/21¾x24", Vaucrain compound built by Baldwin in 1895

Builder's photo suggests supplied with six-wheeled tenders. BLW class 08-19/36C nos. 1-2. Spec. is in vol. 20 p2.

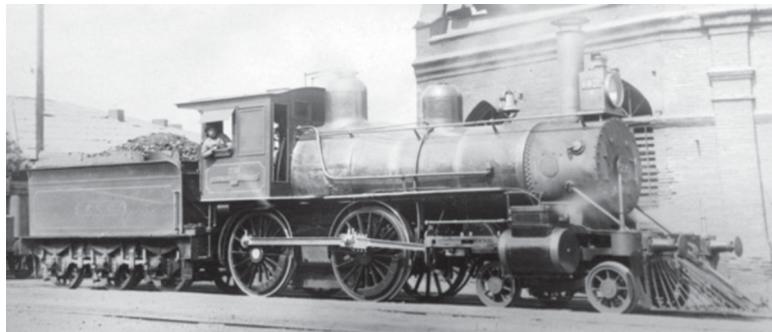
235 w/n 14369 Ran 75,754km in 1896. 'Excludas' in 1932 [3].

236 'name illegible' w/n 14370 Ran 73,673km in 1896.

2 locos in class, **235-236**, in 1902 [19]. Two locos shown in post-1908 diagram book [24] on page 38 (?). 1 in active fleet around 1928 [36]. None in active fleet by 1939/1942.



BLW archive pic; hi-res versions available from Railroad Museum of Pennsylvania



No. **236** after rebuilding as a simple. Photo is from the P. C. Dewhurst collection.

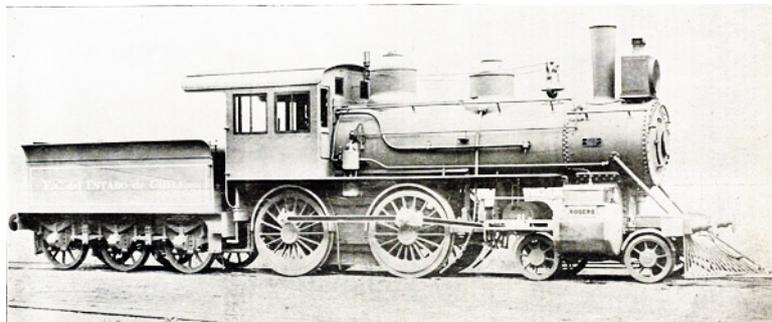
Tipo 41

(1st & only batch)

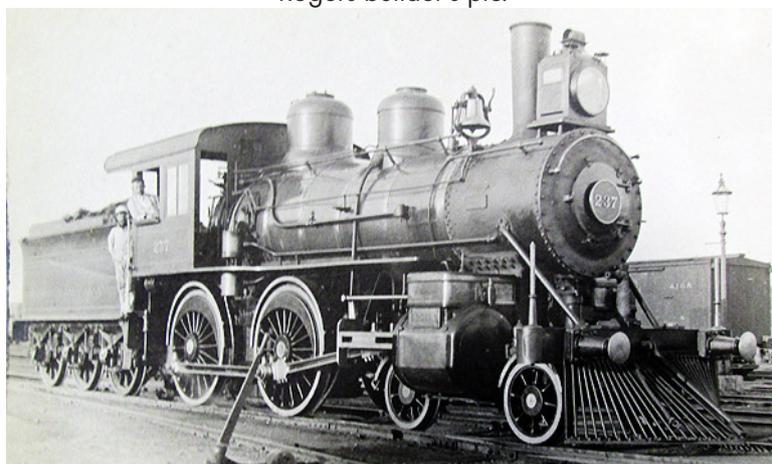
4-4-0 d/w 1676mm 66" , cyls. 483/724x609mm 19"/28"x24" cross compound built by Rogers in 1895

237 w/n 5041 Loco with this number engaged in electrification works train duties in 1931 [3]. Loco **237** leased to *Apostadero Naval de Talcahuano* 1932 [3].

238 w/n 5042 2 locos in class, **237-238**, in 1902 [19]. Two locos shown in post-1908 diagram book [24] on page 39 (?). 1 in active fleet around 1928 [36]. None in active fleet by 1939/1942.

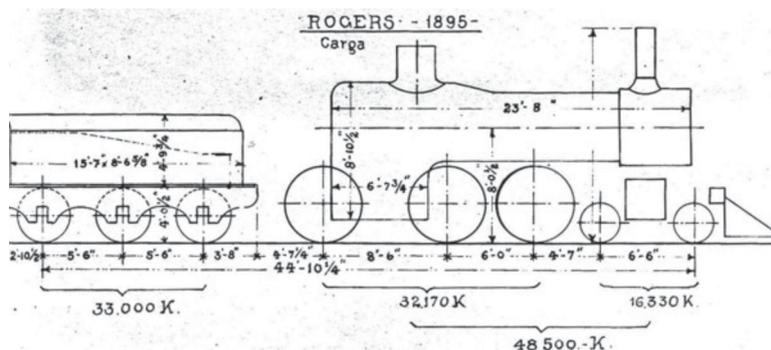


Rogers builder's pic.



No. **237** is seen in this image from P. C. Dewhurst's archive.

Nos. **235-242** were all rebuilt to 2-cylinder simple operation with cyls. 470x609mm, circa 1899.



Sketch is from post-1908 EFE diagram book, in the SLS library file LD1896.

Tipo 44

(2nd batch +)

4-4-0 d/w 1676mm 66", cyls. 445x609mm 17½" x24", built by Baldwin in 1895

Note that whilst these locos were classified as *tipo 44* along with those built earlier by Neilson, these engines had a different boiler from that earlier batch with the steam dome above the raised firebox. A note by Arturo Squire on a diagram sheet states that in later years a modified boiler was used which could fit both variants of the class. BLW class 08-30C no. 491-4. Spec. is in vol. 20 p35. Erecting card drawings 175-21X and 175-21AX are in the DeGolyer Library collection.

243	w/n 14468	Transferred to <i>DOP</i> in Feb 1932 [3].
244	w/n 14469	Loco with this number ' <i>excluidas</i> ' in 1930 [3]. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3].
245	w/n 14470	Loco with this number ' <i>excluidas</i> ' in 1930 [3]. Loco with this number sold to Braden Copper Co. in 1931 probably for scrap [3].
246	w/n 14471	Sold to Braden Copper Co. in 1929 [3], presumably for scrap.

4 locos in class, **243-246**, in 1902 [19]. Nine locos listed in post-1908 diagram book [24] on page 42 (?), as nos. **243-246, 181-184, and 120**, and with supposedly 18 more being constructed at that time. However, seven listed as in active fleet around 1928 [36]. None in active fleet by 1939/1942.

Tipo 38 (*de carga, pesados*)

(3rd batch +)

4-6-0 d/w 1422mm 56", cyls. 457x609mm 18" x24", built by Rogers in 1895

Rogers order J-1531 1-14 shipped Nov 1895. Rogers notes in PCD archive include special features as: steam chest valve Richardson. NB Many, if not all, of these engines were later rebuilt with 'bolt-on' piston valve chests in the same way as locos of *tipos 57* and *58*.

247	w/n 5085	Listed under <i>Zona II</i> (MSE) in 1939 & 1941, and under <i>Zona III</i> (MC) in 1942, 1951 & 1955.
248	w/n 5086	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. In steam at San Bernardo in 1978? Stored at MSB in 1981 [Bill Veloz] and 1984 [49]. Preserved in Santiago, at the Hotel Acacias de Vitacura.
249	w/n 5087	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
250	w/n 5088	Sold to Braden Copper Co. in 1929 [3] presumably for scrap. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955.
251	w/n 5089	Listed under <i>Zona II</i> (MSE) in 1939, and under <i>Zona III</i> (MC) in 1941, 1942, 1951 & 1955.
252	w/n 5092	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
253	w/n 5093	Listed under <i>Zona III</i> (MC) in 1939, 1941 & 1942. Dismantled 1948

		[1951 <i>EFE</i> blue-print loco list].
254	w/n 5094	Withdrawn 1920? To be withdrawn in 1921 [<i>EFE memoria</i> 1920 p323]
255	w/n 5095	Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
256	w/n 5096	This loco ran highest mileage (93,916km) of any in <i>Zona</i> 4 during 1907 [41]. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
257	w/n 5097	Listed under <i>Zona</i> II (MSE) in 1939, 1941 & 1942. Dismantled 1949 [1951 <i>EFE</i> blue-print loco list].
258	w/n 5098	Transferred to <i>DOP</i> in Feb 1932 [3]. Not in <i>EFE</i> lists for 1939, 1941, 1942, or 1951.
259	w/n 5099	Loco with this number engaged in electrification works train duties in 1923 [3]. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
260	w/n 5100	Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.

14 locos in class, **207-218, 223-234**, in 1902 [19], listed as '*de carga, pesados*'. 46 locos shown in post-1908 diagram book [24], as nos. **207-218, 223-234, 247-260** and **283-290**. 45 in active fleet around 1928 [36]. 43 in active fleet in 1942 [37]. 43 locos given as total in 1951 list, though only 40 numbers listed. 38 locos in fleet in 1955, and in 1957 [49]. 22 locos in class still in fleet list in 1965, and 17 in 1968 [*EFE memorias anuales*].

Tipo 15

4-4-0 d/w 1676mm 66", 381x609mm 15"x24", built by Baldwin in 1889

Ordered for the North & South American Construction Co. Taken over by the *DOP* on the expropriation of Señor Julio Bernstein's ex-N&SACCo. assets, and from thence to the *EFE*, presumably after the arrival of the locos above if the running numbers of the batch are a clue. They were known sometimes as the 'Peñaflor' class, after the town outside Santiago, and because that was the name of one member of the class. There seems to have been some renumbering of these locos during the first years of the 20th century. Those on the isolated Valdivia to Osorno railway are recorded with a variety of numbers but with their names remaining the same, ie. not a swop of names. Also, in 1903 one of them was identified as '**LUELLA**' **263** which had previously been hired to Snr. Nicolai. There seem to have been six to eight of them on the Valdivia to Osorno contracts but numbers **256, 259, 260, 262, 263, 264, 265, 268, 271, 272, 273**, and **274** were all mentioned there at one time or another. Loco named '**UNION**' arrived by barge at Trumao on the Rio Bueno in mid-1893 for use by a Valdivia to Osorno contractor. Also a **263** '**LONCOCHE**' was on hire around 1902-5 to Eugene Bobillier. See the *DOP* section (1.3.1) for more detail.

261 'LAUTARO'	w/n 10002	
262 'PEÑAFLO'	w/n 10003	Photo confirms this loco bore name ' PEÑAFLO' [8].
263 'VALDIVIA'	w/n 10006	Withdrawn 1921? To be withdrawn in 1921 [<i>EFE memoria</i> 1920 p323]
264 'TALAGANTE'	w/n 10007	Reconstructed at Valdivia shops in 1910 [1]. Loco with this number recorded as ' <i>detenidas</i> ' at MSB (withdrawn?) during 1923 [3].
265 'MELIPILLA'	w/n 10008	Loco with this number recorded as ' <i>detenidas</i> ' at MSB (withdrawn?) during 1923 [3].
266 '?'	w/n 10009	Sold to Braden Copper Co. in 1929 [3] presumably for scrap. Withdrawn 1932?
267¹ '?'	w/n 10010	
268¹ 'ANTILHUE'	w/n 10011	

Numbers 267-8 were reused in 1914 for locally built tipo 57 locos, see below.

269 'MALLOCO'	w/n 10013	General repair at Valdivia shops in 1910 [1]. Loco with this number recorded as ' <i>detenidas</i> ' at MSB (withdrawn?) during 1923 [3].
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270 ‘?’	w/n 10017	
271 ‘?’	w/n 10020	Named ‘ VALDIVIA ’, at Valdivia in 1901, but sometimes numbered 264 or 270 [4]. Withdrawn 1918?
272 ‘SAN JOSÉ’	w/n 10021	
273 ‘OSORNO’	w/n 10022	
274 ‘SAN VICENTE’	w/n 10023	later renamed ‘ LA UNIÓN ’ [4]. Withdrawn 1916?

List in 1896 diagram book [24] includes **68-70, 100-105, 261-274** and **492**. 14 locos in fleet, **261-274**, in 1902 [19], of which nos. **262** and **267-274** were at that time working on lines under construction. 11 still in fleet around 1928 [36], 1 active, 9 listed as ‘obsolete or knocked-down’, and 1 as ‘rented or loaned’.

Tipo 44 (3rd & last batch)
4-4-0 d/w 1676mm 66", cyls. 445x609mm 17½"x24", an additional loco built by the EFE’s own Santiago workshops in 1900

Source [1] says with a 4 axle tender and a weight of 75600kg.

120 ‘RANCAGUA’	Loco with this no. recorded as ‘ <i>detenidas</i> ’ at San Bernardo (with-drawn?) during 1923 [3]. A loco 120 was transferred back from <i>DOP</i> in 1930 [3] in part payment for loco 335 sold to the <i>DOP</i> . Loco with this number 120 ‘ <i>excluidas</i> ’ in 1930 [3]. Loco with this number 120 sold to Braden Copper Co. in 1931 presumably for scrap [3].
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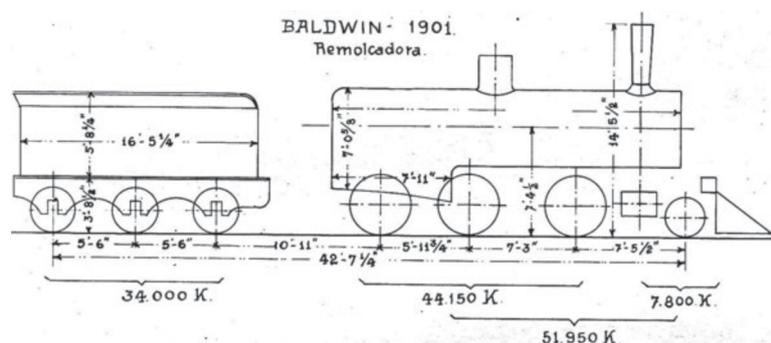
1 loco in class, **120**, in 1902 [19]. Nine locos listed in post-1908 diagram book [24], as nos. **243-246, 181-184**, and **120**, and with supposedly 18 more being constructed at that time. However, seven listed as in active fleet around 1928 [36].

Tipo 45 (remolcadora, gradiente excepcional) (1st & only batch)
2-6-0 d/w 1245mm 50", cyls. 457x609mm 18"x24", built by Rogers in 1900

This was the pair of broad gauge moguls tagged on to the second metre gauge *tipo R* order. Purchase price £3,160 Sterling each. A note by Arturo Squire on a diagram sheet states that the axle loading was heavier than shown in the diagram, being over 16 long tons on each driven axle. He suggests that the weights shown in the diagram were merely to avoid alarming the civil engineers!

275 ‘DIEGO HALL’	w/n 5653	Loco with this number recorded as ‘ <i>detenidas</i> ’ at San Bernardo (with-drawn?) during 1923 [3]. Sold to Braden Copper Co. in 1929 [3], presumably for scrap.
276 ‘C. HILLMAN’	w/n 5654	A loco 276 loaned/leased to <i>DOP</i> in 1920, location unknown [3]. On hire to <i>DOP</i> in 1920 [<i>EFE memoria</i> 1920 p323]. Sold to Braden Copper Co. in 1929 [3], presumably for scrap.

2 locos in class, **275-276**, in 1902 [19], listed as ‘*gradiente excepcional*’. Two listed in post-1908 *EFE* diagram book [24]. 2 in fleet around 1928 [36] but listed as ‘obsolete or knocked-down’.

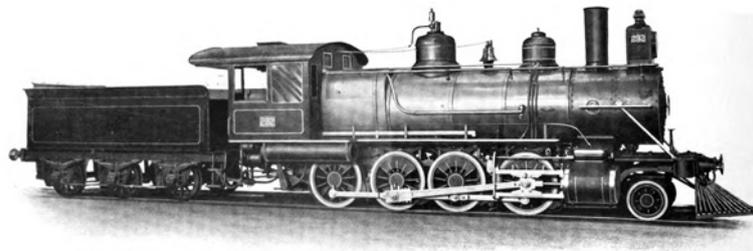


Tipo 46 (Baldwin – remolcadora) (1st & only batch)
2-8-0 d/w 1270mm 50", cyls. 508x509mm 20"x24", built by Baldwin in 1901

Into service May-June 02 [9] for El Tabón section. Supplied via Beeche i Cía. Source 13 says d/w 60". Builder's photo suggests supplied with six-wheeled tenders. Purchase price \$(Chilean Pesos) 51,333 each. BLW class 10-34E nos. 1617-1622. Spec. is in vol. 24 p128. Erecting card drawing 471A-96 is in the DeGolyer Library collection. Attached to the spec. is a note reading: "Great exception has been taken to the channel tenderframe with the pedestals bolted to the outside channel iron. They would have been rejected but for the clause in the specification that Mr. Moraga published, specifying channel iron frame. What they really require is tender like those built in 1895 with six wheels and plate frames.

- | | | |
|------------|-----------|--|
| 277 | w/n 19942 | Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955. |
| 278 | w/n 19943 | Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
A photo shows this loco with a replacement taller dome and without the usual Baldwin enlarged base, and with a standard <i>EFE</i> sanddome much further back in place of the original Baldwin one. |
| 279 | w/n 19944 | Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
However, dismantled 1950 [according to 1951 <i>EFE</i> blue-print loco list]. |
| 280 | w/n 19945 | Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955. |
| 281 | w/n 19946 | Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955. |
| 282 | w/n 19947 | Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955. |

6 locos in class, **277-282**, in 1902 [19], listed as 'gradiente excepcional'. Six listed in post-1908 *EFE* diagram book [24]. 6 in class in 1921, all in *Zona* I (MByC). 6 in active fleet around 1930 [36]. 6 locos in active fleet in 1941, 1942 [37], 1951 & 1955 despite what blue-print list says for no. **279** above. 5 surviving in 1957 [49]. 4 locos in class still in fleet list in 1965, and 1 in 1968 [*EFE memorias anuales*].



Tipo 29
0-6-2T d/w 1118mm 44", cyls. 381x609mm 15"x24", built by Baldwin in 1902

These locos were diverted on delivery to the *DOP* where they became nos. **117-9** officially but may have retained their *EFE* number-plates. There was a complaint that they arrived with no spares. BLW class 08-24 1/3D nos. 16-18. Spec. is in vol. 24 p243. Erecting card drawing 466A-90 is in the DeGolyer Library collection.

- | | | |
|------------------------|-----------|---|
| 283¹ | w/n 20211 | A single loco of this type, interestingly identified by its <i>DOP</i> number 117 , was listed in the post 1909 diagram book [24]. |
| 284¹ | w/n 20212 | Transferred back provisionally to the <i>EFE</i> in 1911 [2], having gained a name 'CULLINCO' during its time working on Puá to Curacautín branch construction. |
| 285¹ | w/n 20213 | |

The numbers 283-285 were reused almost immediately for tipo 38 4-6-0s. See directly below. Strangely one loco still seems to have been classified as tipo 29 around 1928 [36] though listed as 'obsolete or knocked-down'. Two seem to have returned permanently to the *EFE* eventually, see below in 1910, but were then allocated tipo 68 and numbered

644-5. This may fit with [16] implying that two of them may have gone to Coquimbo for a while. Certainly AS, see appendix, wrote in 1928 that these three locos were numbered at the time as **117, 644** and **645**.

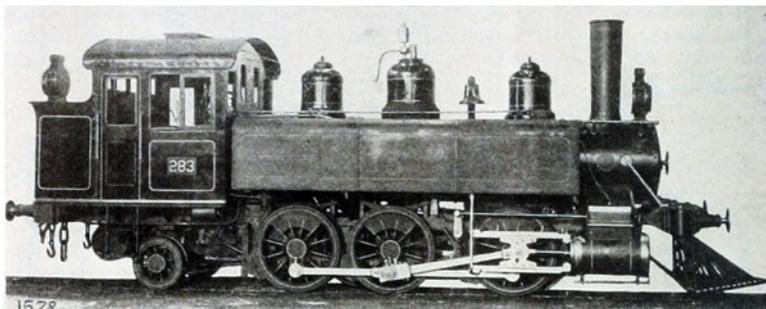


Image published in *Railway & Locomotive Engineering* in 1902; higher-res versions are available from the Railroad Museum of Pennsylvania

Tipo 38

(4th & last batch)

4-6-0 d/w 1422mm 56" were normal for tipo 38, but one source suggests that this batch had d/w 1245mm 49". This needs checking. Cyls. 457x609mm 18" x24", built by Cooke in 1902.

Cooke order no. C-208 1-7[?8?], shipped in Feb. 1902. Supplied via W. R. Grace i Cía. Whole batch into service June-July 02 [9]. Arturo Squire suggests that this batch may have had Belpaire fireboxes. NB Many, if not all, of these engines were later rebuilt with ‘bolt-on’ piston valve chests in the same way as locos of *tipos* 57 and 58.

283²	w/n 2748	Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942 & 1951.
284²	w/n 2749	Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Valdivia in 1972. Seen at Temuco in 1972 [Ron Ziel], and at MSB in 1974 [10].
285²	w/n 2750	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
286	w/n 2751	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
287	w/n 2752	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955. Photographed in steam at Rancagua in 1940s. Seen at Concepcion in late 1969 [Ken Mills].
288	w/n 2753	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
289	w/n 2754	Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
290	w/n 2755	This was the last loco built by Cooke before the merger into ALCo. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.

8 locos in class, **283-290**, in 1902 [19], listed as ‘*de carga, pesados*’, with d/w given as 56". 46 locos shown in post-1908 diagram book [24], on page 37, as nos. **207-218, 223-234, 247-260** and **283-290**. 45 in active fleet around 1928 [36]. 43 in active fleet in 1941 & 1942 [37]. 38 locos in fleet in 1955, and in 1957 [49]. 22 locos in class still in fleet list in 1965, and 17 in 1968 [*EFE memorias anuales*].



When compared to the photos of earlier *tipo* 38 locos, this picture of Cooke-built no. **286** has a more rounded dome mounted in front of the firebox rather than over it, and a very distinctive rectangular smokebox door. How much of this results from modifications in service is as yet unknown.

'Baldwin – remolcadora', for FC de Coquimbo, later joined Red Sur in 1916, see below 2-8-0 d/w 1220mm 48", cyls. 457x609mm 18" x24", built by Baldwin in 1902

Supplied via Beeche i Cía. Into service June 1902 [9] for the steeply-graded Las Cardas section of the Coquimbo railway. The 1919 list of loco purchases for the preceding couple of decades implies that these locos were ordered specifically for use in the north, rather than a move north being an after-thought. However, an annotation to a diagram sheet found in the Dewhurst collection says used between Santiago and Talca before being sent north, and 1905, 1906 and 1907 Coquimbo loco lists do not include these engines. The return from Coquimbo in 1916 makes sense as that was when the broad gauge there ceased to operate. Builders' photo available at Penn. RR Museum (no. 01540). The high resolution image clearly shows the works-plate on the smokebox. This looks very much as though it carries the number 19955 rather than 19956. I wonder if these two numbers were muddled in some way, for 19955 was a 2-8-0 for Mexico.

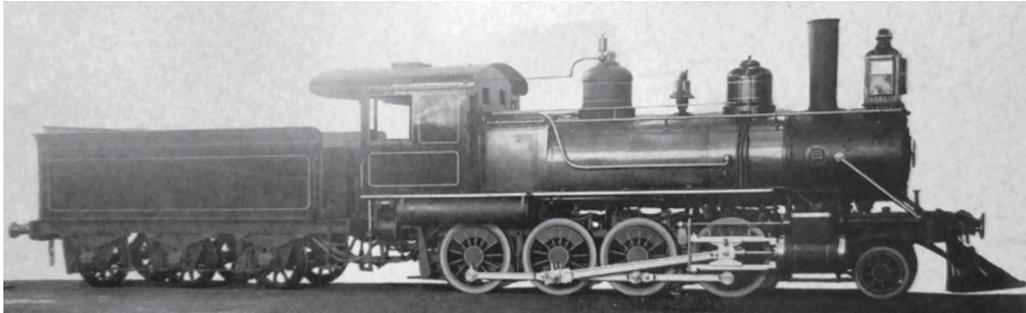
291¹ w/n 19956

292¹ w/n 19957

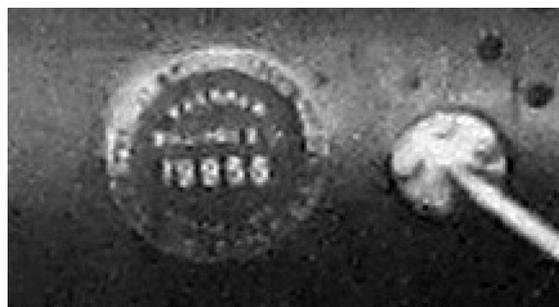
Two listed in post-1908 *EFE* diagram book [24], as being in Coquimbo from 1909. 2 locos in class, **291-292**, in 1902 [19], listed as *'gradiente excepcional'*.

[16] says these were shipped south in 1916 when the Coquimbo broad gauge closed, but then became *tipo* 69 nos.

646-7. It rather looks as though they had been purchased when all locos were being numbered in a single sequence, but having gone to Coquimbo they had then been forgotten about by the main broad gauge network (and their numbers reused), and thus had to receive new numbers when they came south in 1916.



The original low-mounted boiler seen here can be compared with the later appearance as shown in a photo shown later showing one of these locos after its return from Coquimbo, see *tipo* 69 no. **647**.



The worksplate seemingly showing 19955 rather than 19956.

The fleet in 1902

Interestingly, a fleet list from October 1902 shows that every single number from **1** to **292** was in use on the broad gauge at that point. These were distributed in the following categories:

<i>Expresos</i>	9
<i>Ordinarios ligeros</i>	67
<i>Ordinarios lentos</i>	12
<i>De carga, livianos</i>	48
<i>De carga, pesados</i>	107
<i>Gradiente excepcional</i>	13
<i>Maniobras</i>	34
<i>Servicios especiales</i>	2

Numbers 291-301 reused in 1909-10 for new tipo 20 locos. See below.

293-295 unknown at this date.

296-315 first allotted to metre gauge stock in 1902

Numbers 292-301 were then used in 1909, and numbers 302-15 in 1911, for new tipo 20 locos. See below.

0-6-0 (though one source said 4-4-0) d/w ?, cyls. ?x?, built in EFE's Santiago workshops in 1903

"It was built without any drawings by the mechanic Alfred Dwnet, who drew the motion and rods full size on a sheet of floor boarding. The wheels and cylinders were spares – the wheelbase 16 3 ft.", as stated by Arturo Squire in 1925. [53] "Using wheels and axles from a loco built in 1856" according to [1], and stated there to have had 3 axles coupled, and a 4 axle tender and to be for goods use. However, photo below seems to show a rigid wheelbase tender (ie. 3 axles) rather than a bogie tender.

316 'JORGE BRUNTON'

George Brunton was an *EFE* loco engineer, and is mentioned in Arturo Squire's notes (See appendix). However, no detail about his origins or career have surfaced.

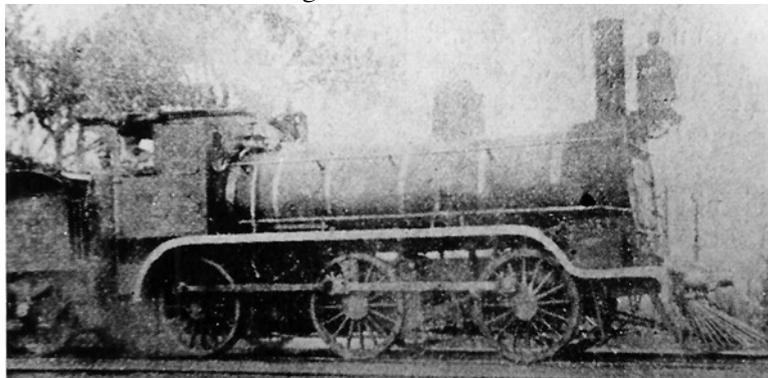


Photo courtesy of Pablo Moraga.

Tipo 47

(1st batch +)

0-6-0 d/w 1480mm 58¼", cyls. 450x660mm 17¾"x26", built by Borsig in 1905

317-325 ordered by decree 1226 of 4-7-1904, **326-329** ordered by decree 1282 of 14-7-1904, all via *M. Gleisner i Cía.* Part of the 30 loco contract.

317 'E. VALDÉS LECAROS' w/n 5514

Into service April-May 05 [9] – applies to following batch of 9. Allocated to *Zona II* (MSE) in 1910. All these 1910 allocations found in the *Dirección Jeneral de Ferrocarriles memoria* for that year. Listed under *Zona III* (MC) in 1939, 1942, 1951 & 1955.

318 'R. BASCÚNAN S'

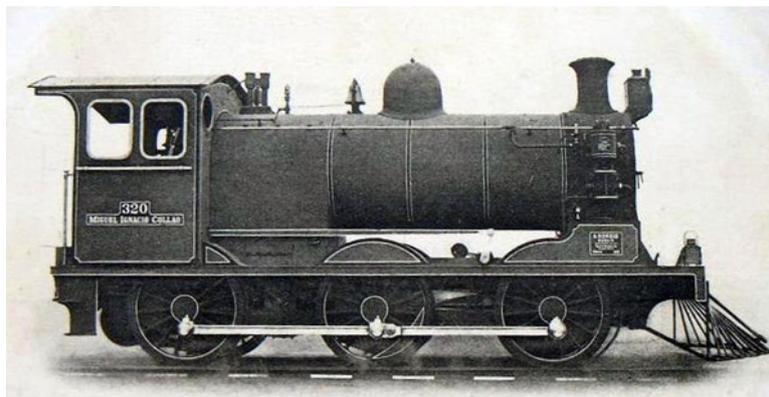
w/n 5515

Allocated to *Zona I* (MByC) in 1910. Listed under *Zona I* (MCalera) in 1939, 1942 & 1951, but another list says under *Zona III* (MC) in 1951. Certainly under *Zona III* (MC) in 1955. Photographed somewhere on Arauco coast in 1973.

319 'I. M. INFANTE'	w/n 5516	Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, and under <i>Zona I</i> (MCalera) in 1942, but back under <i>Zona III</i> (MC) in 1951, and 1955.
320 'MIGUEL IGNACIO COLLAO'	w/n 5517	Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1942, 1951 & 1955.
321 'A. EDWARDS'	w/n 5518	Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1942, 1951 & 1955.
322 'JUAN E. CLARK'	w/n 5519	Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona I</i> (MBarón) in 1939, 1942, 1951 and 1955.
323 'C. BORDALLI+'	w/n 5520	Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1942, 1951 & 1955. Seen at Osorno Ovejería shed in 1968 [DTR].
324 'R. AGUILERA+'	w/n 5521	Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1942, 1951 & 1955.
325 'TOMÁS MAY+'	w/n 5522	Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1942, 1951 & 1955.
326 'S. VILLALOBOS+'	w/n 5538	Into service June-July 05 [9] – applies to following batch of 4. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1942, 1951 & 1955.
327 'C. SCHANKE+'	w/n 5539	Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1942, 1951 & 1955.
328 'S. SEGOVIA+'	w/n 5540	Allocated to <i>Zona II</i> (MSE) in 1910. Withdrawn 1919?
329 'H. GODOY+'	w/n 5541	Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1942, 1951 & 1955.

+ Locomotives named after railwaymen killed on duty each carried a black Maltese Cross after the name.

77 locos listed in post-1908 *EFE* diagram book [24] page 59, **317-329, 342-349, 361-382, 388-421**. In 1918 it was reported that these locos were to change from oil to grease lubrication (of their axleboxes presumably and maybe their rod ends) and that this would save a considerable sum [42, year 1918 p1044]. 72 in active fleet around 1928 [36]. 71 in active fleet in 1942 [37]. 67 in fleet in 1955, and in 1957 [49]. 37 locos in class still in fleet list in 1965, and 36 in 1968 [*EFE memorias anuales*]. 1969 instruction to withdraw all members of class becoming due for heavy repair [49]. Only 1 left by 1979 [49].



Borsig publicity card pic. In later years the sandboxes incorporated into the front wheel splashers were replaced by the usual sand-dome, and the Westinghouse pumps were moved to the left side.

Tipo 48

(1st batch +)

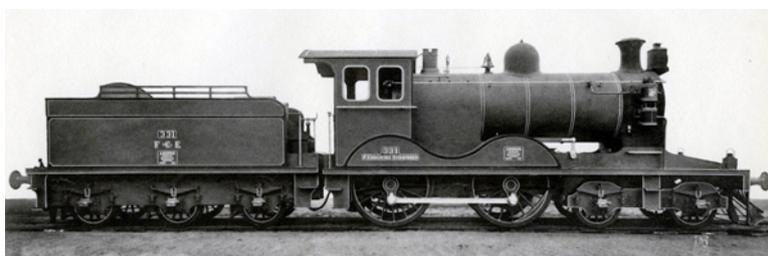
4-4-0 d/w 1785mm 70¼", cyls. 450x660mm 17¾"x26", built by Borsig in 1905

Ordered by decree 1282 of 14-7-1904, all via *M. Gleisner i Cía*. Batch of four into service May-June 05 [9]. Inside

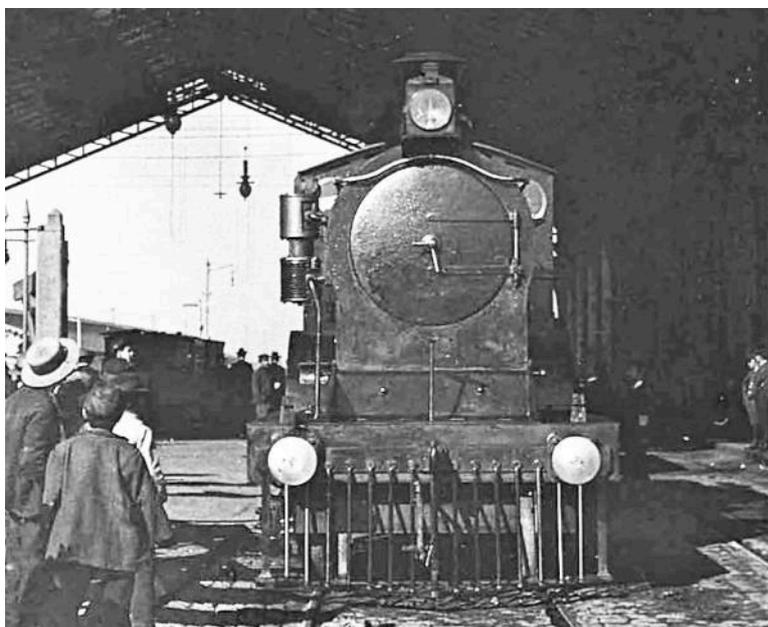
cylinders. Part of the 30 loco contract.

- 330 'J. RIESCO'** w/n 5562 Allocated to *Zona I* (MByC) in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951.
- 331 'F. ERRÁZURIZ ECHAUREN'** w/n 5563 Boiler seriously damaged soon after arrival by being lit up when empty of water [MOBR1802]. Allocated to *Zona I* (MByC) in 1910. [8] includes builders' pic showing number and name. Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951.
- 332 'A. ZAÑARTU'** w/n 5564 Allocated to *Zona I* (MByC) in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951.
- 333 'ELÍAS FERNÁNDEZ ALBANO'** w/n 5565 Allocated to *Zona I* (MByC) in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951. This loco at least was modified to have only minimal splashers and no level running plates, giving it a very distinctive appearance.

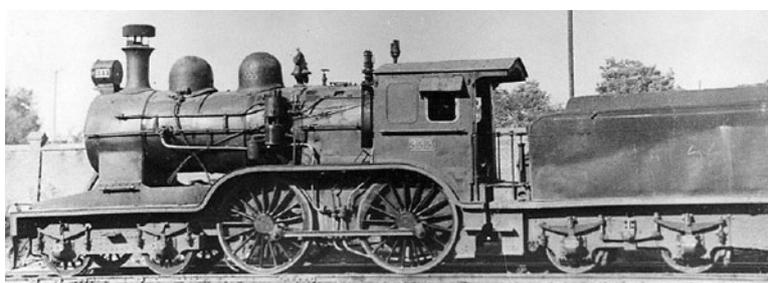
Thirteen, **330-333** and **352-360**, listed in post-1908 diagram book [24] on page 47 (?). 4 in class in 1921, all in the 2nd zone. 13 in active fleet around 1928 [36]. 13 in active fleet in 1941 & 1942 [37]. 12 in active fleet in 1951. 2 surviving in fleet in 1957 but none in 1968 [49].



Borsig publicity card pic



A tipo 48 loco stands at the Estación Central before crossing the Alameda to proceed north up Avenida Matucana.



No. **333**, as strikingly modified, and with a standard *EFE* sand-dome.

Tipo 49 (Pasajeros i expresos)

(1st & only batch)

4-4-0 d/w 1785mm 70¼", cyls. 450x660mm 17¾" x26", built by Balfour Lyon in 1905-6

Ordered by decree of 27-8-1904. Batch of four into service June 06 to Jan 07 [9]. This batch had 3 axle tenders and weight of 78770kg according to [1]. US style cylinders, prominent bracing bars from short smokebox to buffer-beam. Boiler lagging much fatter than smokebox, and tall thin dome. Smokebox door appears to be British style rather than US. Cab roof has a reverse curve.

334 ‘R. SOTOMAYOR’

Allocated to *Zona II* (MSE) in 1910. Loco with this number ‘excluídas’ in 1930[3]. Loco with this number sold to Braden Copper Co. in 1931 presumably for scrap [3].

335 ‘J. LAZCANO’

Allocated to *Zona II* (MSE) in 1910. Transferred/sold to *DOP* in 1929/30 and then used on Loncoche to Villarica [2] [3].

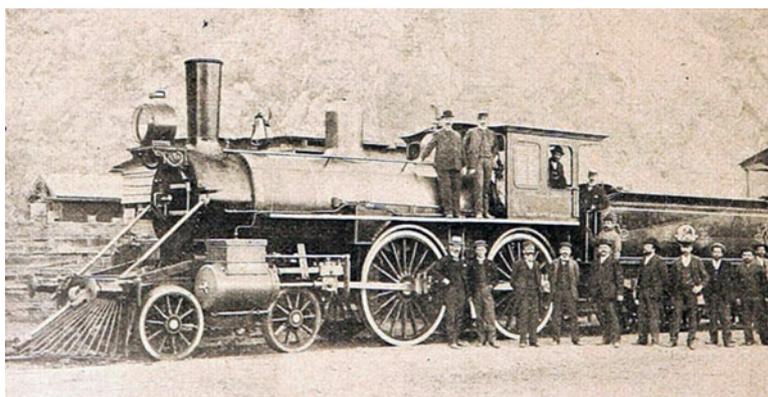
336 ‘F. VALDÉZ L.’

Allocated to *Zona II* (MSE) in 1910. Loco with this number ‘excluídas’ in 1930[3]. Loco with this number sold to Braden Copper Co. in 1931 presumably for scrap [3].

337 ‘D. PORTALES’

Allocated to *Zona II* (MSE) in 1910. Loco with this number ‘excluídas’ in 1930[3]. Loco with this number sold to Braden Copper Co. in 1931 presumably for scrap [3].

Four listed in post-1908 *EFE* diagram book [24] page 54. Four in active fleet around 1928 [36]. All withdrawn from active *EFE* fleet around 1929-30, see notes for individual locos.



Twin chimney ‘draft equalizer’

A photo taken in a round-house “at Santiago”, presumably at San Eugenio, and published in the *Railway Magazine* in February 1908, shows three locomotives each with double chimneys arranged transversely. Two of the engines would appear to be *Tipo 44* 4-4-0s, whilst that on the left may well be one of the ex *FCSV* 4-6-0s from the El Tabón incline. Arturo Squire recorded “This was an idea of Oscar Huber, Rogers’ man, to improve draft. The smokebox was divided vertically and two exhaust nozzles used. Did not result. I later redistributed the tubes in the bad steamers, suppressing about 6 to 8 tubes and spacing ¾" instead of ⅝" base, and leaving more space between tubes and boiler side, and got all the steam required and more.” [53].

These chimneys look very much like those tried out on the Toledo, Peoria & Western Railroad in the USA around the mid-’90s, the purpose being to even out the draft through the tubes and thus to improve coal consumption. This invention was patented by W. B. Warren, the General Foreman of the T. P. & W. R. R. Warren claimed that this arrangement gave greater draft on the sides of the boiler, producing a greater amount of steam with larger exhaust nozzles, thus reducing back pressure; greater speed with less weight of motive power; 40% larger area of smokestack openings; 20% larger area of exhaust nozzle opening; a saving in fuel; and greater steaming capacities with small boilers [*Railway & Locomotive Engineering*, Jan. 1898, p19].

The number of Chilean locos so fitted is unknown, as is the length of the trial. The external chimney tubes were sepa-

rate, but the exhausts from each of the two cylinders were combined before re-dividing into the two separate blast-pipes.

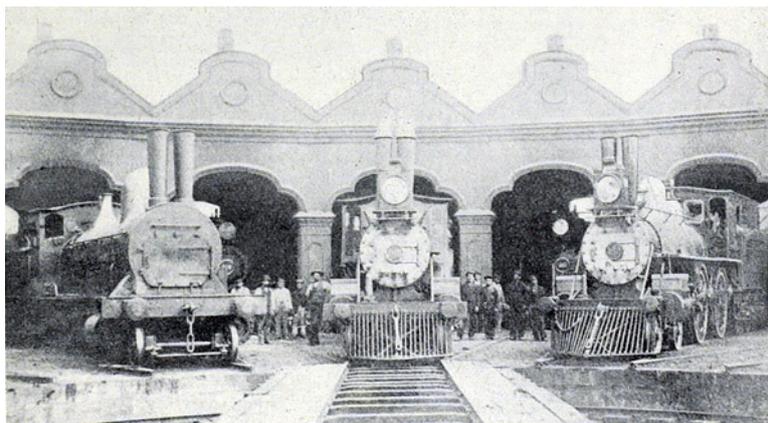
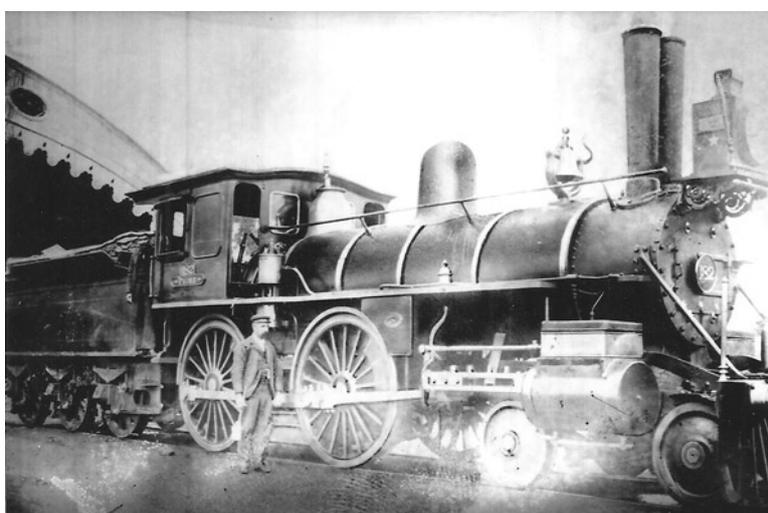


Image from *Railway Magazine*, February 1908.



Tipo 44 no. **182 'PAINE'** with twin chimneys. Photo courtesy of Señor Pablo Moraga, but also published in *Railway & Locomotive Engineering*.

338-341 were allocated initially for metre gauge locos. They were then used in 1912 for new tipo 20 locos. See below.

(340 'RODULFO A. PHILIPPI' w/n 5566 Jens Merte's Borsig list suggests these two were broad gauge 2-6-0s,
341 w/n 5567 but this is a mistake. As metre gauge locos, they will have been numbered **340-1** but then rapidly renumbered, releasing these numbers for re-use.)

Tipo 47

(2nd batch +)

0-6-0 d/w 1480mm 58¼", cyls. 450x660mm 17¾" x26", built by Borsig in 1905

Part of the 30 loco contract, ordered by decree 458 of 7-4-1905, via *M. Gleisner i Cía.*

- | | | |
|----------------------------|----------|---|
| 342 'E. KÖRNER' | w/n 5657 | Into service Dec. 05-May 06 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1942, 1951 & 1955. |
| 343 'I. SOTOMAYOR' | w/n 5658 | Into service Dec. 05-May 06 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1942, 1951 & 1955. |
| 344 'E. VILLEGAS' | w/n 5659 | Into service Dec. 05-May 06 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1942, 1951 & 1955. |
| 345 'A. McPHERSON+' | w/n 5660 | Into service Dec. 05-May 06 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1942, 1951 & 1955. |
| 346 'A. MARTINEZ+' | w/n 5661 | Into service Dec. 05-May 06 [9]. Repaired by Balfour Lyon in 1909 |

at a cost of \$15,000 [*El Mercurio* 1st Sept. 1909]. Allocated to *Zona I* (MByC) in 1910. Listed under *Zona II* (MSE) in 1939 & 1942.

Dismantled 1950 [1951 *EFE* blue-print loco list].

347 'JULIO BAÑADOS ESPINOZA+' w/n 5662 Into service Dec. 05-May 06 [9]. Allocated to *Zona I* (MByC) in 1910.

348 'I. M. OSORIO+' w/n 5663 Into service Dec. 05-May 06 [9]. Repaired by Balfour Lyon in 1909 [MOBR2209] including firebox repair or replacement. Allocated to *Zona I* (MByC) in 1910. Listed under *Zona I* (MByC) in 1939, 1942, 1951 & 1955.

349 'I. M. AHUMADA+' w/n5664 Into service Dec. 05-May 06 [9]. Allocated to *Zona II* (MSE) in 1910. Listed under *Zona I* (MByC) in 1939, 1942, 1951 & 1955.

77 locos listed in post-1908 *EFE* diagram book [24] page 59, **317-329, 342-349, 361-382, 388-421**. In 1918 it was reported that these locos were to change from oil to grease lubrication (of their axleboxes presumably and maybe their rod ends) and that this would save a considerable sum [42, year 1918 p1044]. 72 in active fleet around 1928 [36]. 71 in active fleet in 1942 [37]. 67 in fleet in 1955, and in 1957 [49]. 37 locos in class still in fleet list in 1965, and 36 in 1968 [*EFE memorias anuales*]. 1969 instruction to withdraw all members of class becoming due for heavy repair [49]. Only 1 left by 1979 [49].

Tipo 50 (Maniobras)

(1st & only batch)

2-6-0T d/w 1100mm 43¹/₄" , cyls. 360x480mm 14¹/₄"x18³/₄" , built by Borsig in 1905

Ordered by decree 687 of 22-3-1905. Shunting locos, into service Feb 1906 for *FC de Circunvalacion* around Santiago [9]. Part of the 30 loco contract. Source [39] says many parts were identical to the metre gauge *tipo K 2-6-2Ts*.

350 'THOMAS BLACKWELL+' w/n 5665 Loco with this number recorded as '*detenidas*' at MSB (withdrawn?) during 1923 [3]. Loco with this number '*excluidas*' in 1930 [3]. Loco with this number sold to Braden Copper Co. presumably for scrap in 1931 [3].

351 'EUSEBIO LILLO+' w/n 5666 Loco with this number recorded as '*detenidas*' at MSB (withdrawn?) during 1923 [3]. Survived in Valparaiso, possibly in private ownership as a shunter, and was later plinthed in the Plaza Waddington, but seems to have been cut up by metal thieves around 2006.

Two listed in post-1908 *EFE* diagram book [24] page 53 (?). 1 in fleet around 1928 [36], but listed as 'obsolete or knocked-down', presumably no. **350**. None in active fleet by 1939/1942.

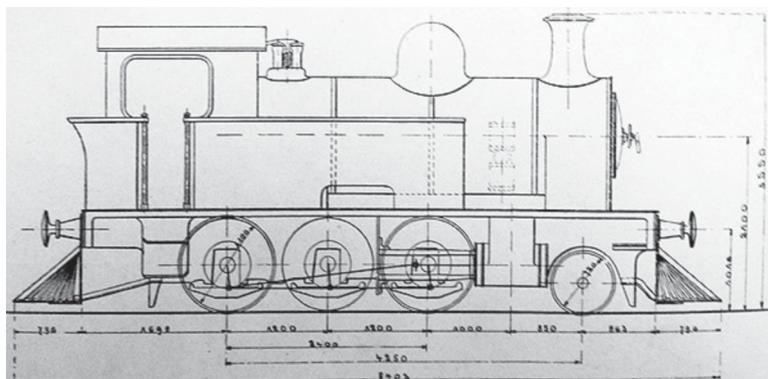
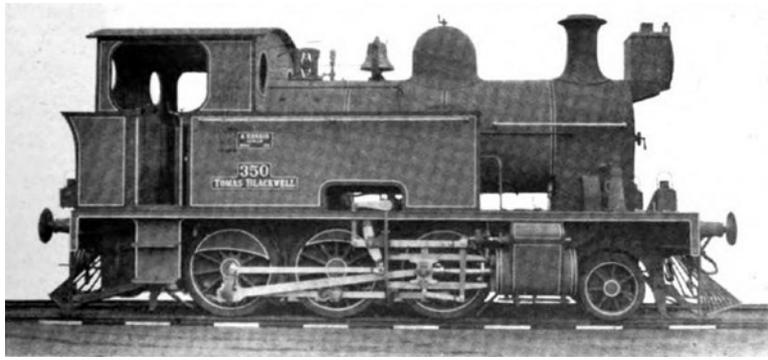


Diagram published in *The Railway Magazine*, date unknown.



Borsig publicity card pic

Tipo 48

(2nd & last batch)

4-4-0 d/w 1785mm 70¼", cyls. 450x660mm 17¾"x26", built by Borsig in 1905

352 and **353** ordered by decree 671 of 21-3-1905, with **354** added by decree 687 of 22-3-1905. These first three were part of the 30 loco contract. See MOBR1802. Remainder were ordered by decree 458 on 7-4-1905.

352 'C. WALKER'	w/n 5654	Into service December 05 [9] replacing locos ordered from <i>Fundicion Chile</i> which had not been constructed. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955 [37].
353 'M. MONTT'	w/n 5655	Into service December 05 [9] replacing locos ordered from <i>Fundicion Chile</i> which had not been constructed. Allocated to <i>Zona II</i> (MSE) in 1910. Pictured in Temuco roundhouse photo in 1932. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
354 'ANTONIO VARAS'	w/n 5656	Into service Feb 06 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942 & 1951.
355	w/n 5765	Into service Feb 06 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942 & 1951.
356	w/n 5766	Into service Feb 06 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
357	w/n 5767	Into service Feb 06 [9]. Photo shows number-plate without a name beneath. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941 & 1942. Dismantled 1950 [1951 <i>EFE</i> blue-printed list].
358	w/n 5768	Into service Feb 06 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942 & 1951.
359 'I. R. GUTIÉRREZ+'	w/n 5769	Into service Feb 06 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942 & 1951.
360	w/n 5770	Into service Feb 06 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942 & 1951.

Thirteen, **330-333** and **352-360**, listed in post-1908 diagram book [24] on page 47 (?). 13 in active fleet around 1928 [36]. 13 in active fleet in 1941 & 1942 [37]. 12 in fleet in 1951. 2 surviving in fleet in 1957 but none in 1968 [49].

Tipo 47

(3rd batch +)

0-6-0 d/w 1480mm 57", cyls. 450x660mm 17¾"x26", built by Borsig in 1906

375-382 ordered by decree 687 of 22-3-1905. **361-374** ordered by decree 458 of 7-4-1905. It is strange that the higher number locos should have been ordered first.

361	w/n 5771	Into service Dec. 05-May 06 [9]. Repaired by Balfour Lyon in 1909 [MOBR2209] at a cost of \$15,000 [<i>El Mercurio</i> 1st Sept. 1909].. Allocated to <i>Zona I</i> (MByC) in 1910.
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		Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
362	w/n 5772	Into service Dec. 05-May 06 [9]. Firebox to be repaired or replaced 1909 [<i>El Mercurio</i> 1st Sept 1909]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941 & 1942. Dismantled 1949 [1951 <i>EFE</i> blue-print loco list].
363	w/n 5773	Into service Dec. 05-May 06 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941 & 1942, and by <i>Zona</i> III (MC) in 1951 & 1955.
364	w/n 5774	Into service Dec. 05-May 06 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
365	w/n 5775	Into service Dec. 05-May 06 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
366	w/n 5776	Into service Dec. 05-May 06 [9]. Repaired by Balfour Lyon in 1909 [MOBR2209] at a cost of \$15,500 [<i>El Mercurio</i> 1st Sept. 1909] including firebox repair or replacement. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
367	w/n 5777	Into service Dec. 05-May 06 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
368	w/n 5778	Into service Dec. 05-May 06 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
369	w/n 5779	Into service Dec. 05-May 06 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> I (MByC) in 1939, 1941 & 1942, and under <i>Zona</i> III (MC) in 1951 & 1955.
370	w/n 5780	Into service Dec. 05-May 06 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> I (MByC) in 1939 & 1941, and under <i>Zona</i> III (MC) in 1942 & 1951, then under <i>Zona</i> II (MSE) in 1955.
371	w/n 5781	Into service Dec. 05-May 06 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> I (MByC) in 1939, 1941 & 1942, but under <i>Zona</i> II (MSE) in 1951 & 1955. Seen at San Bernardo in 1971-2 [32] and awaiting scrapping there in 1975 [49].
372	w/n 5782	Into service Dec. 05-May 06 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
373	w/n 5783	Into service Dec. 05-May 06 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
374	w/n 5784	Into service Dec. 05-May 06 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
375 'M. ESCOBAR+'	w/n 5785	Into service May-July 06 [9]. Allocated to <i>Zona</i> II (MSE) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
376	w/n 5786	Into service May-July 06 [9]. Repaired by SMiG in 1909 [MOBR2209] at a cost of \$16,000 [<i>El Mercurio</i> 1st Sept. 1909].

		Allocated to <i>Zona I</i> (MByC) in 1910. Loco collided with train 130 between San Pedro and Quillota on 5th July 1917 [42, year 1918 p1047]; damage unknown. Listed under <i>Zona I</i> (MByC) in 1939, 1941 & 1942, but under <i>Zona II</i> (MSE) 1951 & 1955.
377	w/n 5787	Into service May-July 06 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona II</i> (MSE) 1939, 1941, 1942, 1951 & 1955.
378 ‘E. OPAZO+’	w/n 5788	Into service May-July 06 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
379 ‘M. YAÑEZ+’	w/n 5789	Into service May-July 06 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
380	w/n 5790	Into service May-July 06 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona II</i> (MSE) 1939, 1941, 1942, 1951 & 1955. Seen at Valdivia in 1972 [20 and 32].
381	w/n 5791	Into service May-July 06 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
382	w/n 5792	Into service May-July 06 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].

77 locos listed in post-1908 *EFE* diagram book [24], **317-329, 342-349, 361-382, 388-421**. In 1918 it was reported that these locos were to change from oil to grease lubrication (of their axleboxes presumably and maybe their rod ends) and that this would save a considerable sum [42, year 1918 p1044]. 72 in active fleet around 1928 [36]. 67 in fleet in 1955, and in 1957 [49]. 37 locos in class still in fleet list in 1965, and 36 in 1968 [*EFE memorias anuales*]. 1969 instruction to withdraw all members of class becoming due for heavy repair [49]. Only 1 left by 1979 [49].

383-387 originally allotted to metre gauge stock.

Numbers 383-7 later reused for a batch of SMG-built 4-4-0s, in 1912. See below.

Tipo 47

(4th & last batch)

0-6-0 d/w 1480mm 57", cyls. 450x660mm 17¾"x26", built by Borsig in 1906

Ordered by decree 1599 of 15-12-1905. Part of the 44 loco contract negotiated by Sr. Justiniano Sotomayor via M. Gleisner & Co. [MOBR1802] notes that locos **386-9** were to be embarked on ship on 23rd June, locos **390-2** similarly on 30 June, and locos **393-4** on 7 July. Presumably 1906, though not certain.

388	w/n 5918	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
389	w/n 5919	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under to <i>Zona II</i> (MSE) in 1939, and under <i>Zona III</i> (MC) in 1941 & 1942. Dismantled 1947 [one 1951 <i>EFE</i> blue-print loco list].
390	w/n 5920	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under to <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
391	w/n 5921	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under to <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
392	w/n 5922	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Out of list before 1939, 1942; cause unknown.
393	w/n 5923	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in

		1910. Supervised by Barón 1939, 1941 & 1942, but under <i>Zona III</i> (MC) in 1951 & 1955.
394	w/n 5924	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under to <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. Shunting at Concepción in 1972 [Ron Ziel].
395	w/n 5925	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under to <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
396	w/n 5926	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under to <i>Zona III</i> (MC) in 1939 (and probably in 1941 too though the list has a misprint), 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
397	w/n 5927	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under to <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
398	w/n 5928	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under to <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
399	w/n 5929	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under to <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen at Talcahuano in 1971-2 [32].
400	w/n 5930	Into service Oct 06-March 07 [9]. Listed under <i>Zona III</i> (MC) in 1939, and at Barón in 1941 & 1942, but moved to <i>Zona II</i> (MSE) by 1951 & 1955. Seen at Concepción in 1971-2 [32], and at San Rosendo in 1968 [35].
401	w/n 5931	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under to <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955.
402	w/n 5932	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under to <i>Zona III</i> (MC) in 1939, 1941 & 1942. Dismantled 1949 [1951 <i>EFE</i> blue-print loco list].
403	w/n 5933	Into service Oct 06-March 07 [9]. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
404	w/n 5934	Into service Oct 06-March 07 [9]. Involved in a serious collision with loco 126 at the north end of the Las Palmas tunnel between Salto and Las Palmas in December 1909 [Report in <i>El Mercurio</i> , Santiago 11th December 1909]. Repaired by SMG in 1909 [MOBR2209] at a cost of \$14,970 [<i>El Mercurio</i> 1st Sept. 1909]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955.
405	w/n 5935	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
406	w/n 5936	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
407	w/n 5937	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 &

		1955. Seen at San Bernardo in steam in 1970 [Ken Mills], and 1971-2 [32]. Photographed dead in shed at MSB in 1981 [Bill Veloz]. Preserved at Parque Quinta Normal in Santiago.
408	w/n 5938	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Dismantled 1929-30 [3].
409	w/n 5939	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Supervised by Barón 1939, 1941 & 1942. One list says was under <i>Zona III</i> (MC) in 1951, was also there in 1955.
410	w/n 5940	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. At Valdivia in 1972 [20 and 32].
411	w/n 5941	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Out of list before 1939, 1942; cause unknown.
412	w/n 5942	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
413	w/n 5943	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Allocated to <i>Zona I</i> (MByC) in 1939, 1941, 1942, 1951 & 1955. However one list says Listed under <i>Zona III</i> (MC) in 1951.
414	'BENJAMÍN LÓPEZ VEGA' w/n 5944	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Supervised by Barón 1939, 1941, 1942 & 1951. However one list says was under <i>Zona III</i> (MC) in 1951, & also there in 1955.
415	'JOSÉ ANTONIO ALMARZA+' w/n 5945	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Osorno Ovejería shed in 1968 (35).
416	'B. MITRE' w/n 5946	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
417	'DOMINGO SARMIENTO' w/n 5947	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Withdrawn by 1914, cause unknown. <i>Number 417 reused in 1914 for a tipo 57 loco, see below.</i>
418	'A. EUREO' w/n 5948	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo unserviceable in 1971-2 [32].
419	'R. ESCOBAR' w/n 5949	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Supervised by Barón 1939, 1941, 1942, 1951 & 1955.
420	w/n 5950	Into service Oct 06-March 07 [9]. Allocated to <i>Zona II</i> (MSE) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
421	w/n 5951	Into service Oct 06-March 07 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.

77 locos listed in post-1908 *EFE* diagram book [24] page 59, **317-329, 342-349, 361-382, 388-421**. In 1918 it was reported that these locos were to change from oil to grease lubrication (of their axleboxes presumably and maybe their rod ends) and that this would save a considerable sum [42, year 1918 p1044]. 72 in active fleet around 1928 [36]. 71 in active fleet in 1941 & 1942 [37]. 67 in fleet in 1955, and in 1957 [49]. 37 locos in class still in fleet list in 1965, and 36 in 1968 [*EFE memorias anuales*]. 1969 instruction to withdraw all members of class becoming due for heavy repair [49]. Only 1 left by 1979 [49].

Tipo 47 withdrawals

There was an unusual level of attrition of the *tipo* 47s during their early years. **417** had been withdrawn by 1914, its number reused for a *tipo* 57, and **328** probably by 1919. An *EFE* diagram book from the 1920s states that **397** was destroyed, and that **392** and **411** had been destroyed in 1914. **408** was dismantled in 1930. Finally, **398** was listed in 1939 but not in 1942. This is unlikely to have been due merely to their known heavy tyre wear. Were they also prone to derailment? The fall in numbers continued in later years, with another four engines (**346**, **362**, **399**, and **402**) disappearing by 1955. Yet another was withdrawn ‘*excluyeron*’ in 1957, number unknown [3]. No details are known of any accidents definitely leading to these withdrawals, though a *tipo* 47 was clearly involved in the Puente de las Cucharas derailment outside Valparaiso in August 1912, when the malicious derailing of a goods train sent the loco down an embankment [*Sucesos* issue 519]. Another had earlier been involved in the serious collision with a *tipo* 57 or 58 in August 1909, between Batuco and Polpaico, when goods trains 91 and 72 met head-on [*Zigzag* issue 236].

422-431 originally allotted to metre gauge stock.

Numbers 422-5 later used in 1912 for a batch of SMG-built 4-4-0s. See below.

Numbers 426-31 later used in 1913 for tipo 57 locos. See below.

Tipo 51

(1st & only batch)

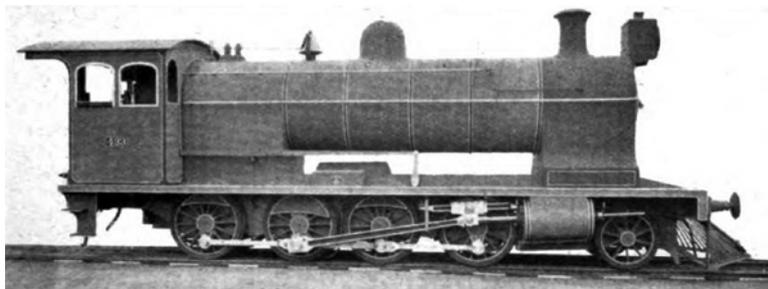
2-8-0 d/w 1250mm 49", cyls. 520x630mm, built by Borsig in 1906

Ordered by decree 5549 of 17-3-1906. These were the fourteen ‘*remolcadoras de carga*’ for the Tabón Pass that were ordered alongside the six *remolcadoras de pasajeros* that became locos **355-360**. See [MOBR1802]. 2nd & 4th drivers had side play, leading wheels were in Adams radial axleboxes. There was comment that these locos had very rigid wheel arrangements, leading to frequent derailments, and that the inside motion was difficult to maintain. The 1922 *EFE* annual *memoria* reports that an initial example was to be rebuilt at MSB with *tipo* 57 pony trucks, Baldwin *tipo* 61 type outside cylinders, Baldwin style outside valve gear, grease lubrication, superheaters, and various other improvements. If successful the remainder of the class would be similarly altered.

432	w/n 6035	Into service March 07-June 08 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Victoria in 1971-2 [32].
433	w/n 6036	Into service March 07-June 08 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
434	w/n 6037	Into service March 07-June 08 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
435	w/n 6038	Into service March 07-June 08 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
436	w/n 6039	Into service March 07-June 08 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
437	w/n 6040	Into service March 07-June 08 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in steam at Victoria in March 1972 [Ian Dunn photo].
438	w/n 6041	Into service March 07-June 08 [9]. Allocated to <i>Zona</i> I (MByC) in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in steam at Victoria in late 1969 [Ken Mills].
439	w/n 6042	Into service March 07-June 08 [9]. Allocated to <i>Zona</i> I (MByC) in

		1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. At MSB preserved in 1972 [32] and 1974 [10]. Preserved at Parque Quinta Normal in Santiago.
440	w/n 6043	Into service March 07-June 08 [9]. Repaired by SMiG in 1909 at a cost of \$16,300 [<i>El Mercurio</i> 1st Sept. 1909]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
441	w/n 6044	Into service March 07-June 08 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
442	w/n 6045	Into service March 07-June 08 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
443	w/n 6046	Into service March 07-June 08 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Temuco in 1968 [35].
444	w/n 6047	Into service March 07-June 08 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955.
445	w/n 6048	Into service March 07-June 08 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Temuco in 1969-70 [Ken Mills].

Fourteen listed in post-1908 diagram book [24] on page 45 (?) as *remolcadoras*. 14 in class in 1921, all in the 2nd zone. 14 in active fleet around 1928 [36]. 14 in active fleet in 1941, 1942, 1951 & 1955 [37]. 14 in fleet in 1957 [49]. 14 locos in class still in fleet list in 1965 and 1968 [*EFE memorias anuales*].



Borsig builder's pic, Jens Schindler collection



MCC's own photo taken at Quinta Normal museum, showing tipo 51 as rebuilt.

Tipo 52

4-6-0 d/w 1450mm 57", cyls. 450x660mm 17¾"x26", built by Borsig in 1907

(1st & only batch)

With inside cylinders as originally built. Ordered by decree 559 of 17-3-1906, alongside the fourteen *remolcadoras de carga* that became locos **432-455**. Locomotives were designated ‘*remolcadoras de pasajeros*’ for the Tabón pass section, though one source suggests that they also were used on express passenger services despite their small wheels [40]. An *EFE memoria* in 1920 p327 states “*La traccion de trenes de pasajeros se ha venido resistiendo, año tras año, por (falta?) de locomotoras pesadas. Esta deficiencia, había hecho pensar a la Direccion General en la adquisicion de (??) locomotoras de pasajeros tipo 61 (Baldwin de espreso). Posteriormente, en vista de los altos precios alcanzados por el equipo motor, (?) estimado conveniente, no adquirir nuevas locomotoras de pasajeros. En cambio, se ha estudiado la posibilidad de transformar por el momento 6 locomotoras tipo 52 (Borsig) en locomotoras de pasajeros, de características similar(?) a la Baldwin de espreso. Estas locomotoras prestan actualmente algunos servicios secundarios, en remolque, i su exclusion de estos servicios no reviste ninguna importancia.*”

- | | | |
|------------|----------|---|
| 446 | w/n 6029 | Into service May-June 08 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at San Rosendo in 1971-2 [32]. |
| 447 | w/n 6030 | Into service May-June 08 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. |
| 448 | w/n 6031 | Into service May-June 08 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. |
| 449 | w/n 6032 | Into service May-June 08 [9]. Repaired by <i>SMG</i> in 1909 [MOBR2209] including firebox repair or replacement [<i>El Mercurio</i> 1st Sept 1909]. Allocated to <i>Zona I</i> (MByC) in 1910. A 1922 photo suggests that it was rebuilt that year with outside cylinders but without the usual raised running-plate above them. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. At MSB in 1972 [32] and 1974 [10]. Seen in steam at San Rosendo in 1968 [35]. |
| 450 | w/n 6033 | Into service May-June 08 [9]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. |
| 451 | w/n 6034 | Into service May-June 08 [9]. Repaired by <i>SMG</i> in 1909 [MOBR2209] at a cost of \$15,000 [<i>El Mercurio</i> 1st Sept. 1909]. Allocated to <i>Zona I</i> (MByC) in 1910. Listed under <i>Zona III</i> (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at San Rosendo in 1971-2 [32]. |

Six listed in post-1908 diagram book [24]. 6 in class in 1921, all in the 1st zone. Three had been rebuilt by that year, with the remainder being worked on [34]. Some reports designate them as tipo 52R after rebuilding [50]. All transferred south after electrification of Santiago to Valparaiso in 1924 [48]. 6 in active fleet around 1928 [36]. 6 in active fleet in 1941, 1942, 1951, & 1955 [37], and in 1957 [49]. 4 locos in class still in fleet list in 1965 and 1968 [*EFE memorias anuales*].

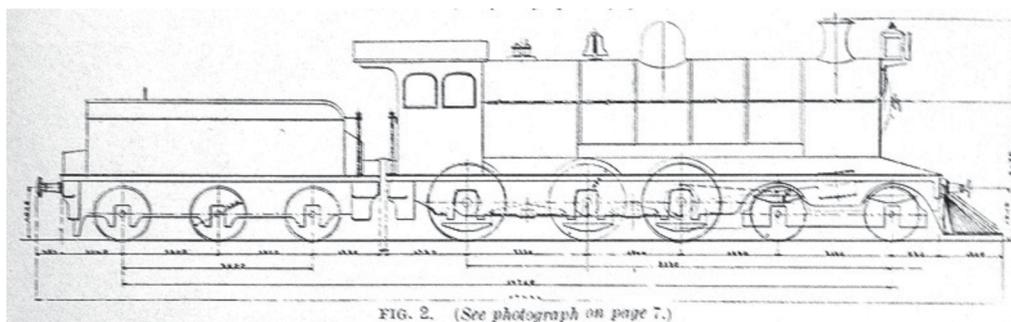
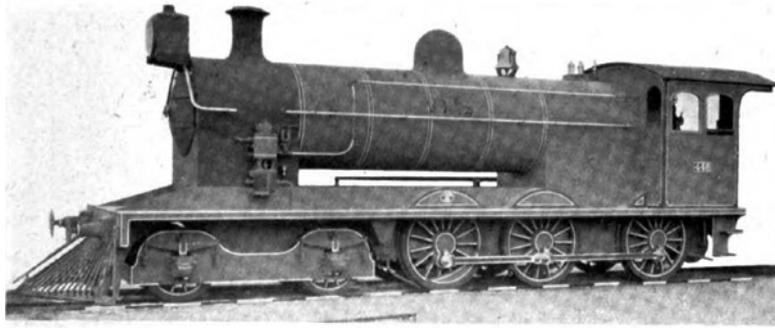


FIG. 2. (See photograph on page 7.)

Diagram published in *The Railway Magazine* at an unknown date.



Borsig builder's pic, Jens Schindler collection

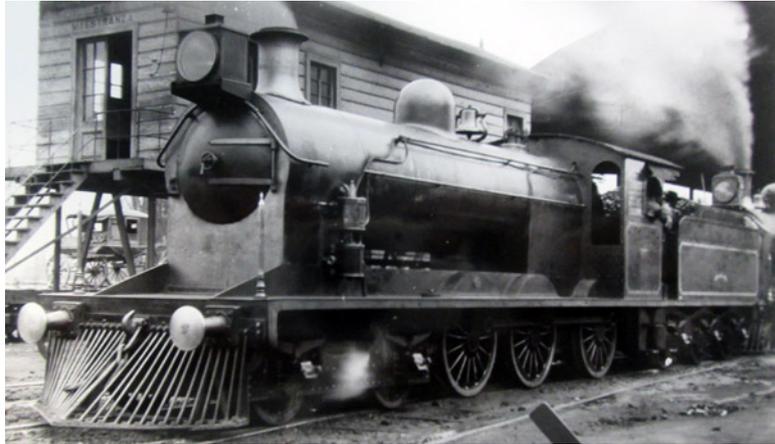
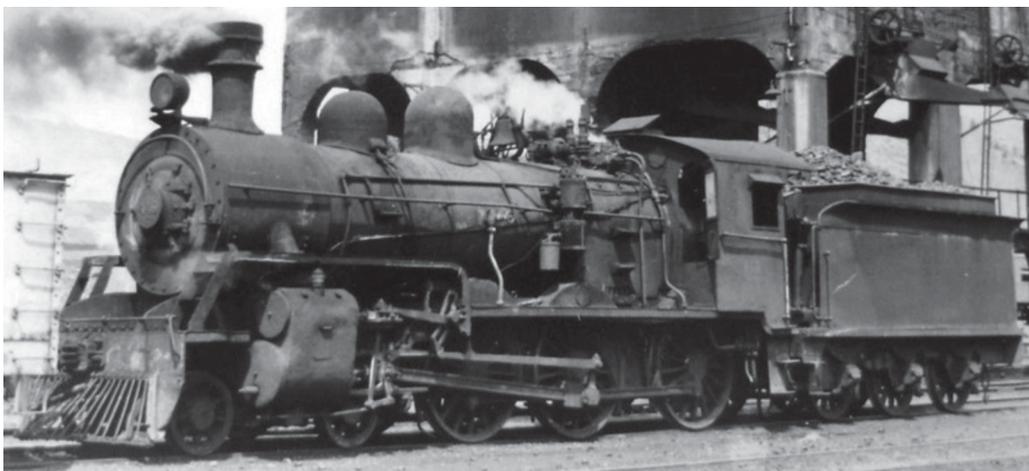
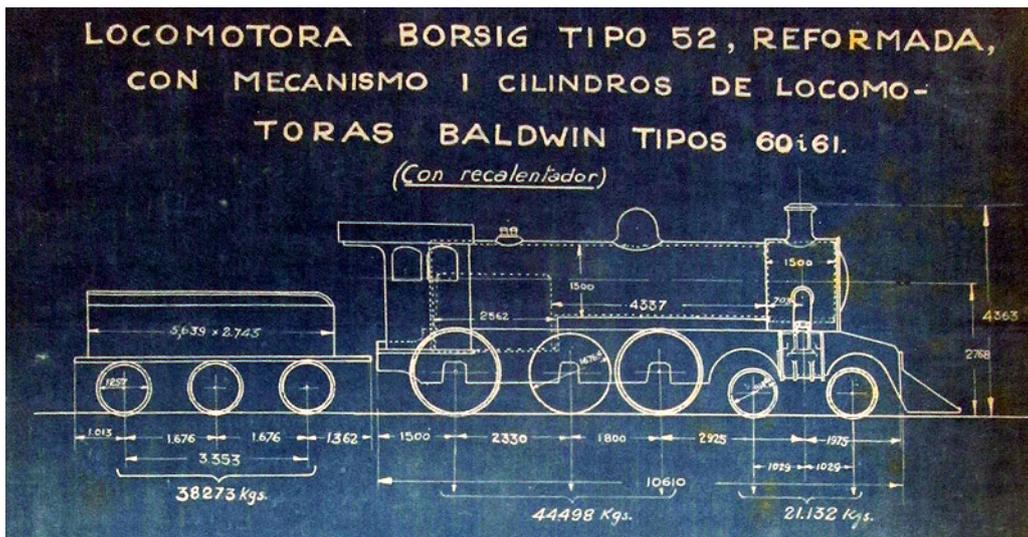
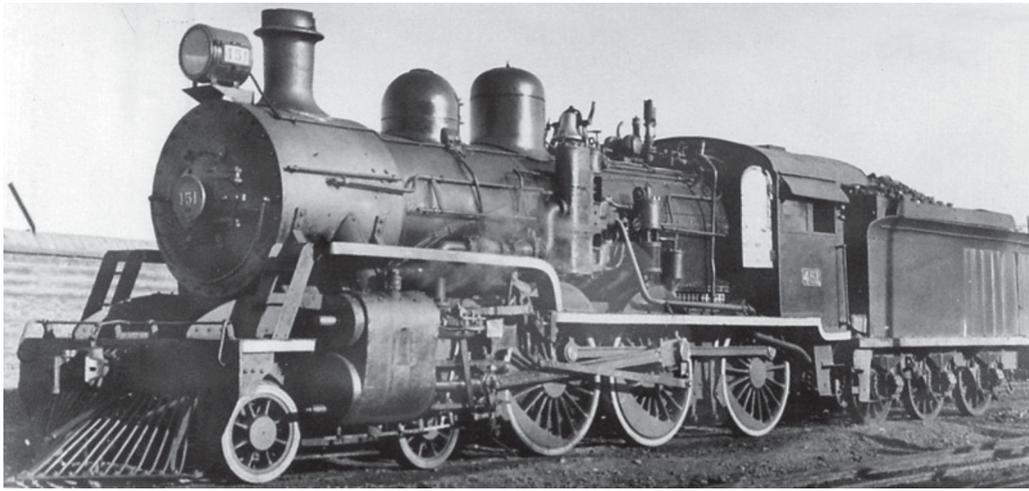


Photo by P.C. Dewhurst, possibly around the time of the First World War.





Tipo 52R number **451** with a taller dome and a Worthington feedwater heater midway along the boiler.

452-456 allotted to metre gauge stock.

Numbers 452-5 reused in 1914 for tipo 57 locos, see below.

Tipo 53

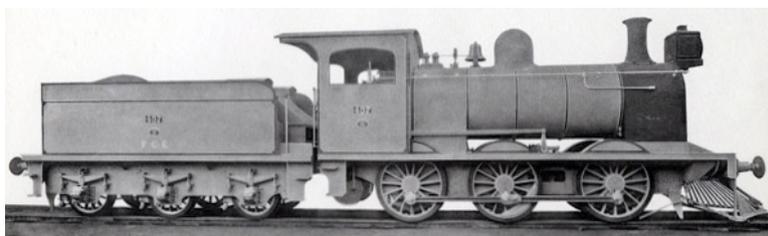
(1st & only batch)

0-6-0 d/w 1400mm 55", cyls. 425x640mm 16³/₄"x25¹/₄", built by Borsig in 1908

Ordered by decree of 7-5-1905.

457	'BROUGHETIORES'? w/n 6658	Into service May-June 08 [9]. Allocated to Zone 3 in 1910. Loco with this number recorded as ' <i>detenidas</i> ' at MSB (withdrawn?) during 1923 [3]. Sold to Braden Copper Co. in 1929 [3], presumably for scrap. Name is as given in source [25] but not confirmed from anywhere else. Note that the Borsig works' photo below does not show a name, suggesting that it was not named at that stage.
458	w/n 6659	Into service May-June 08 [9]. Allocated to <i>Zona III</i> (MC) in 1910. Loco with this number recorded as ' <i>detenidas</i> ' at MSB (withdrawn?) during 1923 [3]. Sold to Braden Copper Co. in 1929 [3], presumably for scrap.
459	w/n 6660	"Into service May-June 08 [9]. Allocated to <i>Zona III</i> (MC) in 1910. Loco with this number recorded as ' <i>detenidas</i> ' at MSB (withdrawn?) during 1923 [3]. Sold to Braden Copper Co. in 1929 [3], presumably for scrap.
460	w/n 6661	Into service May-June 08 [9]. Allocated to <i>Zona III</i> (MC) in 1910. Sold to Braden Copper Co. in 1929 [3], presumably for scrap. Loco with this number engaged in electrification works train duties in 1931 [3].
461	w/n 6662	Into service May-June 08 [9]. Allocated to <i>Zona III</i> (MC) in 1910. Involved in fatal collision with loco 616 , whilst hauling <i>tren 127</i> , between Afquintue and Loncoche, on 11th November 1916[42]. Loco with this number recorded as ' <i>detenidas</i> ' at MSB (withdrawn?) during 1923 [3]. Sold to Braden Copper Co. in 1929 [3], presumably for scrap.

Five listed in post-1908 diagram book [24] on page 44 (?). 5 in fleet around 1928 [36] but listed as 'obsolete or knocked-down'. None in active fleet in 1939 or 1942.



Borsig's temporary monopoly

This was the end of the three year period during which all orders had gone to Borsig of Berlin, through the agents *M. Gleisner i Cía.*, and during which 117 broad gauge and 21 metre gauge locos had been purchased by the *EFE*. Whilst that phenomenon has been widely attributed to corruption, the poor quality of the Lever Murphy metre gauge 4-6-0s built around 1900 might have made the *EFE* prefer a tried and tested builder in the following years rather than risking less well-known manufacturers.

Baldwin proposals

The collection of Baldwin drawings at the DeGolyer Library, Southern Methodist University, includes side elevation drawings for several designs proposed for the *EFE* around 1907-1909. The identification details for these drawings and for a number of others are given at the very end of the *EFE* list on page 148 of this file.

The first was for a 4-6-0 design, possibly what became the *tipo 58 North British de pasajeros* or perhaps the *tipo 60* that was eventually built by Baldwin a year or two later. Then there is a drawing for a 2-6-4, probably a tank loco. The last of these three is for a large 2-8-8-2 Mallet. Whilst the first two were almost certainly broad gauge proposals, the third drawing might just have been for the metre gauge.

Tipo 54

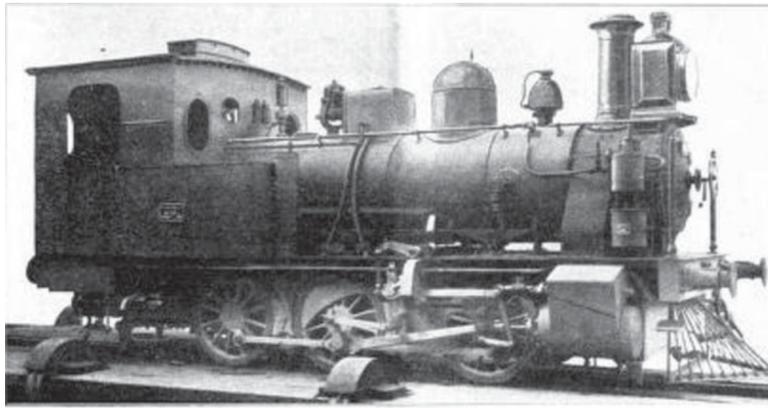
(1st & only batch)

0-6-0T d/w 1100mm 43¼", cyls. 350x480mm 13¾"x18¾", built by Hanomag in 1908

Ordered by decree 1 of 10-1-1908, via Saavedra Benard i Cía.

462	w/n 5216	Allocated to <i>Zona IV (MV)</i> in 1910. Listed under <i>Zona III (MC)</i> in 1939, 1941, 1942, 1951 & 1955. Seen at Temuco in 1971-2[32] and 1973 [ERS]. At Osorno in 1974 [10], 1976 and 1977 [21]. Seen in steam at Osorno Ovejera depot in 1979 [K. R. Chester]. Plinthed at Osorno station.
463	w/n 5217	Allocated to <i>Zona IV (MV)</i> in 1910. Listed under <i>Zona III (MC)</i> in 1939, 1941, 1942, 1951 & 1955. Seen at San Rosendo in steam in 1970 [Ken Mills] and at Victoria in 1972 [Ron Ziel], 1974 [10], 1976 [35] and 1978 [22]. Preserved in Temuco Railway Museum.
464	w/n 5218	Allocated to <i>Zona IV (MV)</i> in 1910. Listed under <i>Zona III (MC)</i> in 1939, 1941, 1942, 1951 & 1955.
465	w/n 5219	Allocated to <i>Zona IV (MV)</i> in 1910. Listed under <i>Zona III (MC)</i> in 1939, 1941, 1942, 1951 & 1955.
466	w/n 5220	Allocated to <i>Zona IV (MV)</i> in 1910. Listed under <i>Zona III (MC)</i> in 1939, 1941, 1942, 1951 & 1955. At Osorno in 1972 [20 and 32].

Five listed in post-1908 *EFE* diagram book [24] page 58 (?). 5 in active fleet around 1928 [36]. 5 in active fleet in 1942, 1951 & 1955 [37], and in 1957 [49]. 4 locos in class still in fleet list in 1965 and 1968 [*EFE memorias anuales*].



Comparison with later photos showed that these locos eventually received new cabs with a more angular doorway, sand-domes instead of square sandboxes, traditional manually-operated bells, stovepipe chimneys, centre buffer-couplers of course, and a front footboard for a shunter rather than the cow-catcher shown here.

Tipo 55

(1st batch +)

2-6-0 d/w 1422mm 56", cyls. 432x609mm 17"x24", built by Baldwin in 1907

Ordered by decree 504 of 3-5-1907, through Wessel Duval Cía. BLW class 8 28 D 251-270. BLW class 08-28D nos. 251-270. Spec. is in vol. 30 p272. Erecting card drawing 467-83 is in the DeGolyer Library collection.

467	w/n 31735	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona IV</i> (MV) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942 & 1951. However, one list clearly gives this number of this class as being supervised by MSB in 1951, as does another list in 1955. Seen at San Bernardo in 1971-2 [32].
468	w/n 31736	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona IV</i> (MV) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955.
469	w/n 31737	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona IV</i> (MV) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955.
470	w/n 31738	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona IV</i> (MV) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1942, 1951 & 1955.
471	w/n 31739	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona IV</i> (MV) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955.
472	w/n 31740	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona IV</i> (MV) in 1910. Reconstructed at Valdivia shops in 1910 [1]. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955.
473	w/n 31741	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona IV</i> (MV) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955.
474	w/n 31742	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona IV</i> (MV) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955.
475	w/n 31743	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona IV</i> (MV) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955.
476	w/n 31744	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona IV</i> (MV) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen at Valdivia in 1972 [20 and 32].
477	w/n 31804	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona IV</i> (MV) in 1910. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1942 & 1951, and under <i>Zona III</i> (MC) in 1955.
478	w/n 31805	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona IV</i> (MV) in 1910.

		Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955. Plinthed on seafront in Puerto Montt.
479	w/n 31806	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona</i> IV (MV) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
480	w/n 31818	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona</i> IV (MV) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
481	w/n 31819	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona</i> IV (MV) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942 & 1951, and under <i>Zona</i> III (MC) in 1955. Seen at Temuco in 1972 [32], and 1974 when photographed by Tommy Farr [10], and in steam at Temuco in 1976 [35 & ERS] and 1977 [Raymond Marsh] [John West].
482	w/n 31820	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona</i> IV (MV) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942 & 1951, and under <i>Zona</i> III (MC) in 1955.
483	w/n 31821	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona</i> IV (MV) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942 & 1951, and under <i>Zona</i> III (MC) in 1955.
484	w/n 31845	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona</i> IV (MV) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
485	w/n 31895	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona</i> IV (MV) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.
486	w/n 32019	Into service Dec 07-Jan 08 [9]. Allocated to <i>Zona</i> IV (MV) in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955.

A builders' photo in the Pennsylvania Railroad Museum collection (no. 03163), showing a loco looking like a *tipo* 55 and supposedly built for Chilean State Ry., implies that one of these locos was originally named '**LAURELA**' (painted on the cabside). However, a *Cía. de los Ríos de Curanilahue* 2-6-0 of 1909 was named '**LAURELA**', so it is much more likely to have been that loco. Twenty listed in post-1908 *EFE* diagram book [24]. 20 in class in 1921, all in *Zona* II. 21 in active fleet around 1928 [36], presumably after construction of no. **492**, possibly from spare parts, during 1920s (See below). However, no. **492** might have been ex the contractor *Allard Dolfus Sillard et Wiriot*, since their loco '**LUZ**' was identical to *tipo* 55. 21 in active fleet in 1941, 1942, 1951 & 1955 [37]. 20 surviving in fleet in 1957 [49]. 9 locos in class still in fleet list in 1965, and 8 in 1968 [*EFE memorias anuales*].





MCC's own photo, showing **478** plinthed at Puerto Montt.

Tipo 56 (maniobras)

(1st & only batch)

0-6-0T d/w 1016mm 40", cyls. 381x559mm 15"x22", built by Baldwin in 1907

Ordered by decree 504 of 3-5-1907, through Wessel Duval y Cía. BLW class 06-24D nos. 89-93. Spec. is in vol. 30 p273. Erecting card drawing 473A-58 is in the DeGolyer Library collection.

- | | | |
|------------|-----------|--|
| 487 | w/n 31915 | Into service March-June 08 [9]. Allocated to <i>Zona IV</i> in 1910. In <i>Zona IV</i> in 1921. Listed under MSB 1939, 1942, 1951 & 1955, probably as a works shunter. Seen at San Bernardo in 1971-2 [32]. At Temuco in 1974 [10], 1977 [Raymond March] [John West] and 1978 [22]. Survives at Valdivia, under overhaul. |
| 488 | w/n 31916 | Into service March-June 08 [9]. Allocated to <i>Zona IV</i> in 1910. In <i>Zona IV</i> in 1921. Listed under MSB 1939, 1942, 1951 & 1955, probably as a works shunter. Seen at San Bernardo in 1971-2 [32]. Seen in steam at Temuco in 1979 [Keith Chester photo] and 1981 [35]. Survives at Concepción. |
| 489 | w/n 31947 | Into service March-June 08 [9]. Allocated to <i>Zona IV (MV)</i> in 1910. In <i>Zona IV (MV)</i> in 1921. Supposedly an MSB pilot for many years [22]. Listed under MSB 1939, 1942, 1951 & 1955, probably as a works shunter. Seen at San Bernardo in 1971-2 [32] and 1990 [35]. Apparently the last steam loco to receive repairs at MSB, in May 1985 [49]. Preserved in Santiago, and was displayed in the Estación Central for the Día del Patrimonio Cultural in 2018. |
| 490 | w/n 31948 | Into service March-June 08 [9]. Allocated to <i>Zona IV (MV)</i> in 1910?. In <i>Zona IV (MV)</i> in 1921. Listed under MSB 1939, 1942 & 1951, probably as a works shunter. However, another 1951 list misses this number out and says supervised by San Eugenio, though giving the other three as supervised by MSB, confirmed by 1955 list. Seen at San Bernardo in 1969-70 in steam [Ken Mills] and 1971-2 [32], and in steam at MSB in 1974 [Tommy Farr]. |
| 491 | w/n 31949 | Into service March-June 08 [9]. Allocated to <i>Zona IV (MV)</i> in 1910. In <i>Zona IV (MV)</i> in 1921. Listed under <i>Zona I (MByC)</i> in 1939 & 1942, but under <i>Zona II (MSE)</i> in 1951 & 1955. Supposedly an MSB pilot for many years [22]. Seen at Osorno in 1968 (DTR), 1972 [20 and 32]. Certainly in steam at MSB in 1977 [Raymond Marsh]. |

Five listed in post-1908 *EFE* diagram book [24] page 52 (?). 5 in class in 1921, all in the *Zona IV*. 5 in active fleet

around 1928 [36]. 5 in active fleet in 1942 & 1955 [37], and in 1957 [49]. 5 locos in class still in fleet list in 1965 and 1968 [*EFE memorias anuales*]. One of these locos is plinthed without its tanks at Parque Laguna San Pedro in the Octava Región.



BLW archive pic; hi-res versions available from Railroad Museum of Pennsylvania.

492-493 originally allotted to metre gauge stock.

Tipo 15

4-4-0 d/w 1676mm 66", 381x609mm 15"x24"

492¹ This appears in the post-1909 diagram book along with **68-70, 100-105, 261-274**. No other details known. Possibly assembled from spare parts around 1912? Arturo Squire clearly thought that it had been acquired from the *DOP* around 1907, but makes no suggestion to its origin.

as

Probably withdrawn during 1920s as *number 492 was reused for an additional tipo 55 loco during that decade.*

Tipo 67

(1st batch +)

The 1921 *EFE memoria* mentions a *tipo 67*, no. **493**, '*de pequeña potencia*' in use for special services in the 4th zone. The re-use of a metre gauge number probably means that it entered the *EFE* fleet after 1908, and possibly after 1911. This was probably a Manning Wardle 0-4-0ST, possibly from the pair used on the Valdivia to Osorno construction works; see also no. **638** below. This hypothesis is reinforced by the fact that one small loco at Valdivia around 1900 was named '**MANUEL OSSA**' after the contractor on that section and P. C. Dewhurst's list of broad gauge loco names gives the name of loco **493** as '**MANUEL OSSA**'.

0-4-0ST d/w 33¾", cyls. 10½x16", built by Manning Wardle in 1893-4.

493 'MANUEL OSSA' w/n 1266 or 1281

638 " w/n 1266 or 1281

A loco **493** was to be '*canjeada*' as a steam shovel by a Señor R. Findlay in 1941 [3]. Presumably this means sold, for the boiler to be used.

Tipo 57 'North British de carga'

(1st batch +)

2-6-0 d/w 1422mm 56", cyls. 457x660mm 18"x26", built by NBL in 1908

Constructed at NBL's Hyde Park Works (**494-533**) or Atlas Works (**534-48**). Ordered by decree 10 of 10-1-1908, via the agent Domingo Merry de Val, though dated 6th February 1908 in NBL order book. Designated NBL order no. L297, but this was later deleted in order book perhaps because these locos were part of the single order L296 with the *tipo 58* 4-6-0s. Delivery was to be 20 in August and 20 in September. Decreto 2,438 of October 15 authorised payment of £61,500 to NBL for 40 locomotives (NB may have been a part payment). There was also a reference to a payment to NBL for changing copper fireboxes on 20 locos?? All of this class were later rebuilt with piston valves, outside steam pipes and with the brake pumps moved back from the left side of the smokebox to the firebox. A very few, both of this class and of *tipo 58*, were further rebuilt with integral piston valve chests within the cylinder blocks. This

would have greatly reduced the clearance volume and thus the steam consumption but was only applied to a few locomotives. *Tipo 57* nos. **578** and **603** received this later modification.

- 494** w/n 18464 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Concepción in 1971-2 [32].
- 495** w/n 18465 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32]. Seen by me on shed at Victoria in 1975.
- 496** w/n 18466 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 497** w/n 18467 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Concepción in 1971-2 [32].
- 498** w/n 18468 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona II* (MSE) in 1939, but under *Zona III* (MC) in 1941, 1942, 1951 & 1955. Seen at Lirquen in 1971-2 [32]. Seen at Victoria in 1974 [10].
- 499** w/n 18469 Into service April-May 09 [9]. Allocated to *Zona II* in 1910. Listed under *Zona II* (MSE) in 1939, but under *Zona III* (MC) in 1941, 1942, 1951 & 1955.
- 500** w/n 18470 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Valdivia [20] and Osorno [32] in 1972. In steam on Lonquimay branch in 1981 [Geoff Hall]. Survives at Victoria.
- 501** w/n 18471 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 502** w/n 18472 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona II* (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen on shed at San Bernardo in 1969 [MJFinch].
- 503** w/n 18473 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona I* (MByC) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
- 504** w/n 18474 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 505** w/n 18475 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at San Rosendo in 1971-2 [32].
- 506** w/n 18476 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in steam at Concepción in 1968 [35] and 1971-2 [32].
- 507** w/n 18477 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 508** w/n 18478 Into service April-May 09 [9]. Allocated to *Zona III* in 1910. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. Late in its career was allocated to Lebu and equipped with a bogie tender to facilitate tender-first running on poor track [31].
- 509** w/n 18479 Into service April-May 09 [9]. Allocated to *Zona III* in 1910.

- Listed under *Zona* III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in steam at Victoria in 1981 [Geoff Hall].
- 510** w/n 18480 Into service April-May 09 [9]. Allocated to *Zona* II in 1910. or *Zona* III? Listed under *Zona* II (MSE) in 1939, 1941, 1942, 1951 & 1955.
- 511** w/n 18481 Into service April-May 09 [9]. Allocated to *Zona* III in 1910. Listed under *Zona* II (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
- 512** w/n 18482 Into service April-May 09 [9]. Allocated to *Zona* III in 1910. Listed under *Zona* II (MSE) in 1939, 1941, 1942, 1951 & 1955. Photographed in steam at Peumo during 1940s, on Pelequen to Las Cabras branch north of San Fernando. Seen in steam at Collipulli in 1981.
- 513** w/n 18483 Into service April-May 09 [9]. Allocated to *Zona* III in 1910. Listed under *Zona* III (MC) in 1939, 1941, 1942, 1951 & 1955.
- 514** w/n 18484 Into service April-May 09 [9]. Allocated to *Zona* I in 1910. Listed under *Zona* I (MByC) in 1939, 1941, 1942, 1951 & 1955. Seen at San Rosendo in 1971-2 [32].
- 515** w/n 18485 Into service April-May 09 [9]. Allocated to *Zona* I in 1910. Listed under *Zona* II (MSE) in 1939, 1941, 1942, 1951 & 1955. Photographed in steam at Pichilemu (Palmilla?) in 1952. Seen at San Rosendo in 1971-2 [32]. Seen in steam at Coigue in 1977 on a train to Mulchen [Raymond Marsh].
- 516** w/n 18486 Into service April-May 09 [9]. Allocated to *Zona* I in 1910. Listed under *Zona* III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
- 517** w/n 18487 Into service April-May 09 [9]. Allocated to *Zona* I in 1910. Listed under *Zona* II (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
- 518** w/n 18488 Into service April-May 09 [9]. Allocated to *Zona* I in 1910. Listed under *Zona* II (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen at San Rosendo in 1971-2 [32] and in steam at Curacautín in 1981. Survives at Carahue.
- 519** w/n 18489 Into service April-May 09 [9]. Allocated to *Zona* I in 1910. Listed under *Zona* III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32] and on Lonquimay line in 1976.
- 520** w/n 18490 Into service April-May 09 [9]. Allocated to *Zona* I in 1910. Listed under *Zona* II (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32], and on Lonquimay line in 1981.
- 521** w/n 18491 Into service April-May 09 [9]. Allocated to *Zona* I in 1910. Listed under *Zona* II (MSE) in 1939, 1941, 1942 & 1951. However one list says under *Zona* III (MC) in 1951. Solely listed under *Zona* III (MC) in 1955. Seen at Coigue in 1971-2 [32].
- 522** w/n 18492 Into service April-May 09 [9]. Allocated to Zone 1 in 1910. Listed under *Zona* III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Santa Fe in 1971-2 [32, and Ron Ziel], and at Victoria in Sept. 1979 [KRC] and 1981 [Helmut Dahlhaus].
- 523** w/n 18493 Into service April-May 09 [9]. Allocated to *Zona* I in 1910.

		Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen at San Rosendo in 1971-2 [32].
524	w/n 18494	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. SListed under <i>Zona</i> II (MSE) in 1939, 1941, 1942 (though number is mis-printed as 534 in the latter table), 1951 & 1955.
525	w/n 18495	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. Pictured in Temuco roundhouse photo in 1932. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.
526	w/n 18496	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen at San Rosendo in 1971-2 [32] and on Lonquimay line in 1976.
527	w/n 18497	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. Rebuilt as 2-6-2 <i>tipo</i> 57R in late 1920s or early 1930s, see below.
528	w/n 18498	Into service April-May 09 [9]. Allocated to Zone 1 in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Coigue in 1971-2 [32] and in steam at Victoria in 1981 [Helmut Dahlhaus].
529	w/n 18499	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941 & 1942, and under <i>Zona</i> III (MC) in 1951 & 1955. Seen in steam at Los Sauces in 1968 [35].
530	w/n 18500	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. First of its type to be super-heated, in 1921. Rebuilt as 2-6-2 <i>tipo</i> 57R in late 1920s or early 1930s, see below.
531	w/n 18501	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen on shed at Valdivia in 1968[by DTR]. Seen at Valdivia in 1974 [10].
532	w/n 18502	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen on Lonquimay line in 1981. Preserved in Temuco Railway Museum.
533	w/n 18503	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1942, 1951 & 1955.

All of the above listed in post-1908 *EFE* diagram book [24] page 61 (?). 113 in active fleet around 1928 [36]. 114 in active fleet in 1942 [37]. 112 in active fleet in 1951 & 1955, and in 1957 [49]. 111 locos in class still in fleet list in 1965, and 112 in 1968 [*EFE memorias anuales*]. Around 100 left in 1979 [49].



NBL builder's photo found in ETH Zurich archive. Loco is no. **498**.

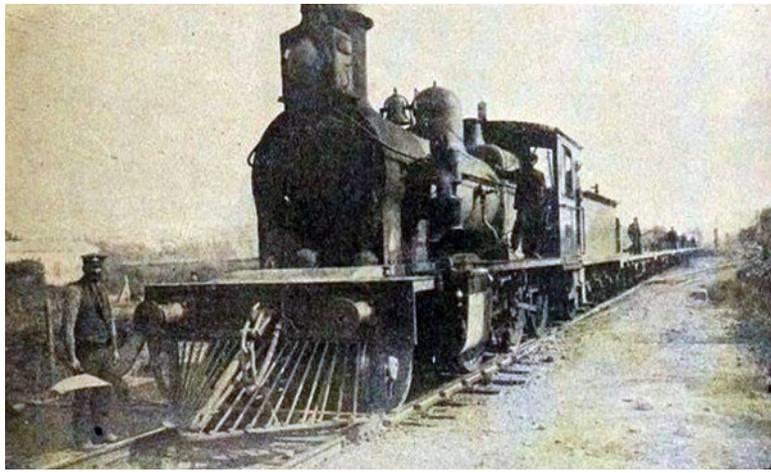
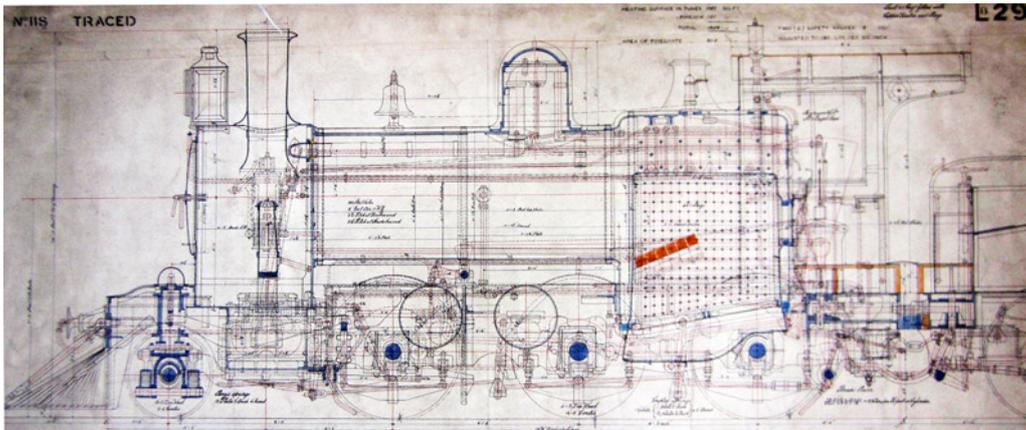
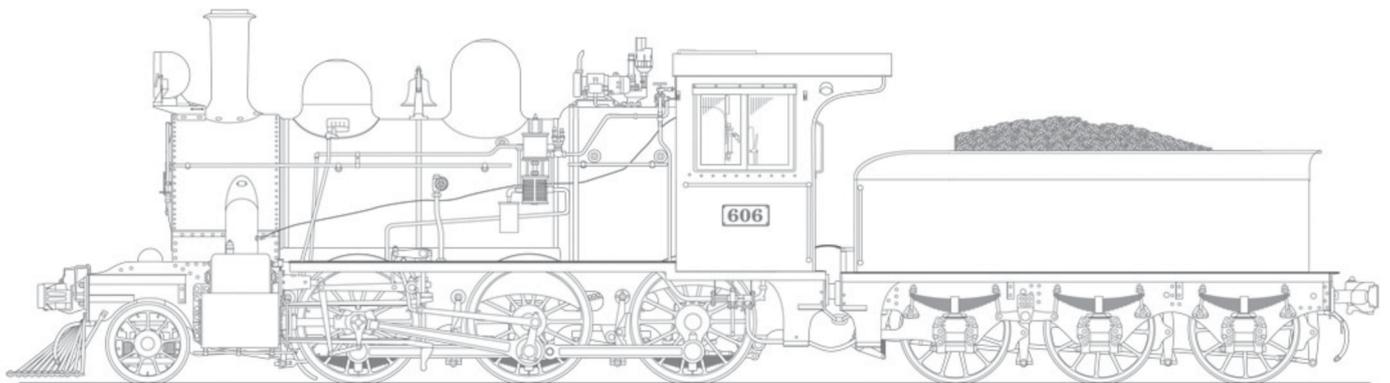


Photo shows a *tipo 57* in original condition, with slide valves, and air pump on smokebox.



A number of NBL drawings are available, either from the University of Glasgow Business Studies archives library or from the NRM in York. This one shows a *tipo 57* loco as built.



This modern drawing shows a *Tipo 57* loco during its later years, with bolt-on piston valve chest and outside steam pipes thus requiring the brake pump to be moved back to the firebox. In addition the engine carries knuckle couplers, a standard sand dome and electric headlight and turbo-generator.

Tipo 57R

(1st & only batch)

2-6-2 d/w 1422mm 56", cyls. 457x660mm 18"x26", built by NBL Hyde Park Works (494-533) or Atlas Works (534-48) in 1908. *Tipo 57* locos from above batch rebuilt with larger fireboxes and trailing trucks, becoming 2-6-2s. Work done in late 1920s, early 1930s? No further locos were rebuilt, as superheating and the fitting of piston valves was a cheaper method of increasing power output.

527 w/n 18497 Listed under *Zona III (MC)* in 1939, 1941, 1942, 1951 & 1955. Seen at San Rosendo in 1971-2 [32]. Seen at Victoria in 1969-70 [Ken

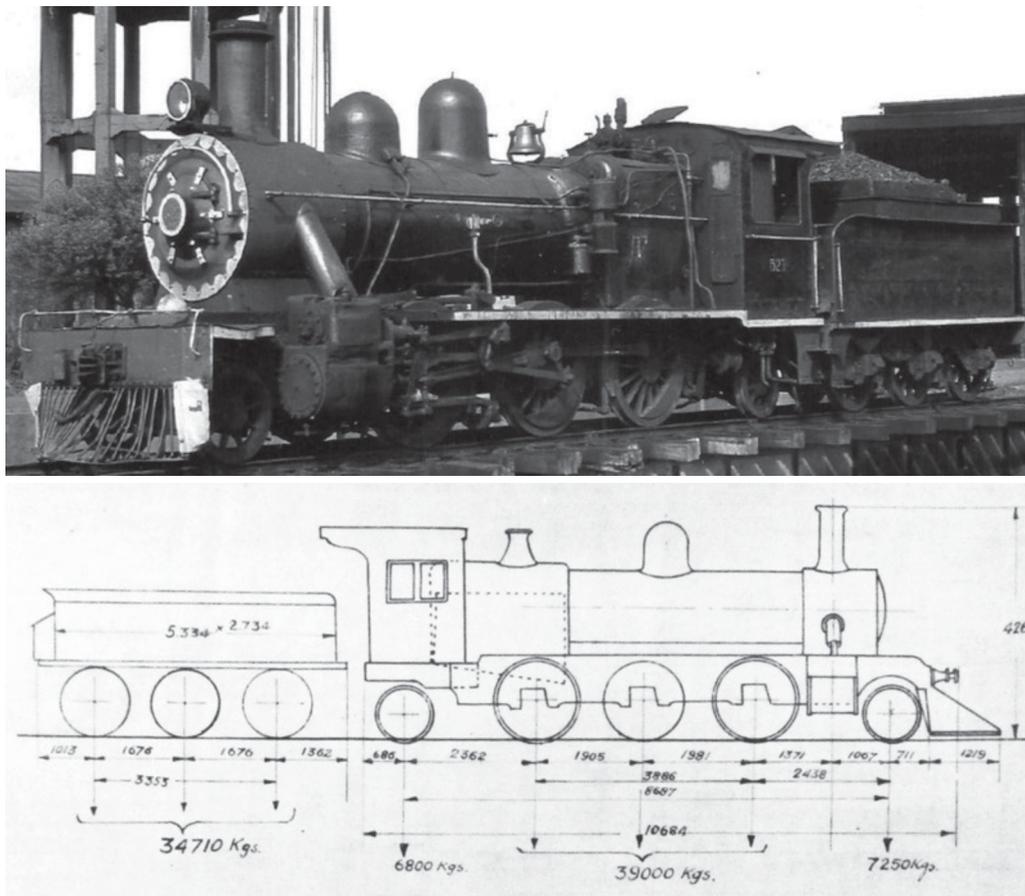
530

w/n 18500

Mills] 1974 [10 & Tommy Farr] and 1978 [22].

Listed under *Zona III (MC)* in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32]. Seen at Victoria in 1975 [CRJ] and 1976 [35], and Sept. 1979 [KRC].

One in active fleet around 1928 [36]. 2 in active fleet in 1939, 1941, 1942, 1951 & 1955.



From an EFE diagram sheet.

Tipo 58

(1st batch +)

4-6-0 d/w 1676mm 66", cyls. 483x660mm 19"x26", built by North British at Atlas Works in 1908

Ordered by decree 551 of 20-12-1907, via the agent Domingo Merry de Val. Order dated 6th February 1908 in NBL order book. NBL order no. L296. Delivery was to be in August and September. There may have been other names allocated to individual engines. It is believed that all the *tipo 58s* were rebuilt in the 1920s with ‘bolt-on’ piston valve chests and outside steam pipes, in the same way as the *tipo 57s*. A very few, both of this class and of *tipo 57*, were further rebuilt with integral piston valve chests within the cylinder blocks. This would have greatly reduced the clearance volume and thus the steam consumption but was only applied to a few locomotives.

534

w/n 18449

Into service April-May 09 [9]. Allocated to *Zona I* in 1910. Pictured in Temuco roundhouse photo in 1932. Listed under *Zona III (MC)* in 1939, 1941, 1951 & 1955. Seen at Temuco in 1971-2 [32]. Survived at Ovejería in Osorno 2013, but since moved elsewhere.

535 ‘OMER HUET’

w/n 18450

Into service April-May 09 [9]. Allocated to *Zona I* in 1910. Señor Omer Huet was a well-known engineer of Belgian origin and had been the chief inspector of railways. Listed under *Zona III (MC)* in 1939, 1941, 1951 & 1955.

536

w/n 18451

Into service April-May 09 [9]. Allocated to *Zona I* in 1910. Listed under *Zona III (MC)* in 1939, 1941, 1951 & 1955.

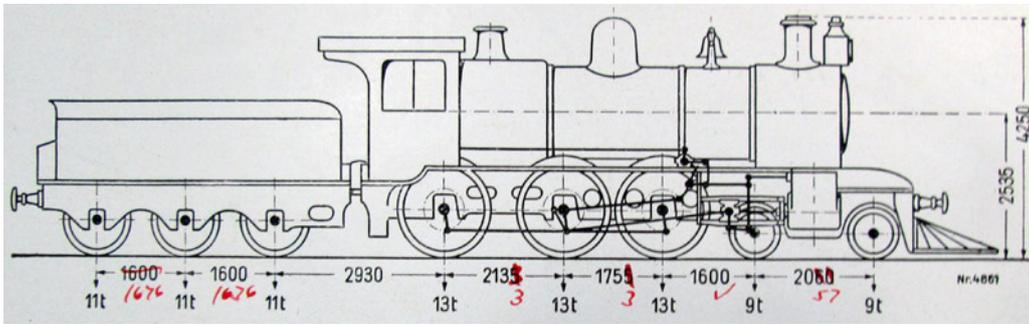
537 ‘FEDERICO STUVEN’

w/n 18452

Into service April-May 09 [9]. Allocated to *Zona I* in 1910.

		Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955. Seen at Concepción in 1971-2 [32].
538	w/n 18453	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955.
539	w/n 18454	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. [6] states that 539 was a rebuild at Sant. Shops in 1910 of an English loco. ??? Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955. Seen at Coigue in 1971-2 [32], and also Valdivia 1971 [ERS]. Seen at Victoria in 1974 [10 & Tommy Farr].
540	w/n 18455	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955.
541	w/n 18456	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955. Seen on shed at San Bernardo in 1969 [MJFinch].
542	w/n 18457	Into service April-May 09 [9]. Allocated to <i>Zona</i> I in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955. Seen on Lonquimay line in 1976 [35] and 1977 [ERS].
543	w/n 18458	Into service April-May 09 [9]. Allocated to <i>Zona</i> II in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955.
544	w/n 18459	Into service April-May 09 [9]. Allocated to <i>Zona</i> II in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955. Seen at Concepción in Dec. 1969 [Ken Mills].
545	w/n 18460	Into service April-May 09 [9]. Allocated to <i>Zona</i> II in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955. Seen in steam at Temuco in 1979 [Keith Chester photo] and at Pua in same year.
546	w/n 18461	Into service April-May 09 [9]. Allocated to <i>Zona</i> II in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955. In steam at Monte Aguila in 1972 [Ron Ziel], and at Loncoche in 1976-7 [Raymond March].
547	w/n 18462	Into service April-May 09 [9]. Allocated to <i>Zona</i> II in 1910. Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955. Seen at Temuco in 1974 [10].
548	w/n 18463	Into service April-May 09 [9]. Collided with a <i>tipo</i> 38 near Linderos in May 1909, suffering substantial damage. One loco was hauling the overnight train 38 from Talcahuano, whilst the other was at the head of freight no. 28 [Zigzag issue 221]. Allocated to <i>Zona</i> II in 1910. Listed under <i>Zona</i> III (MC) in 1939, seemingly under <i>Zona</i> II (MSE) in 1941, but back under <i>Zona</i> III (MC) in 1951 & 1955. In steam at Victoria in 1972 [Ron Ziel], and on Villarica branch in 1976-7 [Raymond March].

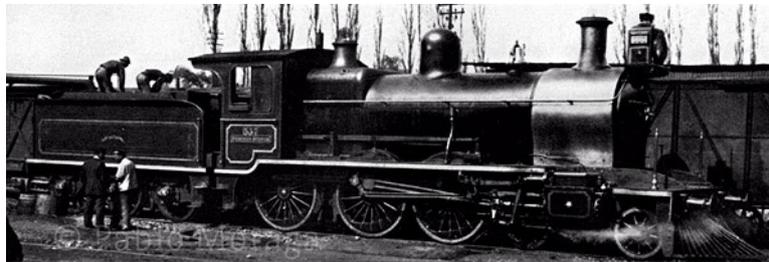
All of the above listed in post-1908 *EFE* diagram book [24] page 62 (?). 25 in class in 1921, 7 in the 1st zone, 15 in the 2nd zone, 3 in the 3rd zone. 25 in active fleet around 1928 [36]. 25 in fleet in 1941, 1951 & 1955, and in 1957 [49]. 25 locos in class still in fleet list in 1965 and 1968 [*EFE memorias anuales*].



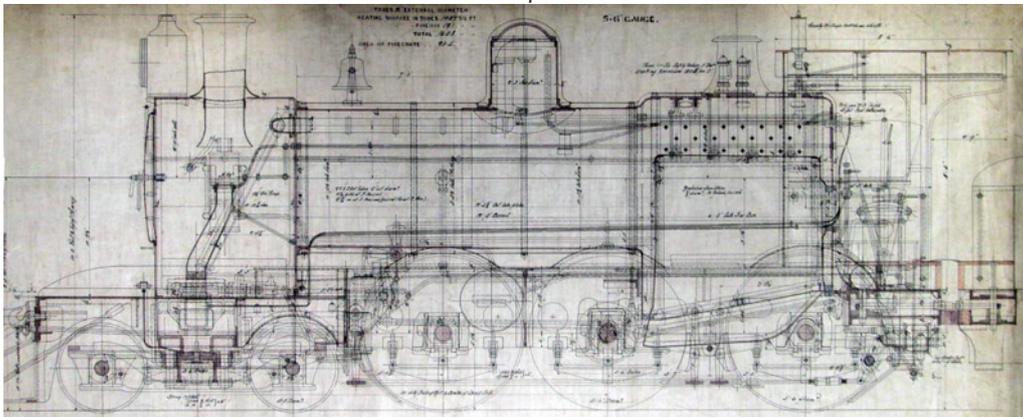
Published diagram found amongst P. C. Dewhurst archive in the NRM in York.



Image found in ETH Zurich archive.



No. 537 'FEDERICO STUVEN' seen in 1915, from Pablo Moraga's collection via the ARPF Concepción website.



549-553 were originally allotted to metre gauge stock, but at this point, a separate metre gauge list was formed and the locos were quickly renumbered out of this sequence.

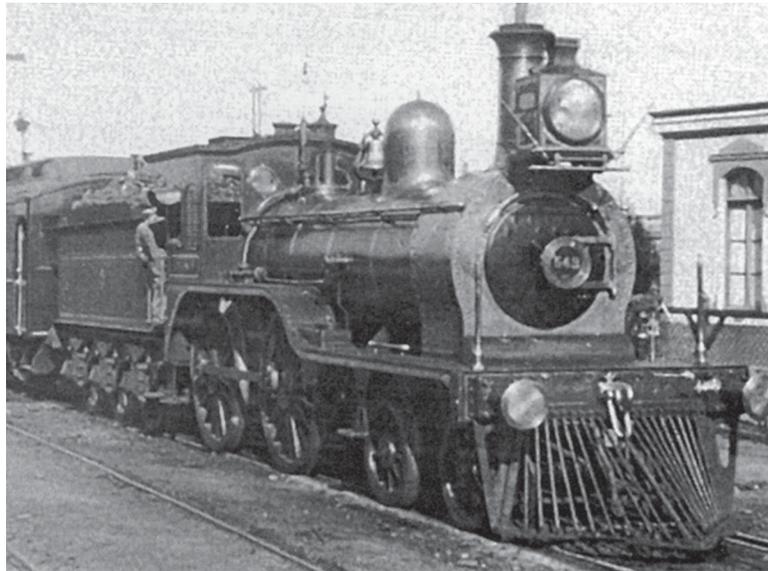
Tipo 6?

4-4-0 d/w ?, cyls. ?x?, built at the EFE's own Valparaiso workshops around 1910 [1]

This loco was supposedly 'similar to no. 16'. This last comment is a puzzle, for the only no. 16 known was an FCSV 4-4-0 from 1856, which is unlikely to have been copied 54 years later. Possibly rebuilt from some unknown loco. [50] surmises that it was rebuilt as a demonstration of Chilean technical and industrial progress in the 100 years since independence.

549 'CENTENARIO'

Source [30] lists this loco along with other *tipo 6* engines. Loco with this number 549 'excluidas' in 1930 [3]. Loco with this number sold to Braden Copper Co. presumably for scrap in 1931 [3].



Tipo 34

(1st & only batch)

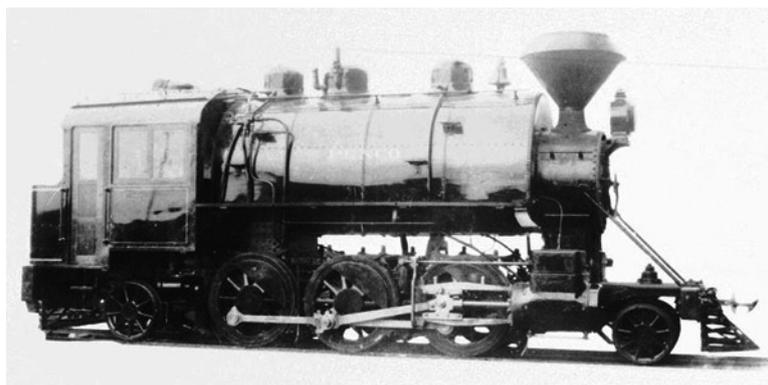
2-6-2ST d/w 1270mm 50", cyls. 406x609mm 16"x24", built by Lima in 1908

The Lima list and photo show these locos with the names 'PENCO' and 'CURANILAHUE'. The Lima erecting card shows that the order was for W. H. Crossman & Co. A Lima letter to P. C. Dewhurst in the 1920s confirmed that this was an agent who was acting for the *Cía Carbonífera de los Ríos de Curanilahue*. The locos had presumably been intended for use on the Concepción to Penco and Lirquen railway, which was owned by that company. However, they certainly seem to have been in the *EFE* fleet from 1908 or so, and in 1921 and at the dates mentioned below.

165² w/n 1066 Loco with this number 'excluídas' in 1930 [3]. Sold to *Dirección de Obras Marítimas* 1932.

170² w/n 1065 Listed under *Zona I* (MByC) in 1939, 1941 & 1942.

Two listed in post-1908 diagram book [24]. 2 in class in 1921, all in the *IV zona*. 2 in active fleet around 1928 [36]. 1 in active fleet in 1941 & 1942 [37]. None listed in 1951.



This builder's photo shows 'PENCO', with chopper couplings as used by the *FC de Arauco*.

Tipo 20 'Nacionales – pasajeros'

(1st batch +)

4-4-0 d/w 1676mm? 66"?, cyls. 445x609mm 17½"x24"?, built by SMyG in 1909

Note they only entered into service in 1912. Ordered under decree 934 of 27-5-1909.

91² Into service Jan-Oct 12 [9]. Listed under *Zona III* (MC) in 1939, 1942, & 1951.

105² Into service Jan-Oct 12 [9]. Listed under *Zona III* (MC) in 1939, 1942, 1951 & 1955.

42 in active fleet around 1928 [36]. 40 in active fleet in 1942 [37]. 6 in active fleet in 1958 but none left in 1968 [49].

Tipo 20 'Nacionales – pasajeros'

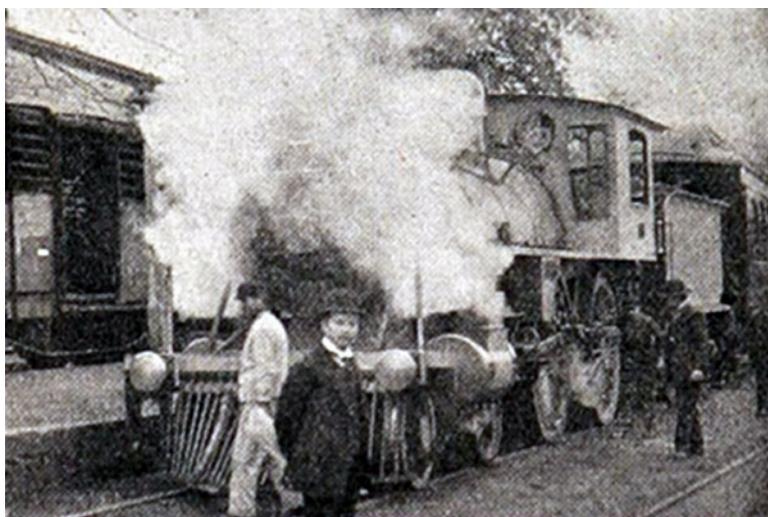
(2nd batch+)

4-4-0 d/w 1676mm 66", cyls. 445x609mm 17½"x24", built by Balfour Lyon in 1909

Note they only entered into service in 1912. These locos ordered by decree 934 of 27-5-1909, seemingly in three batches: **292-297**, **133** and **298-301**.

- 133**² Into service Jan-Oct 12 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 292** Payment to Balfour Lyon for this loco authorised in April 1911 [*El Mercurio* 4th April 1911]. Listed under *Zona III*(MC) in 1939, 1941, 1942 & 1951.
- 293** Payment to Balfour Lyon for this loco authorised in April 1911 [*El Mercurio* 23rd April 1911]. Loco with this number **293** 'excluidas' in 1930. 'Desarmada 1933' [3].
- 294** Loco no. **294** sold to the *FC y Balneario de Quintero* in 1929 [3] or possibly just leased as it returned to the *EFE* in 1937. Not listed in 1942 [37]. In one list under *Zona III* (MC) in 1951, and also listed there in 1955.
- 295** Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951.
- 296** Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951.
- 297** Listed under *Zona III* (MC) in 1939, 1941 & 1942 & 1951, then under *Zona II* (MSE) in 1955. Seen at Rancagua station in 1940s (or possibly 1960s?).
- 298** Into service April-June 12 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951, but by *Zona I* (MB) in 1955..
- 299** Into service April-June 12 [9]. Listed under *Zona II* (MSE) in 1939 and 1941, and under *Zona III* (MC) in 1942, 1951 & 1955.
- 300** Into service April-June 12 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 301** Into service April-June 12 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951. Not listed anywhere in 1955.

42 in active fleet around 1928 [36]. 40 in active fleet in 1941, 1942 & 1951. 6 in active fleet in 1958 but none left in 1968 [49].



A Balfour Lyon *tipo 20* under test in early 1911 whilst still presumably in works grey paint. Photo from *Sucesos 453*.

Tipo 29

0-6-2T *d/w 1118mm 44", cyls. 381x609mm 15"x24", built by Baldwin in 1902*

See note above explaining how these locos had been diverted to the *DOP* on delivery in 1902.

117² w/n 20211 Ex *DOP* no. **117**.

118² w/n 20212 Ex *DOP* no. **118**

119² w/n 20213 Ex *DOP* no. **119**.

These locos are a puzzle. They must have returned to the *EFE* as stated here, but source 16 suggests a pair of them may have spent time on the Coquimbo railway, then returning to the *EFE* after 1916 to be classed as *tipo* 68 nos. **644-645**. Just one, **117**, listed in post-1908 diagram book [24], which may fit with the other two having gone to Coquimbo.

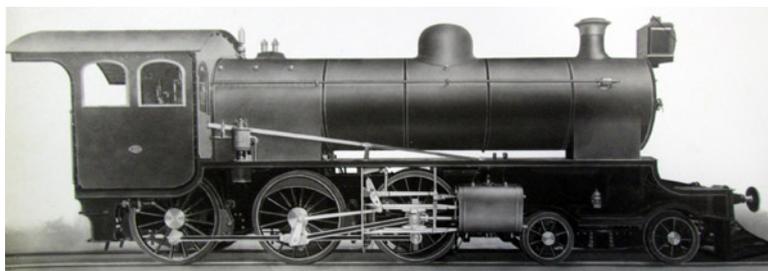
Tipo 59

4-6-0 *d/w 1546mm 61", cyls. 350/550x650mm 13¾"/21½x25½", built by Borsig in 1910*

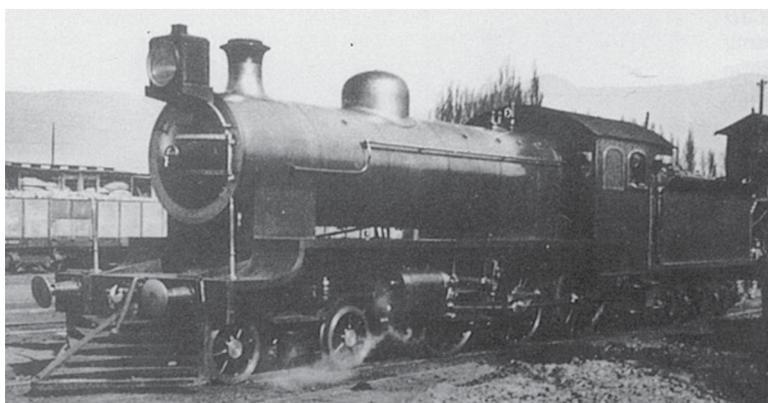
(1st & only loco)

18² w/n 7389 Ex-BA Exhibition. Originally thought to have been donated by Argentine Govt. to celebrate 100th anniversary of Chilean independence on 18 September. Delivered to *EFE* 11/05/11. However, more likely to have been bought by the *EFE* from the exhibition. Borsig catalogue suggests this was originally to have been numbered **549** (which was the next vacant number at the time), but probably never actually ran with that number [50]. Into service June 11 [9], and possibly obtained by Decree of *MIOP* No. 393 of 25-IV-1911 via Schumacher & Wolff. Listed under *Zona III (MC)* in 1939, 1941, 1951 & 1955. Seen at MSB in 1974 [10] and on display there in 1975 [49]. Preserved at Parque Quinta Normal in Santiago.

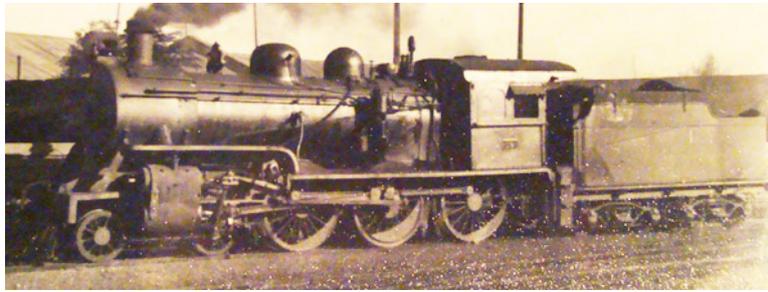
1 loco in active fleet around 1928 [36]. 1 in fleet in 1941 & 1951, and in 1957 [49]. 1 loco in class still in fleet list in 1965 and 1968 [*EFE memorias anuales*].



An artistically modified image prepared for a Borsig catalogue.



No. **18** as built. Note the Argentine style wooden cowcatcher.



Heavily rebuilt as a simple.

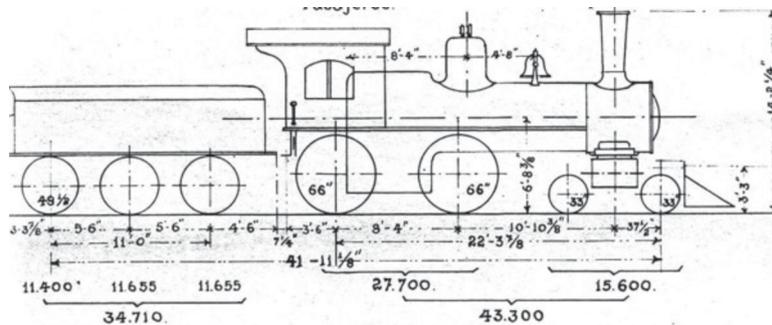
Tipo 20 'Nacionales – pasajeros' (3rd batch+)
4-4-0 d/w 1676mm 66", cyls. 445x609mm 16"x24", built by Balfour Lyon in 1910 (83 & 291),
and Lever Murphy/SMiG in 1911 (302 onward)

[1] states that Lever Murphy/Caleta Abarca contracted to build 12 locos per year from this time onward, and Balfour Lyon to build 6 locos per year. Locomotives up to no. **339** ordered by decree 934 of 27-5-1909. Locomotives **340-341** ordered under decree 934 of 27-5-1909.

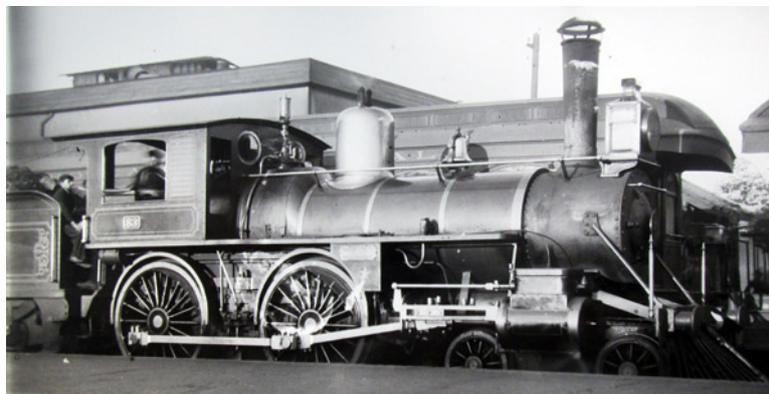
- 83²** Into service December 10 [9]. Listed under *Zona II* (MSE) in 1939 and 1941, and under *Zona III* (MC) in 1942. Back under *Zona II* (MSE) in 1951.
- 291²** Into service December 10 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 302** Into service December 10 [9]. Listed under *Zona III* (MC) in , 1941, 1942, 1951 & 1955.
- 303** Into service Jan-Dec 11 [9]. Listed under *Zona II* (MSE) in 1939, 1941, 1942, 1951 & 1955.
- 304** Into service Jan-Dec 11 [9]. Listed under *Zona II* (MSE) in 1939, 1941, 1942 & 1951.
- 305** Into service Jan-Dec 11 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 306** Into service Jan-Dec 11 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. Seen preserved at MSB in 1974 [10] and 1977 [Raymond Marsh]. Preserved at Parque Quinta Normal in Santiago.
- 307** Into service Jan-Dec 11 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 308** Into service Jan-Dec 11 [9]. Listed under *Zona II* (MSE) in 1939, 1941, 1942, 1951 & 1955.
- 309** Into service Jan-Dec 11 [9]. Listed under *Zona II* (MSE) in 1939, 1941, 1942, 1951 & 1955.
- 310** Payment to SMiG for this loco authorised in April 1911 [*El Mercurio* 21st April 1911]. Into service Jan-Dec 11 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 311** Payment to SMiG for this loco authorised in April 1911 [*El Mercurio* 21st April 1911]. Into service Jan-Dec 11 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951.
- 312** Payment to SMiG for this loco authorised in April 1911 [*El Mercurio* 27th April 1911]. Into service Jan-Dec 11 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 313** Into service Jan-Dec 11 [9]. Listed under *Zona III* (MC) in 1939,

- 1941, 1942, 1951 & 1955.
- 314 Into service Jan-Dec 11 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951.
- 315 Into service Jan-Dec 11 [9]. Listed under *Zona II* (MSE) in 1939, 1941, 1942 & 1951.
- 338 Into service Jan-Dec 11 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 339 Into service Jan-Dec 11 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951.
- 340 Into service Jan-Oct 12 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951.
- 341 Into service Jan-Oct 12 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942 & 1951.

First eight of these listed in post-1908 *EFE* diagram book [24]. 42 in active fleet around 1928 [36]. 40 in active fleet in 1941 and 1942. 6 in active fleet in 1958 but none left in 1968 [49].



Sketch is from post-1908 *EFE* diagram book, in the SLS library file LD1896.



Tipo 20 no. **83**. Photo from P. C. Dewhurst archive from around the time of the First World War.

Tipo 20 ‘Nacionales – pasajeros’ *(4th & last batch)*
4-4-0 d/w 1676mm 66", cyls. 445x609mm 16" x24", built by SMG in 1912?

Ordered under Decree 934 of 27-5-1909.

- 383 Into service Jan-Oct 12 [9]. Listed under *Zona II* (MSE) in 1939, 1941 & 1942. Dismantled 1947 [1951 *EFE* blue-print loco list].
- 384 Into service Jan-Oct 12 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955.
- 385 Into service Jan-Oct 12 [9]. Listed under *Zona II* (MSE) in 1939, 1941, 1942, 1951 & 1955.
- 386 Into service Jan-Oct 12 [9]. Involved in fatal accident between Caracol and Chacayal in 1923 [report in ArNAd MFER197].

- 387 Listed under *Zona* II (MSE) in 1939, 1941, 1942 & 1951.
Into service Jan-Oct 12 [9]. Listed under *Zona* III (MC) in 1939, 1941, 1942, 1951 & 1955.
- 422 Into service Jan-Oct 12 [9]. Tender bogie caught fire at Parral station on evening of 25 March 1916 whilst hauling the ordinario from Talcahuano to Santiago [42]. Listed under *Zona* III (MC) in 1939, 1941 & 1942, but under *Zona* I (MByC) in 1951 & 1955.
- 423 Into service Jan-Oct 12 [9]. Listed under *Zona* III (MC) in 1939, 1941 & 1942, but under *Zona* I (MByC) in 1951.
- 424 Into service Jan-Oct 12 [9]. Listed under *Zona* III (MC) in 1939, 1941, 1942, 1951 & 1955.
- 425 Into service Jan-Oct 12 [9]. Listed under *Zona* III (MC) in 1939, 1941, 1942 & 1951.

42 in active fleet around 1928 [36]. 40 in active fleet in 1941, 1942 [37] and 1951. 6 in active fleet in 1958 but none left in 1968 [49].

Tipo 58 (2nd & last batch)
4-6-0 d/w 1676mm 66", cyls. 483x660mm 19" x26", built by Hanomag in 1912

Tenders for the construction of ten passenger locos (probably these) and twenty goods locos (almost certainly *tipo* 57s nos. **560-579**) were presented by the following builders or agents in December 1911: Hanomag, Henschel, NBL, Schwartzkopff, Borsig, Grace (presumably representing a US builder), Ste. Metalurgique, Maffei, Esslingen, Hohenzollern, Kitson, Jung, VF, and La Meuse. The lowest tenders were indeed Hanomag for the passenger locos and Henschel for the goods engines. Like the *tipo* 57 2-6-0s, this class were all rebuilt with superheating, 'bolt-on' piston valve chests, and outside steampipes during the 1920s. A very few, both of this class and of *tipo* 57, were further rebuilt with integral piston valve chests within the cylinder blocks. This would have greatly reduced the clearance volume and thus the steam consumption but was only applied to a few locomotives. Nos. **539**, **554** and **555** received these integral cylinders and valve chests..

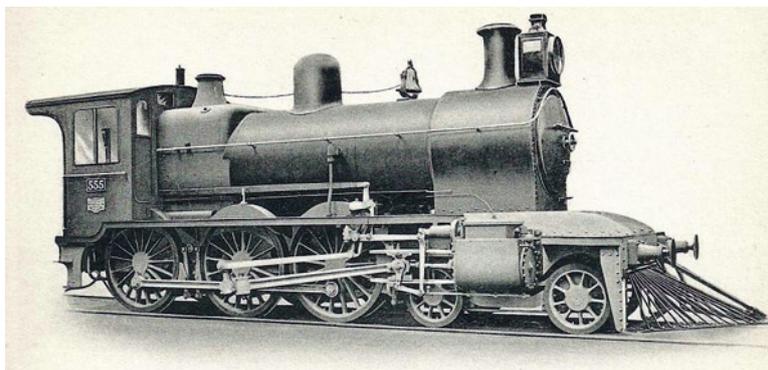
- 550** w/n 6602 Into service Nov-Dec 12 [9]. Listed under *Zona* II (MSE) in 1939, 1941, 1951 & 1955. Seen in steam at General Lopez in 1976 [35], and at Temuco in 1977 [Raymond March].
- 551** w/n 6603 Into service Nov-Dec 12 [9]. Listed under *Zona* II (MSE) in 1939, 1941, 1951 & 1955. Seen in steam at Temuco in Dec.(?) 1969 [Ken Mills] and 1972 [Ron Ziel].
- 552** w/n 6604 Into service Nov-Dec 12 [9]. Listed under *Zona* III (MC) in 1939, 1941, & 1955. **1951 allocation?**
- 553** w/n 6605 Into service Nov-Dec 12 [9]. Listed under *Zona* II (MSE) in 1939, 1941, 1951 & 1955. Seen at Valdivia 1977 [21].
- 554** w/n 6606 Into service Nov-Dec 12 [9]. Listed under *Zona* II (MSE) in 1939 & 1941. Came out of MSB in October 1940 with new piston valve cylinders and raised running board. One list suggests under *Zona* III (MC) in 1951, and was solely listed as there in 1955.
- 555** w/n 6607 Into service Nov-Dec 12 [9]. Listed under *Zona* II (MSE) in 1939, 1941, 1951 & 1955. Seen at Temuco in 1974 [10]. Also fitted with integral piston valve cylinders.
- 556** w/n 6608 Into service Nov-Dec 12 [9]. Listed under *Zona* II (MSE) in 1939, 1941, 1951 & 1955. Seen at Valdivia in 1972 [20]. seen on Villarica branch in 1977 [Günter Haslbeck], and on Tolten line in 1978.
- 557** w/n 6609 Into service Nov-Dec 12 [9]. Listed under *Zona* II (MSE) in 1939,

1941, 1951 & 1955. Seen working on Villarica branch in 1972 [Ian Dunn photo].

558 w/n 6610 Into service Nov-Dec 12 [9]. Pictured in Temuco roundhouse photo in 1932. Listed under Zona II (MSE) in 1939 & 1941. One list suggests under Zona III (MC) in 1951, and solely listed there in 1955.

559 w/n 6611 Into service Nov-Dec 12 [9]. Listed under Zona II (MSE) in 1939, 1941, 1951 & 1955. Seen at Valdivia in 1972 [20].

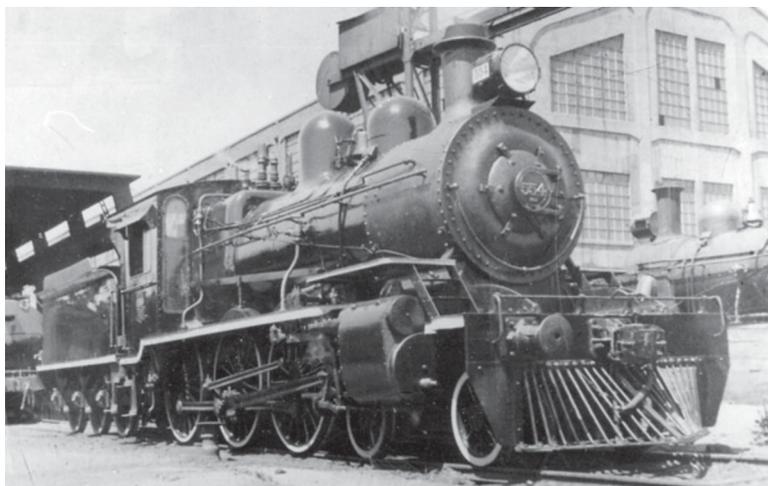
25 in active fleet around 1928 [36]. 25 in fleet in 1941, 1951 & 1955, and in 1957 [49]. 25 locos in class still in fleet list in 1965 and 1968 [*EFE memorias anuales*].



Hanomag publicity card picture.



Tipo 58 front ends at Temuco roundhouse in 1932. Both have been rebuilt with outside steampipes, but **534** on the right carries a feedwater heater above the smokebox whilst **558** on the left is more typical of the class as a whole.



No. **554** as rebuilt at MSB October 1940 with new piston valve cylinders and raised running board. Also note single buffer permitting safe coupling to vehicles not yet

bearing knuckle couplers.

Tipo 57 'North British de carga'

(2nd batch +)

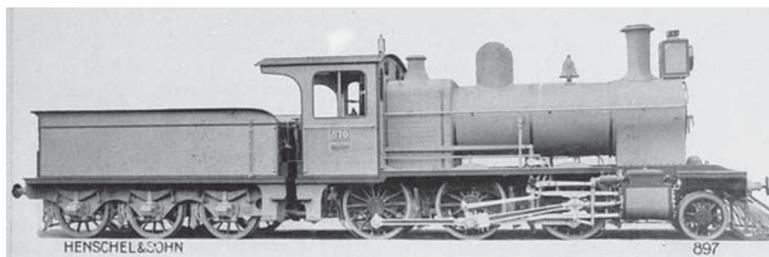
2-6-0 d/w 1422mm 56", cyls. 457x660mm 18" x26", built by Henschel in 1912

560	w/n 11290	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in steam at Cajon in 1976 [35].
561	w/n 11291	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in steam at Temuco in 1976 [35].
562	w/n 11292	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955.
563	w/n 11293	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in steam by AED March 1977.
564	w/n 11294	Into service Aug-Sept 12 [9]. Supervised by San Eugenio 1939, 1941, 1942, 1951 & 1955.
565	w/n 11295	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Supposedly one of the last engines on the Lebu to Los Sauces line. Survives at Victoria.
566	w/n 11296	Into service Aug-Sept 12 [9]. Listed under Zona II (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen in steam at Renaico in Dec. 1968 [35] and on Villarrica branch in 1974. In steam at Temuco 1977 [John West].
567	w/n 11297	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955.
568	w/n 11298	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955.
569	w/n 11299	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Attached to a bogie tender for a while [ITN].
570	w/n 11300	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in service at Temuco in 1974.
571	w/n 11301	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Temuco in 1976 and '77 [CRJ].
572	w/n 11302	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Valdivia 1977 [21].
573	w/n 11303	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Lonquimay in early 1970s. Seen at Valdivia 1977 [21].
574	w/n 11304	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Renaico & Los Sauces in 1974 [10]. Also seen in steam passing through Temuco in 1974. Late in its career was allocated to Lebu and equipped with a bogie tender to facilitate running backwards on poor track [31].
575	w/n 11305	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Valdivia 1977 [21].
576	w/n 11306	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. According to ITN, the last <i>tipo 57</i> in revenue-earning service. Preserved in Temuco Railway Museum.
577	w/n 11307	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939,

1941, 1942, 1951 & 1955. Seen at Antilhue in 1974, Valdivia 1977 [21], Villarica branch 1980, and on Lonquimay line in 1982 [Günter Haslbeck]. Also supposed to have been a regular on the Carahue branch in the final years. Attached to a bogie tender for a while [ITN]. Hired as stationary boiler to factory in Concepción in 1986 [ITN]. Survives at Carahue.

578	w/n 11308	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, & 1942, 1951 & 1955. Seen at Antilhue in 1974 when photographed by Tommy Farr [10]. Seen in steam at Temuco in 1976 and 1978. Also fitted with integral piston valve cylinders.
579	w/n 11309	Into service Aug-Sept 12 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Valdivia 1977 [21].
580	w/n 11739	580 to 585 were originally to have been delivered to the new Osorno to Puerto Montt section, but whether this actually occurred is uncertain [5]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. In steam at Temuco in 1972 [Ron Ziel]. Seen at Valdivia 1977 [21].
581	w/n 11740	Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in steam on Lebu line in 11-1962 [pic by Sr. F. Gonzalez].
582	w/n 11741	Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955.
583	w/n 11742	Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. At Valdivia 1977 [21].
584	w/n 11743	Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955.
585	w/n 11744	Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Temuco in Dec(?) 1969 [Ken Mills]. Seen in steam at San Bernardo in 1972 [ERS], and at Cajon in 1976 [35].

113 in active fleet around 1928 [36]. 114 in active fleet in 1941 & 1942 [37]. 112 in active fleet in 1951 & 1955, and in 1957 [49]. 111 locos in class still in fleet list in 1965, and 112 in 1968 [EFE memorias anuales]. Around 100 left in 1979 though not all in use [49].



Henschel catalogue image, Jens Schindler collection.

Tipo 57A

(1st & only batch)

2-6-0 d/w 1372mm 54", cyls. 457x609mm 18"x24", built by Hawthorn Leslie in 1912

Offered to EFE in January 1916 at a price of £3,190 each [42], owing to parlous financial situation of the Chilian Eastern Central Railway Co.

586	w/n 2901	ex <i>FC Lebu a Los Sauces</i> no. 5 . Listed under Zona III (MC) in 1941, 1951 & 1955.
587	w/n 2902	ex <i>FC Lebu a Los Sauces</i> no. 6 . Listed under Zona III (MC) in 1941. Sold 1950 to the <i>Cía. Carbonifera de Lota</i> [acc. to a 1951 blue-print EFE list].

Both ex *FC Lebu a Los Sauces*. Then to *DOP* and in use on Selva Oscura to Curacautín construction as Nos. **5 & 6** ac-

cordingly to Copeland. Later came to *EFE* fleet. Both in fleet in 1941 [37]. 1 loco in fleet in 1951 & 1955, and in 1957 [49]. 1 loco still in fleet list in 1965 but 0 in 1968 [*EFE memorias anuales*].

Tipo 60, or 61 if super-heated; eventually all became tipo 61 (1st & only batch)
4-6-0 d/w 1676mm 66", cyls. 508x660mm 20"x26", built by Baldwin in 1913

BLW class 10-34D nos. 1081-86 and 1087-90. BLW specs. in vol. 44 p200 and p205. Fitted with Schmidt patent piston valves. Second batch were fitted with Schmidt superheaters. Spec. sheets have hand-written annotations saying that hereafter the smokebox doors should be of a larger diameter. Builder's photo suggests supplied with six-wheeled tenders. Locomotives very un-American in appearance. Comment by ex-footplateman Victor Neftali Rivera Urra was "Como Fogonero de Locomotoras a Vapor diria que la Locs tipo 61 en especial la 590-591-592 -596 dotacion Casa de Maquinas Temuco fueron Locs muy veloces para trenes cortos de Ferrocarriles. El Ramal de Villarrica, Cunco, Carahue contaban con esas Locs. No consumian mucho Carbon y generaban Vapor muy rapidamente. No costaba mucho botarle el fuego al fogon y hacerle cambio. Inclusive habia un Fogonero Ruperto Vergarra Garreton del Ramal de Carahue que nunca pedia cambio de fuego, hacia las dos cueltas a Carahue con el mismo fuego. Como fueron Locs altas uno se sentia muy bien trabajando los Inyectores. Tampoco habia que correrle el Carbon porque su Carbonera era amplia."

588	w/n 39687	Into service July-Aug 13 [9]. Supplied with saturated boiler. Listed under Zona III (MC) in 1939, 1941, 1951 & 1955. BLW spec card suggests this may have been 39487.
589	w/n 39746	Into service July-Aug 13 [9]. Supplied with saturated boiler. Listed under Zona III (MC) in 1939, 1941, 1951 & 1955.
590	w/n 39750	Into service July-Aug 13 [9]. Supplied with saturated boiler. Listed under Zona III (MC) in 1939, 1941, 1951 & 1955.
591	w/n 39751	Into service July-Aug 13 [9]. Supplied with saturated boiler. Listed under Zona III (MC) in 1939, 1941, 1951 & 1955.
592	w/n 39752	Into service July-Aug 13 [9]. Supplied with saturated boiler. Listed under Zona III (MC) in 1939, 1941, 1951 & 1955.
593	w/n 39753	Into service July-Aug 13 [9]. Supplied with saturated boiler. Listed under Zona III (MC) in 1939, 1941, 1951 & 1955.
594	w/n 39754	Into service July-Aug 13 [9] with superheater. Listed under Zona III (MC) in 1939, 1941, 1951 & 1955.
595	w/n 39755	Into service July-Aug 13 [9] with superheater. Pictured in Temuco roundhouse photo in 1932. Listed under Zona III (MC) in 1939, 1941, 1951 & 1955.
596	w/n 39756	Into service July-Aug 13 [9] with superheater. Listed under Zona III (MC) in 1939, 1941, 1951 & 1955.
597	w/n 39757	Into service July-Aug 13 [9] with superheater. Listed under Zona III (MC) in 1939, 1941, 1951 & 1955. At Osorno in 1972 [20].

10 in class in 1921, 7 in the 1st zone, 3 in the 2nd zone. 10 locos in active fleet around 1928 [36]. 10 in fleet in 1941, 1951 & 1955, and in 1957 [49]. 10 locos in class still in fleet list in 1965 and 1968 [*EFE memorias anuales*].



BLW pic of **588** from Penn. RR Museum collection.

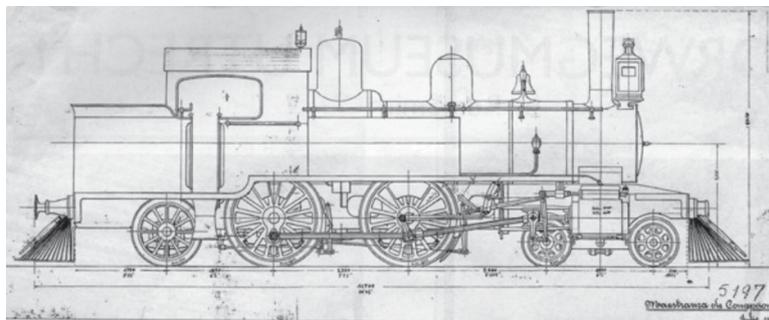


Photo shows no. **589** at Temuco during the *Fiesta Patrias* in 1966. Alterations from the above pic seem to include the running plate, sand-dome, external steam pipes.

Locos never built

NBL records held in Glasgow suggest that around 1913 the company had prepared drawings in readiness for tendering for several types of loco for *EFE* broad gauge lines around 1913. These included 2-8-0s with either narrow or wide fireboxes, 4-6-0 passenger engines, and most surprisingly of all – 2-10-4Ts. This is clearly not a misprint as the wheel arrangement appears at least three times in the list of drawings.

Ian Thomson N. also suggests [45] that the *EFE maestranza* in Concepcion drew up drawings at that time for a branch line 4-4-2T based on the *tipo 20* 4-4-0s.



Sketch by Maestranza Concepción 1913, via Ian Thomson and *Locomotives International* issue 111.

Tipo 57 'North British de carga'

(3rd batch +)

2-6-0 d/w 1422mm 56", cyls. 457x660mm 18"x26", built by SMG from 1913 onwards

Locos **426-431** ordered by Decree 934 of 27-5-1909.

- | | |
|------------|---|
| 426 | Into service Feb-Nov 13 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. |
| 427 | Into service Feb-Nov 13 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32]. |
| 428 | Into service Feb-Nov 13 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. |
| 429 | Into service Feb-Nov 13 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen on Lonquimay branch in 1982 [ERS]. Seen at Curacautín in April 1992 [ITN]. Preserved in Temuco Railway Museum. |

- 430** Into service Feb-Nov 13 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Concepción in 1971-2 [32].
- 431** Into service Feb-Nov 13 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
- 598** Into service Feb-Nov 13 [9]. Pictured in Temuco roundhouse photo in 1932. Listed under Zona III (MC) in 1939, 1941 1942, 1951 & 1955. Seen at Valdivia 1977 [21].
- 599** Into service Feb-Nov 13 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Valdivia 1977 [21]. Stood derelict/preserved in Valdivia station in 1990s. Preserved at Colchagua Museum.
- 600** Into service Feb-Nov 13 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in steam at Valdivia in 1975 [ITN] and 1976 [35].
- 601** Into service Feb-Nov 13 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen at Valdivia 1973 [ERS].
- 602** Into service Feb-Nov 13 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in steam at Temuco 1977 [John B. West] in the red lead economy livery.
- 603** Into service Feb-Nov 13 [9]. Seems to have been rebuilt with integral piston valve cylinder blocks, possibly around 1940, in much the same way as *tipo 58* nos. **554** and **555** (see above). The resulting loco had a raised section of running plate, just as **554** did. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen on shed at Valdivia in 1968[35] and on a Valdivia train at Antihue in 1970 [Mauricio Lemoine]. Seen at Valdivia in 1972 [20] and 1977 [?]. At Antihue in 1974 []. Seen running on Villarica branch in 1980/1 [Geoff Hall].



Pic of no. **603** posted on *Tren Chile* Facebook page by Mauricio Lemoine.

Note the integral piston valve block, rather than the bolt-on valve chest of the rest of the class, the raised section of fooplate, and the lack of outside steam pipes.

- 604** Into service Dec 13-Jan 14 [9]. Listed under Zona III (MC) in 1939,

- 1941, 1942, 1951 & 1955. At Valdivia 1977 [21].
- 605** Into service Dec 13-Jan 14 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955.
- 606** Into service Dec 13-Jan 14 [9]. Loco with this number engaged in electrification works duties in 1931 [3]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen on shed at Valdivia in 1968 [35]. At Valdivia in Dec. (?) 1969 [Ken Mills] and 1972 [20]. At Osorno 1976, and 1977 [21]. Stated by one source to have been allocated to Lebu for a while late in its life. Plinthed on seafront in Pto. Montt.
- 607** Into service Dec 13-Jan 14 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. At Osorno in 1972 [20], Jan. 1975 [ITN] and 1977 [21]. Painted a coffee colour by MSB around 1977-8 owing to a shortage of black paint [ITN]. Survives at San Fernando. Was displayed at the Estación Central in Santiago for the Día del Patrimonio Cultural in 2018, seemingly in steam.
- 608** Into service Dec 13-Jan 14 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. At Osorno 1977 [21].
- 609** Into service Dec 13-Jan 14 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in steam at Antilhue in 1950. At Valdivia in 1972 [20]. At Osorno 1977 [21].
- For locos 610-616, see Tipos 62 & 63 below.*
- 617** Into service June 15-Nov 17 [9]. [42] confirms accepted into service by July 1915 and payment to builder can be made. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. At Osorno in 1968 (DTR), 1974 [10], 1976, and 1977 [21].
- 618** Into service June 15-Nov 17 [9]. [42] confirms accepted into service by July 1915 and payment to builder can be made. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955.
- 619** Into service June 15-Nov 17 [9]. [42] confirms accepted into service in October 1915 and payment can be made. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955.
- 620** Into service June 15-Nov 17 [9]. [42] confirms accepted into service in October 1915 and payment can be made. Pictured in Temuco roundhouse photo in 1932. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. At Osorno in 1972 [20] and 1977 [21], seen at Curacautín in 1981, and 1982 [ERS]. Operates out of Valdivia.
- 621** Into service June 15-Nov 17 [9]. [42] confirms accepted into service in October 1915 and payment can be made. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. At Osorno in 1972 [20] and 1977 [21], and on Lonquimay branch in 1978 [ERS]. In steam at Victoria in 1981.
- 622** Into service June 15-Nov 17 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Seen on shed at Pto. Montt in 1968 [35]. At Osorno 1977 [21].

113 in active fleet around 1928 [36]. 114 in active fleet in 1941 & 1942 [37]. 112 in active fleet in 1951 & 1955, and in 1957 [49]. 111 locos in class still in fleet list in 1965, and 112 in 1968 [EFE memorias anuales]. Around 100 left

in 1979 though not all in use [49].

Braden Copper buys old locos for scrap

Particularly during the 1920s and 1930s the annual *EFE memorias* often list the purchaser of withdrawn steam locomotives as the Braden Copper Company. This might puzzle some readers. However, a basic understanding of one of the stages of copper smelting reveals the answer, for $\text{Fe(s)} + \text{CuSO}_4(\text{aq}) = \text{FeSO}_4(\text{aq}) + \text{Cu(s)}$ In other words adding scrap iron or steel to copper sulphate gives you metallic copper. A substantial uphill traffic on the Braden Copper railway from Rancagua up to El Teniente was indeed scrap metal, heading no doubt to Caletones where the copper ore was processed.

Tipo 57 'North British de carga'

(4th batch +)

2-6-0 d/w 1422mm 56", cyls. 457x660mm 18"x26", built by Balfour Lyon or SMG in 1914

See notes for each loco for actual builder.

3²	Balfour Lyon	Into service 1914 [9]. Listed under Zona III (MC) in 1939, 1941 and 1942, & under Zona II (MSE) in 1951 & 1955. Seen at Osorno in 1974 [ERS].
11²	Balfour Lyon	Into service 1914 [9]. Listed under Zona III (MC) in 1939, 1941 and 1942, & by San Eugenio in 1951 & 1955.
12²	Balfour Lyon	Into service 1914 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955.
13²	Balfour Lyon	Into service 1914 [9]. Listed under Zona II (MSE) in 1939, 1941, 1942, 1951 & 1955. Seems to have worked later in the Concepción area. Survives at Penco.
22²	Balfour Lyon	Into service 1914 [9]. Listed under Zona II (MSE) in 1939, 1941, 1942, 1951 & 1955. Seen in steam at Concepción in 1977 [Raymond Marsh].
267²	SMG	Into service Dec 13-Jan 14 [9]. Listed under Zona II (MSE) in 1939, 1941 & 1942, and under Zona III (MC) in 1951 & 1955. Seen at Los Sauces in 1974 [10].
268²	SMG	Into service Dec 13-Jan 14 [9]. Listed under Zona III (MC) in 1939, 1941, 1942 & 1951.
417	Balfour Lyon	Into service 1914 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955.
452	SMG	Into service Dec 13-Jan 14 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955. Photographed at Laraquete in 1979.
453	SMG	[42] contains notes 9 May-June 1915 re moneys owed owing to locos 453 and 454 not being ready for use in early 1915 as expected. Some of delay was attributed to difficulties obtaining parts owing to 'European War'. Into service June 15-Nov 17 [9]. Listed under Zona III (MC) in 1939, 1941, 1942 & 1951. At Valdivia in 1972 [20 and 32].
454	SMG	Into service June 15-Nov 17 [9]. Listed under Zona II (MSE) in 1939, 1941, 1942, 1951 & 1955.
455	SMG	Into service June 15-Nov 17 [9]. Listed under Zona III (MC) in 1939, 1941, 1942, 1951 & 1955.

113 in active fleet around 1928 [36]. 114 in active fleet in 1942 & 1942 [37]. 112 in active fleet in 1951 & 1955, and in 1957 [49]. 111 locos in class still in fleet list in 1965, and 112 in 1968 [*EFE memorias anuales*]. Around 100 left in 1979 though not all in use [49].

Tipo 62

(1st & only batch)

4-4-0 d/w 1422mm 56", cyls. 355x508mm 14"x20", built by Lima in 1908

Pedro Rosselot, and later his widow Doña Beatrice Aravena, was the contractor for the Osorno to Puerto Montt section of the southern mainline completed in 1913. These locos seem to have been purchased for that contract. Names were found in the Lima works list.

610	w/n 1075	Ex-Pedro Rosselot contractor no. 1 'QUEPE' . Into <i>EFE</i> service 1914 [9]. Sold to Braden Copper Co. in 1929 [3], presumably for scrap. <i>Number 610 possibly reused for a tipo 57 2-6-0 later. See below.</i>
611	w/n 1076	Ex-Pedro Rosselot contractor no. 2 'REMOLINOS' . Into <i>EFE</i> service 1914 [9]. Sold to Braden Copper Co. in 1929 [3], presumably for scrap.
612	w/n 1077	Ex-Pedro Rosselot contractor no. 3 'CHAHUILCO' . Into <i>EFE</i> service 1914 [9]. Sold to Braden Copper Co. in 1929 [3], presumably for scrap.
613	w/n 1078	Ex-Pedro Rosselot contractor no. 4 'LLANQUIHUE' . Into <i>EFE</i> service 1914 [9]. A loco 613 recorded as ' <i>detenidas</i> ' at MSB (withdrawn?) during 1923 [3]. Sold to Braden Copper Co. in 1929 [3], presumably for scrap.

Three listed in fleet but as 'obsolete or knocked down' around 1928 [36]. Whole class sold for scrap in 1929.

Tipo 63

(1st batch +)

4-4-0 d/w 1524mm 60", cyls. 381x609mm 15"x24", built by Lima in 1910

Pedro Rosselot, and later his widow Doña Beatrice Aravena, was the contractor for the Osorno to Puerto Montt section of the southern mainline completed in 1913. These locos seem to have been purchased for that contract. Names found in Lima works list. The fourth and final loco of this type became *EFE* **643**, see below.

614	w/n 1099	Ex-Pedro Rosselot contractor no. 5 'PRESIDENTE PEDRO MONTT'
615	w/n 1100	Ex-Pedro Rosselot contractor no. 6 'MINISTRO HEVÍA RIQUELEME' . Into <i>EFE</i> service 1914 [9]. To be withdrawn in 1921 [<i>EFE memoria</i> 1920 p323]
616	w/n 1101	Ex-Pedro Rosselot contractor no. 7 'VICENTE PERÉZ ROSALES' . Into <i>EFE</i> service 1914 [9]. Involved in fatal collision with loco 461 , between Afquintue and Loncoche, on 11th November 1916 [42].

Two listed in fleet but as 'obsolete or knocked down' around 1928 [36].

Wartime problems

Although Chile was not a belligerent in the First World War it was inevitably affected by difficulties in obtaining or shipping locos, parts and materials from Europe and the USA. In 1915 a response was received as follows to an enquiry: "*Balfour Lyon i Ca., contratistas para la construccion de 6 locomotoras anuales, segun escrituras de Junio de 1909, han formulado las siguientes ofertas en respuesta a una consulta que les hizo la Direccion, acerca de si podrían dar cumplimiento a lo estipulado: Que, no pudiendo entregar las 6 locomotoras correspondientes al período Junio 1914-1915, por impedirlo la situacion anormal del mercado en Europa, procurarán iniciar la construccion de las 6 locomotoras de carga tipo North British, correspondiente al período siguiente, Junio 1915-1916, para lo cual se han pedido precios a Estados Unidos de Norte América. Que en cambio de las 6 locomotoras de 1914-1915 podrían construir 10 coches de primera clase o reparar diversas locomotoras hasta la concurrencia del valor asignado a las 6 locomotoras, que es de \$ 306, 180, oro de 18d.*" "Balfour Lyon i Ca., contractors for the construction of 6

locomotives annually, according to the agreement of June 1909, have formulated the following offer in response to a query made by the Directorate, about whether they could comply with the stipulations: That, not being able to deliver the 6 locomotives corresponding to the period June 1914-1915, prevented by the abnormal market situation in Europe, they will try to start the construction of the 6 locomotives of type *North British de carga*, corresponding to the following period, June 1915-1916, for which they have asked for prices from the United States of North America. Instead of the 6 locomotives of 1914-1915 they could build 10 first class cars or repair various locomotives until the value reaches that assigned to the 6 locomotives, which is \$(pesos)306,180, of 18d gold.” [58]

Water treatment

Also in 1915 it was reported in the monthly *EFE boletín* that Dearborn water treatment would be tested in three locos in use on the San Antonio branch and one in the *I Zona*. [58]

The *maestranza* in Valdivia

A further report in the *EFE's boletín mensual* during 1915 indicates that the *IV Zona* workshops in Valdivia were at that time not cost-effective, with high expenses for a low through-put of work. The initial intention was to close them entirely and move everything to the *maestranza* in Concepción. However, it was recognised that this would cause a lot of hardship amongst the workers, and the decision was postponed, possibly to be enacted over a longer period. At the time there were 500 workers employed in the Valdivia workshops.

Tipo 57 'North British de carga' (5th batch +) 2-6-0 d/w 1422mm 56", cyls. 457x660mm 18"x26", built by Lever Murphy/SMiG in 1914-16

[42] says (6th June 1916) that none yet received. Discussion about the price of these locos in [42] during September and October 1916. Amongst other adjustments, steel tubes were to be fitted in place of bronze ones.

- 623** Into service 1916 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. Under repair at San Rosendo 1983, supposedly from use at Lebu, but work never completed? [Adán Garcés Gallardo].
- 624** Into service 1916 [9]. Loco with this number engaged in electrification works train duties in 1923 [3]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. At Osorno 1977 [21], and in Pto Montt 1977 [Raymond March]. In steam at Osorno in 1979.
- 625** Into service 1916 [9]. At Antilhue in 1974 [10]. Listed under *Zona III* (MC) in 1939, 1942, 1951 & 1955. In steam at Antilhue 1974. At Osorno 1977 [21, and Raymond Marsh] and 1978 [22].
- 626** Into service 1916 [9]. Listed under *Zona III* (MC) in 1939, 1942, 1951 & 1955. At Osorno 1973, 1975, 1976, and 1977 [21]. Seen in steam on Lago Ranco branch in 1976 [35].
- 627** Into service 1917 [9]. [42] explains received from SMG in December 1916, but missing a Michigan lubricator (not received from manufacturer) so accepted for testing with a used lubricator on loan from *Zona I*, temporarily. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. Photographed in steam at Pto. Varas in 1971. At Osorno 1976, & 1977 [21].
- 628** Into service 1917 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. Seen in steam at La Union in 1971 [ERS]. At Osorno in 1972 [20] and 1977 [21].
- 629** Into service 1917 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. At Osorno in 1972 [20] and 1977 [21].

- 630** Into service 1917 [9]. Listed under *Zona I* (MByC) in 1939, 1941, 1942, 1951 & 1955. Seen on San Perdo to Quintero line in 1968 [E. Rivera]. At Osorno 1977 [21]. Survives now in Valdivia (2018) but very derelict..
- 631** Into service 1917 [9]. Listed under *Zona I* (MByC) in 1939, 1941 & 1941, but under *Zona III* (MC) in 1942, 1951 & 1955. At Osorno in 1972 [20] and 1976. Preserved at Quinta Normal in Santiago.
- 632** Into service 1917[9]. Pictured in Temuco roundhouse photo in 1932. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. In steam at Puerto Montt 1971 [pic on Fotos Historicas de Chile FB page]. At Osorno 1977 [21].
- 633** Into service 1917 [9]. Listed under *Zona I* (MByC) in 1939, 1941, 1942, 1951 & 1955. But one list suggests under *Zona III* (MC) in 1951.
- 634** Into service 1917 [9]. Listed under *Zona III* (MC) in 1939, 1941, 1942, 1951 & 1955. At Osorno 1977 [21]. Survives at Victoria.
- 113 in active fleet around 1928 [36]. 114 in active fleet in 1941 & 1942 [37]. 112 in active fleet in 1951 & 1955, and in 1957 [49]. 111 locos in class still in fleet list in 1965, and 112 in 1968 [*EFE memorias anuales*]. Around 100 left in 1979 though not all in use [49].



No. **632**, on the left is one of these locally-built *tipo 57* engines still with a large smokebox door, presumably as built, whilst *tipo 58* no. **558** on the right has a US-style small smokebox door.

1915 depot loco numbers

The *EFE 'Boletín'* in December 1915 [42] states that Chillán loco depot had an allocation of 30 engines at that time, with Talca having 20, Curicó 12, and Yungai 10.

Tipo 64

(1st & only batch)

2-6-0 d/w 46", cyls. see below, built by Vulcan Iron Works in 1914

W/n 2296-2297 were built in May 1914 with cyls. 15"x20", and w/n 2307-2308 in July 1914, with cyls. 15"x24".

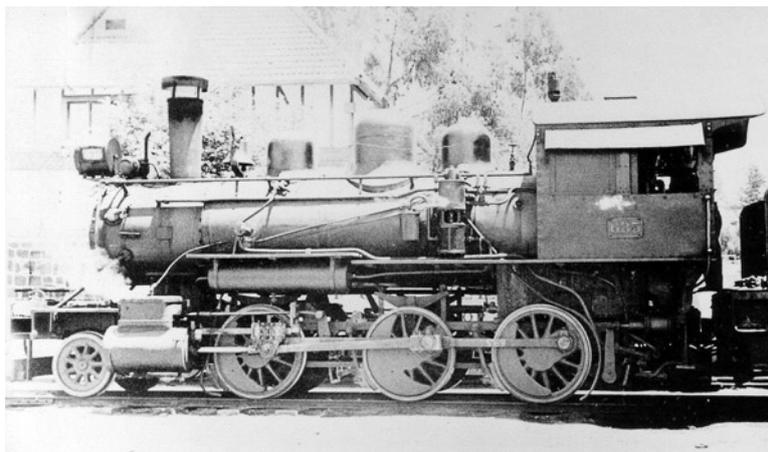
All were built for Germain & Sierra contractors (see below) as their **6 'LOUIS SERRANO', 7 'CARLOS SYMMES', 8 'GABRIEL QUIROS', 9 'ALEJANDRO GUZMAN'**. Details and source, though not builder, confirmed by [9] which says into *EFE* service 1918. [26] implies numbered by *EFE* in same order as built.

- 635** w/n ? Listed under *Zona I* (MByC) in 1939 & 1941, and under *Zona III* (MC) in 1951 & 1955.
- 636** w/n ? Listed under *Zona III* (MC) in 1939, 1941, 1951 & 1955.

637 w/n ? Listed under *Zona III* (MC) in 1939, 1941, 1951 & 1955.

638 w/n ? Listed under *Zona III* (MC) in 1939, 1941, 1951 & 1955.

Four listed in active fleet around 1928 [36]. 4 listed in 1941. 4 in fleet in 1941, 1951 & 1955, and in 1957 [49]. 1 loco still in fleet list in 1965 [*EFE memoria anual*], and in 1968 [49].



Tipo 67 (2nd & last batch)
0-4-0ST d/w 36", cyls. 11x16", built by Manning Wardle between 1889 and 1894

This was probably one of several Manning Wardle locos supplied via Woodgate Innes & Co. between 1889 and 1893-4. One or perhaps two MW 0-4-0STs worked on the Valdivia to Osorno railway contracts which started at that time. MW nos. 1266 and 1281 were supplied to Chile, but unlike all other MW locos for the country, the purchasers are unknown. If **638** was indeed one of these two, the basic dimensions would be d/w 36", cyls. 11"x16". See also no. **493**, above. See note above about no. **638** possibly having been used for ex Germain y Sierra VIW 2-6-0. The 1930 US Dept. of Commerce report by Rodney Long gives interesting data for this loco, including weights of 24.1T in total, 17.4T adhesive and 3.7T for the tender(?), driving wheels of 920mm (=36"), cyls. of 270mm x 380mm (10.5 x 15") and a grate area of 0.52m².

638 w/n ? w/n 1770? according to [26], but this is unlikely.

One listed in active fleet around 1928 [36], probably no. **493**. None listed in 1941 or 1951.

Tipo 66 (1st & only batch)
2-4-2ST d/w 937mm, cyls. 381x508mm 15"x20", built by Vulcan Iron Works in 6/1913

639 w/n 2187 Ex-Germain & Sierra contractors no. **4 'JAVIER EYZAGUIRRE'**, 'tank loco large' confirmed by [9] which says into *EFE* service 1918. Loco with this number '*excluidas*' in 1930 [3]. Loco with this number sold to Braden Copper Co. for scrap in 1931 [3].

One listed in fleet but as 'obsolete or knocked down' around 1928 [36]. None listed in 1941 or 1951.

Tipo 65 (1st & only batch)
0-4-2ST d/w 914mm 36", cyls. 305x406mm 12"x16", built by Vulcan Iron Works

These were probably w/n 1885-1886 built 1912, supplied to Germain & Sierra contractors as no. **1 'GONZALO URREJOLA'** and no. **2 'JUAN CASTELLAN'**; and w/n 2182 built 6/1912, to Germain & Sierra contractors as no. **3 'JUAN LUIS SANFUENTES'**.

640 'tank loco small' confirmed by [9] which says into service 1918. Loco with this number recorded as '*detenidas*' at *MSB* (withdrawn?) during 1923 [3].

641 'tank loco small' confirmed by [9] which says into service 1918.

642 'tank loco small' confirmed by [9] which says into service 1918.

One listed in fleet but as 'obsolete or knocked down' around 1928 [36]. None listed in 1941 or 1951.

Tipo 63

(2nd & last batch)

4-4-0 d/w 1524mm 60", cyls. 381x609mm 15"x24", by Lima, built 1910

See others from same source above.

- | | | |
|------------|----------|--|
| 643 | w/n 1102 | Ex P. Rosselot contractor no. 8 'MANUEL ANTONIO MATTA' .
See above. Into <i>EFE</i> service 1918 [9]. Sold to Braden Copper Co. in 1929 [3], presumably for scrap. |
|------------|----------|--|

Two listed in fleet but as 'obsolete or knocked down' around 1928 [36]. None listed in 1941 or 1951.

Tipo 68

(1st & only batch)

0-6-2T d/w 1143mm 45", cyls. 381x559mm 15"x22", built by Baldwin in ?

- | | | |
|------------|-------|---|
| 644 | w/n ? | Probably ex Coquimbo railway in 1916 when broad gauge ceased to operate [16]. Listed under <i>Zona I</i> (MByC) in 1939, 1941, 1951 & 1955. |
| 645 | w/n ? | Probably ex Coquimbo railway in 1916 when broad gauge ceased to operate [16]. Listed under <i>Zona I</i> (MByC) in 1939 & 1941 but under <i>Zona III</i> (MC) in 1951 & 1955. In steam at Concepcion in Dec. (?) 1969 [Ken Mills]. At MSB in 1974 [10]. |

644-5 were recorded in 1920 as belonging to *DOP* but possibly working for *EFE* [3]. 2 in use around 1928 [36]. 2 in fleet in 1941, and 1955, and in 1957 [49]. 2 locos in class still in fleet list in 1965, and 1 in 1968 [*EFE memorias anuales*].

Tipo 69

(1st & only batch)

2-8-0 d/w 48", cyls. 18"x24", built by Baldwin in 1902

[26] says Baldwin 19965-6, but Connelly's BLW list confirms w/n as below. See discussion above, year 1902 around p90. Supplied via Beeche i Cía. Into service June 1902 [9] for the steeply-graded Las Cardas section of the Coquimbo railway. The 1919 list of loco purchases for the preceding couple of decades [9] implies that these locos were ordered specifically for use in the north, rather than a move north being an after-thought. Builders' photo available at Penn. RR Museum (their photo no. 01540).

- | | | |
|------------|-----------|---|
| 646 | w/n 19956 | ex Coquimbo Railway no. 291 , in 1916 when broad gauge ceased to operate [16]. Listed under <i>Zona III</i> (MC) in 1939, 1941 & 1951. |
| 647 | w/n 19957 | ex Coquimbo Railway no. 292 , in 1916 when broad gauge ceased to operate [16]. Listed under <i>Zona III</i> (MC) in 1939, 1941 & 1951. |

2 in class in 1921, both in the *Zona III*. 2 in use around 1928 [36]. 2 in fleet in 1941 & 1951. 1 loco still in fleet list in 1965 [*EFE memoria anual*].

[16] says these were shipped south in 1916 when the Coquimbo broad gauge closed, but then became *tipo 69* nos.

646-7. It rather looks as though they had been purchased when all locos were being numbered in a single sequence, but having gone to Coquimbo they had then been forgotten about by the main broad gauge network (and their numbers reused), and thus had to receive new numbers when they came south in 1916.



Tipo 69 no. **647**. The replacement boiler has been mounted higher than the original,

probably because of a deeper firebox. The additional height of the smokebox above the saddle casting can be seen, also the shorter smokebox and round-topped firebox.

Tipo 70

(1st batch +)

2-8-2 d/w 1422mm 56", cyls. 560x711mm 22"x28", built by Montreal Loco Works in 1918

Confirmed by [9] which says first 20 into service 1919-20. There was discussion throughout 1918 about the delivery of these locos, expecting 10 to be ready late June and 10 in July. Of course shipment may have been difficult owing to the war, and shipping in nitrate ships had been suggested, perhaps at rate of two per month. Shipment from Montreal to New York for transshipment was considered, or even in a Japanese ship from Seattle. There was thought of sending them via a ship belonging to Sres. Germain y Sierra, and concern about the handling of these heavy part locomotives via *muelles* or lighters at Valparaiso or Talcahuano. In the end the first fifteen were to be shipped in the steamships *Maipo* and *Rancagua* of the *Soc. Comercial de Agricultores* [42, 1918 p1113] very late in the year.

No. 720 may have been assembled in Chile from spare parts, rather than being built like the others in Canada, though it seems to have a Montreal works number.

There were also bridges requiring reinforcement if these locos were to be permitted to run within the *I Zona*. Those named included Puentes Chacabuco, Lampa, La Finca, Quemado, Rabuco, Aranda and Paso Hondo.

701	w/n 59013	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
702	w/n 59014	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
703	w/n 59015	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
704	w/n 59016	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. In steam on Lonquimay line in 1978 (pic by Christian Slater). Seen on shed at Victoria in 1981.
705	w/n 59017	Supervised by Concepción 1939, 1941, 1951 & 1955. Seen at Lonquimay in early 1970s, and shunting at Victoria in 1973 [Ron Ziel].
706	w/n 59018	Supervised by Concepción 1939, but San Eugenio in 1941, and back under Concepcion in 1951. Back under San Eugenio in 1955, so probably at least one mistake in these allocations.
707	w/n 59019	Listed under <i>Zona II</i> (MSE) in 1939, 1941 & 1951. One list suggests was under <i>Zona III</i> (MC) in 1951. Solely listed under <i>Zona II</i> (MSE) in 1955.
708	w/n 59020	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at Victoria and on Lonquimay line in 1981 [Geoff Hall]. Survives at San Rosendo.
709	w/n 59021	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
710	w/n 59022	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
711	w/n 59023	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1951 & 1955.
712	w/n 59024	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1951 & 1955. Also under <i>Zona II</i> (MSE) in 1955?.
713	w/n 59025	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1951 & 1955. Seen by me in steam on shed at Victoria in 1975.
714	w/n 59026	Listed under <i>Zona III</i> (MC) in 1939, 1941 & 1951. San Eugenio 1955. Seen in steam through Santa Fe in 1972 [Ron Ziel]. At Victoria in 1974 [10]. Preserved in Santiago.
715	w/n 59027	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1951 & 1955. At Osorno 1977 [21], 1978 [22] and 1979.
716	w/n 59028	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1951 & 1955. At Valdivia in 1972 [20]. At Osorno 1977 [21].

717	w/n 59029	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1951 & 1955. At Osorno 1977 [21].
718	w/n 59030	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1951 & 1955. At Osorno 1977 [21]. Preserved in Temuco Railway Museum.
719	w/n 59031	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1951 & 1955.
720	w/n 59032	Listed under <i>Zona III</i> (MC) in 1939, 1941, 1951 & 1955. Seen in steam at Osorno in 1976 [35].

53 locos in class listed around 1928 [36], 1941 & 1951. 1955 list says 56 locos, but incorrect owing to double counting. 53 still in fleet list in 1957 [49], and in 1965 and 1968 [*EFE memorias anuales*]. 31 in fleet list in 1979 [49] though not all in use.

Electric headlights

January 1920 the *Consejo Administrativo* noted the advantages of electric headlights as fitted to the Mikados recently purchased, and resolved to buy 100 turbo-generators for fitting to other locos.

Coal strike

Also in 1920 there was a prolonged coal miners' strike in Chile, and great efforts were made to find other sources of coal – from the USA, UK and Australia. The *Red Norte* was buying in wood for fire-lighting.

1920 proposals for new locos

In mid 1920 the *Consejo Administrativo* was considering purchasing 30 more Mikados and 10 *locomotoras pasajeros tipo Baldwin*, also 20 more *tipo Ws* for the metre gauge and one Mallet 2-6-6-2. Of the tenders for the 30 Mikados, ALCo's was the cheapest. ALCo's tender for the Mallet was the cheapest, but Baldwin's tender included the provision of a mechanical stoker and it was this tender that was recommended for acceptance. As many parts as possible were to be compatible with the *tipo Ws*. Later in the year (Aug.-Sept) Henschel elaborated on their offer to build ten Pacifics for the broad gauge, with all ancillaries identical to those on the Mikados. The *Consejo administrativo* recommended that all of the above should be purchased.

Piston valves for *tipo 57* and *58*

Also in 1920 the purchase of sets of piston valves for 25 *tipo 58s* and 15 *tipo 57s* was agreed. Whilst the fitting of piston valves and superheating no doubt improved the efficiency of these locos, the addition of a piston valve block above the original cylinder block must be regarded as a 'cheap and cheerful' compromise rather than best practice. Such an arrangement would inevitably add more 'clearance volume' to the ports beyond the inlet valves and thus would increase steam consumption by comparison with that which would have been used by a single combined and purpose-designed block.

Superheating for *tipos 57* and *58* and others

The *EFE memoria anual* for 1920 (p318) discusses fitting superheating to 25 locos of *tipo 58* and 15 of *tipo 57*. (p327) "Desde hace algun tiempo el Departamento de Traccion i Maestranzas se ha dado preocupado de colocar sobrecalentador en la mayor parte de las locomotoras de la I Zona. Actualmente el número de locomotoras provistas de este disponi(?) el el siguiente: En 20 locomotoras Mikado. En 10 locomotoras Baldwin. En 13 locomotoras North British de carga. En 2 locomotoras Rogers de carga. En 2 locomotoras Nacional de pasajeros. Se encuentran ya listos para ser colocados, 20 equipos para locomotoras North British de pasajeros, trabajo que irá realizándose a medida que las locomotoras de este tipo entren a reparacion. Del mismo modo las locomotoras tipo 52 (Borsig) cuya traformacion ya se ha noticiado(?), serán provistas de sobrecalentador."

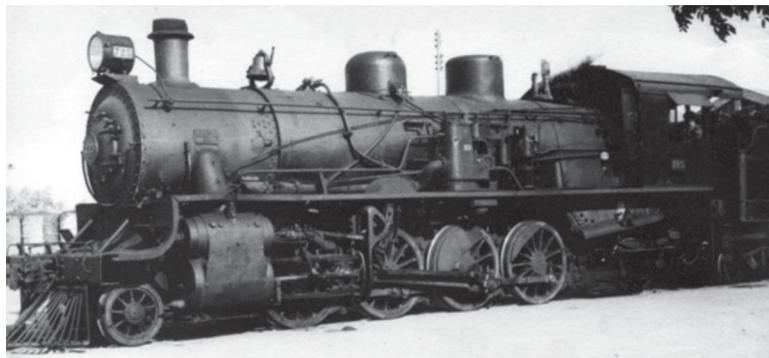
Tipo 70

2-8-2 d/w 1422mm 56", cyls. 560x711mm 22"x28", built by ALCo -Schenectady in 1921

(2nd batch +)

721	w/n 63146	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32]. At Osorno 1977 [21].
722	w/n 63147	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. At Osorno 1976 [35] and 1977 [21]. Seen in steam south of Osorno in 1976-7 [Raymond March].
723	w/n 63148	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. At Osorno 1977 [21].
724	w/n 63149	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
725	w/n 63150	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
726	w/n 63151	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
727	w/n 63152	Listed under <i>Zona II</i> (MSE) in 1939, but also under <i>Zona III</i> (MC)!? Definitely listed under <i>Zona III</i> (MC) in 1941, 1951 & 1955. Seen at Temuco in 1971-2 [32]. At Osorno 1977 [21].
728	w/n 63153	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
729	w/n 63154	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32]. Preserved in Temuco Railway Museum.

53 locos in class listed around 1928 [36], 1941 & 1951. 1955 list says 56 locos, but incorrect owing to double counting. 53 still in fleet list in 1957 [49], and in 1965 and 1968 [*EFE memorias anuales*]. 31 in fleet list in 1979 [49] though not all in use.



Tipo 70 number **725** with a Worthington feedwater heater midway along the boiler.

Tipo 70

(3rd batch +)

2-8-2 d/w 1422mm 56", cyls. 560x711mm 22"x28", built by ALCo -Schenectady in 1925

Copeland says from **730** onward had cyls. 560x710mm. Again, one or both of the final two locos, nos. **740** and **741**, may have been assembled in Chile from parts supplied. Chilean enthusiast sources have stated that nos. **720**, **741** and **742** were all assembled in Chile, but strangely both **720** and **742** are shown in Connelly's ALCo list.

730	w/n 63155	Listed under <i>Zona II</i> (MSE) in 1939, but under <i>Zona III</i> (MC) in 1941, 1951 & 1955. Seen at Temuco in 1971-2 [32]. 1977 was seen between Osorno and Pto. Montt.
731	w/n 63156	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
732	w/n 63157	Listed under <i>Zona II</i> (MSE) in 1939 & 1941, and under <i>Zona III</i> (MC) in 1951 & 1955.
733	w/n 63158	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen in steam at Temuco in 1977 [John West].

734	w/n 63159	Listed under <i>Zona</i> II (MSE) in 1939 & 1941, and under <i>Zona</i> III (MC) in 1951 & 1955. Seen at Temuco in 1969-70 [Ken Mills] and San Rosendo in 1971-2 [32]. Seen at Temuco 1973 [ERS].
735	w/n 63160	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Also listed as under <i>Zona</i> III (MC) in 1955. Seen at Temuco in 1971-2 [32]. Seen in steam at Temuco in 1979 [Keith Chester photo].
736	w/n 63161	Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955. Seen at Lollenco in 1971-2 [32].
737	w/n 63162	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
738	w/n 63163	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Also listed under <i>Zona</i> III (MC) in 1955. At Antilhue in 1974 [10].
739	w/n 63164	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Seen at Insp. Fernandez in 1971-2 [32], and also at San Rosendo in 1972 [Ron Ziel].
740	w/n 63165	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Seen at San Rosendo in 1971-2 [32]. Seen at Temuco 1973 [ERS].
741	Not shown in Connelly's ALCo list.	Probably assembled at MSB from spare parts. Listed under <i>Zona</i> II (MSE) in 1939, but also <i>Zona</i> III (MC). Solely listed under <i>Zona</i> III (MC) in 1941 & 1951. Back to being listed under <i>Zona</i> II (MSE) in 1955.

53 locos in class listed around 1928 [36], 1941 & 1951. 1955 list says 56 locos, but incorrect owing to double counting. 53 still in fleet list in 1957 [49], and in 1965 and 1968 [EFE memorias anuales]. 31 in fleet list in 1979 [49] though not all in use.

Tipo 70 *(4th & last batch)*
2-8-2 d/w 1422mm 56", cyls. 609x711mm 24" x28", built by ALCo -Schenectady in 1925

742	w/n 66560	Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955. At Temuco in 1974 [10].
743	w/n 66561	Listed under <i>Zona</i> III (MC) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
744	w/n 66562	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955.
745	w/n 66563	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Seen at Temuco in 1971-2 [32].
746	w/n 66564	Listed under <i>Zona</i> II(MSE) in 1939, 1941, 1951 & 1955. Derailed at Lontue (or San Carlos de Nuble?) by Chillán earthquake on 22 Jan 1939 [Zigzag photo]. Seen at San Bernardo in 1971-2 [32].
747	w/n 66565	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Painted brown by MSB around 1977-8 owing to a shortage of black paint [ITN]. Seen in steam at Loncoche in 1981 [35] and at Victoria in same year.
748	w/n 66566	Listed under <i>Zona</i> III (MC) 1939, 1941, 1951 & 1955. At Osorno in 1972 [20 and 32]. At Valdivia 1977 [21].
749	w/n 66567	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955.
750	w/n 66568	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Seen at Puerto Montt in 1969-70 [Ken Mills] At Osorno 1968 (DTR), 1977 [21]. Also seen between Osorno & Pto Montt 1977 [Raymond March].

751	w/n 66569	Listed under <i>Zona</i> I (MByC) in 1939 & 1941, and at San Eugenio in 1951 & 1955. At Osorno in 1972 [20 and 32].
752	w/n 66570	Listed under <i>Zona</i> III (MC) 1939, 1941, 1951 & 1955. At Osorno 1977 [21].
753	w/n 66571	Listed under <i>Zona</i> II (MSE) in 1939 & 1941, Listed under <i>Zona</i> III (MC) in 1951 & 1955. Seen at San Bernardo in 1971-2 [32].

53 locos in class listed around 1928 [36], 1941 & 1951. 1955 list says 56 locos, but incorrect owing to double counting. 53 still in fleet list in 1957 [49], and in 1965 and 1968 [*EFE memorias anuales*]. 31 in fleet list in 1979 [49] though not all in use.

Tipo 55

(2nd & last batch)

2-6-0 d/w 1422mm 56", cyls. 432x609mm 17"x24", possibly assembled from spares during 1920s

However, no. **492** might alternatively have been ex *Allard Dolfus Sillard et Wiriot* contractor, since their loco '**LUZ**' was identical to *tipo* 55. If so, this loco had been built by Baldwin in 1912 for their Talcahuano naval dock contract.

492² w/n 37894? Listed under *Zona* II (MSE) in 1939, 1941, 1942, 1951 & 1955.

Twenty listed in post-1908 *EFE* diagram book [24]. 20 in class in 1921, all in the 2nd zone. 21 in active fleet around 1928 [36], presumably after construction or purchase of no. **492** during 1920s. 21 in active fleet in 1941, 1942 & 1951 [37]. 20 surviving in fleet in 1957 [49]. 9 locos in class still in fleet list in 1965, and 8 in 1968 [*EFE memorias anuales*].

Tipo 80

(1st batch +)

4-8-2 d/w 1676mm 66", cyls. 571x711m 22½"x28", built by Baldwin in 1929

Ordered as light 4-8-2s for express passenger duties Santiago to Talca, San Antonio and Cartagena. BLW spec in vol. 79 p326+.

Fitted with Worthington feed-water heaters supposedly from 813 onward, but a loco in the 1929 video mentioned below clearly carries one. Later batches had thermic syphons, and also had revised weight distribution with a higher axle loading on the driving wheels. By then they were undertaking wider mainline duties and could be moved further south as electrification took over their original tasks.

The first batch were shipped from Eddystone on the MS *Belpareil* along with a number of *tipo* W 2-8-2s for the *Red Norte*. The loading of the ship can be seen in a video clip at <https://www.youtube.com/watch?v=ilqmZHtAvJs&fbclid=IwAR2lI3mXmIvqb6juYAqMbgw08TYEwEA7JrwBmNWELXrj46VD8II0fuKlqCI>

801	w/n 61106	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
802	w/n 61107	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Seen at San Rosendo in 1971-2 [32]. Survives at San Rosendo.
803	w/n 61108	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Seen in steam at Temuco in 1979 [P. Wittmann]. Given intermediate overhaul in 1982-3 and placed in strategic reserve [48]. Preserved in Temuco Railway Museum.
804	w/n 61109	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Seen at Concepción in 1971-2 [32].
805	w/n 61110	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
806	w/n 61111	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Seen at Concepción in 1971-2 [32], also in 1973.
807	w/n 61112	Listed under <i>Zona</i> II (MSE) in 1939, 1941, and by <i>Zona</i> III (MC) in 1951 & 1955.
808	w/n 61113	Listed under <i>Zona</i> II (MSE) in 1939, 1941, 1951 & 1955. Seen at

		Concepción in Dec. 1969? [Ken Mills] and 1971-2 [32].
809	w/n 61114	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32]. Seen in steam at Santa Fe in 1977 [Raymond Marsh].
810	w/n 61115	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at Temuco in 1971-2 [32].
811	w/n 61116	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
812	w/n 61117?	[48] suggests this loco was assembled from spare parts, but it seems to have a BLW works number. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen in steam at Victoria in 1981 [Helmut Dahlhaus]. Eventually dumped at San Rosendo [48].

All intact in 1955, and 1957 [49]. 12 locos in this batch still in fleet list in 1965 and 1968 [*EFE memorias anuales*]. 41 members of class still in fleet list in 1979 [49] though not all in service.



BLW builder's pic. High res versions available from the Railroad Museum of Pennsylvania.

Tipo 90

(1st batch +)

2-8-2 d/w 1420mm 56", cyls. 621x711mm 24½" x28" built by Krupp in 1935

Despatched October 1935 from Essen, according to Jens Schindler. Fitted with mechanical stokers. These 1935 orders placed in Germany were said to have been in exchange for German purchases of nitrate [*Burnley Express* and other UK papers, January 1935].

901	w/n 1463	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
902	w/n 1464	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
903	w/n 1465	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Preserved at MSB in 1974 [10]. Given intermediate repair at MSB in 1984 [49] but never re-entered regular service. Preserved in Santiago at Quinta Normal museum. Reportedly steamed recently but not fit for train haulage owing to mechanical stoker being incomplete and cow-catcher having been borrowed for a <i>tipo 80</i> loco.
904	w/n 1466	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
905	w/n 1467	Listed under <i>Zona II</i> (MSE) in 1939, 1941 & 1955. Seen in yard at MSB in 1969-70 [Ken Mills].

All transferred to *Zona III* after electrification to Talca, but did not last long as electrification extended further [49]. All 15 locos in class still in fleet list in 1957 [49], and in 1965 and 1968 [*EFE memorias anuales*].



Tipo 90

(2nd & last batch)

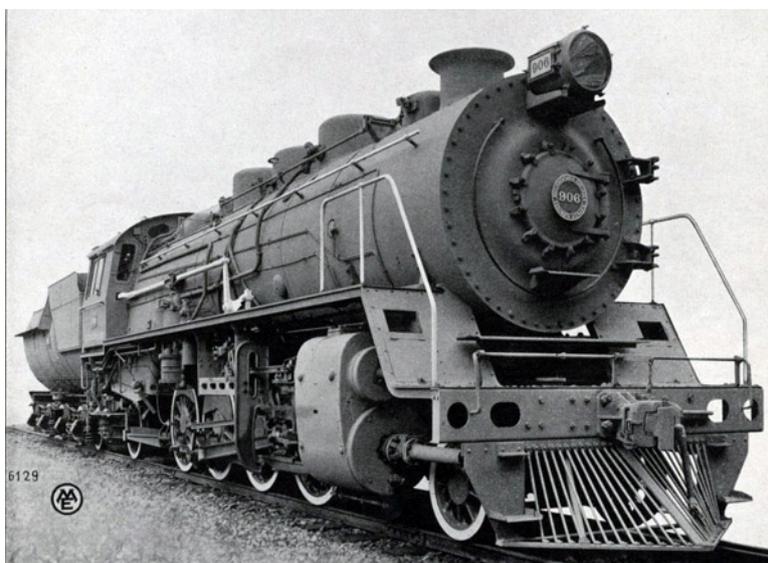
2-8-2 d/w 1420mm 56", cyls. 621x711mm 24½" x28", built by Esslingen in 1935

Fitted with mechanical stokers. These 1935 orders placed in Germany were said to have been in exchange for German purchases of nitrate [*Burnley Express* and other UK papers, January 1935].

906	w/n 4294	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
907	w/n 4295	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
908	w/n 4296	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
909	w/n 4297	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
910	w/n 4298	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
911	w/n 4299	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
912	w/n 4300	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
913	w/n 4301	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
914	w/n 4302	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
915	w/n 4303	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.

All transferred to *Zona III* after electrification to Talca, but did not last long as electrification extended further [49].

All 15 locos in class still in fleet list in 1957 [49], and in 1965 and 1968 [*EFE memorias anuales*].



A photo from the front of an Esslingen publication.

Tipo 100

(1st & only batch)

4-8-4 d/w 1676mm 66", cyls. 621x711 mm 24½"x28", by Henschel in 1936

PM says nos. **1001** and **1002** were named 'CHILE' and 'ALEMANIA' respectively. One batch arrived on board the NDL motor vessel 'Osnabrück' at Valparaiso, possibly before the end of 1935. Fitted with mechanical stokers. These 1935 orders placed in Germany were said to have been in exchange for German purchases of nitrate [*Burnley Express* and other UK papers, January 1935].

1001 'ALEMANIA'	w/n 22741	Supposedly named on arrival, though not certain whether it actually bore the name. However, an article in German from the time mentions a 'kupfernes Namensschild' or copper name-plate. Listed under <i>Zona II</i> in 1939, 1941 & 1951.
1002 'CHILE'?	w/n 22742	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
1003	w/n 22742	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
1004	w/n 22744	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
1005	w/n 22745	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
1006	w/n 22746	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
1007	w/n 22747	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
1008	w/n 22748	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955.
1009	w/n 22749	Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Preserved

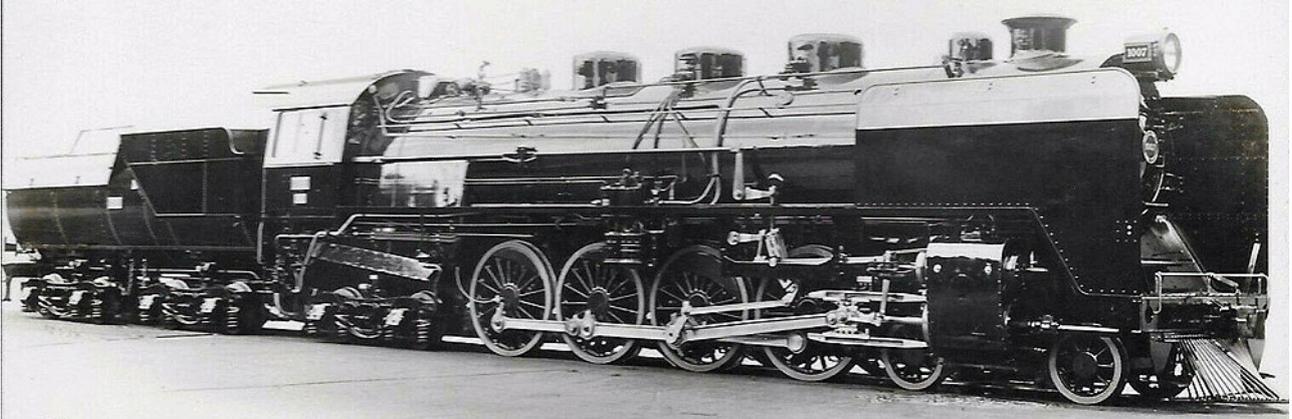
at MSB in 1969-70 [Ken Mills] and 1974 [10]. Preserved at Parque Quinta Normal in Santiago.

1010

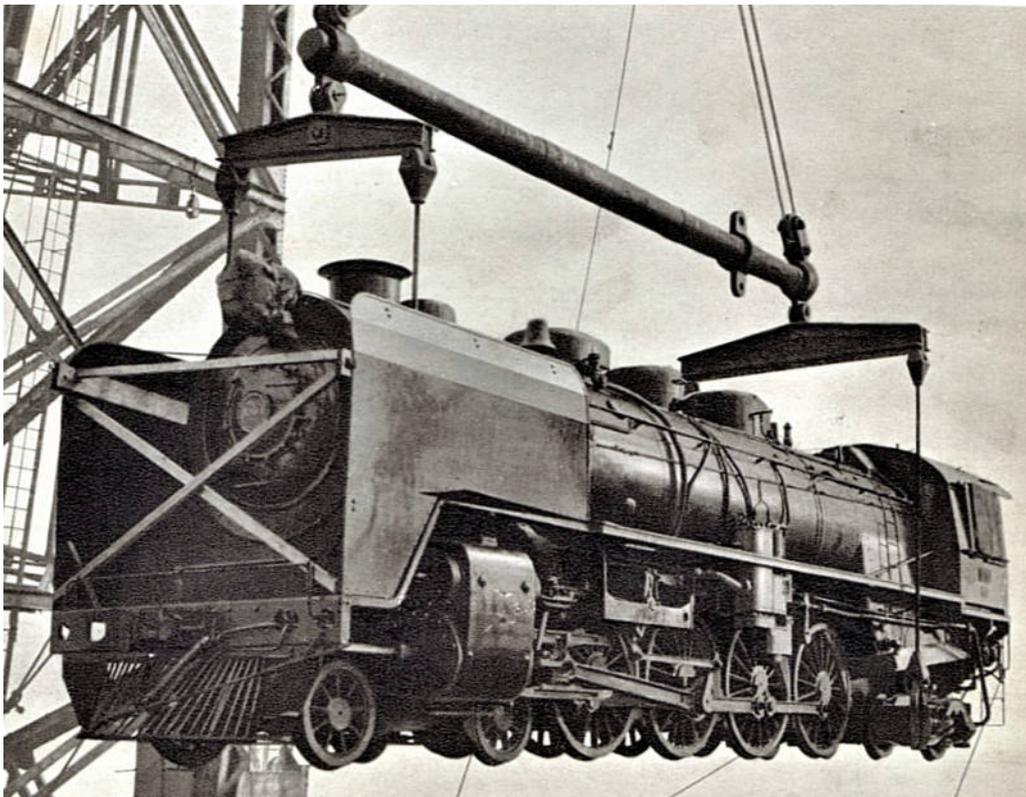
w/n 22750

Listed under *Zona II* (MSE) in 1939, 1941, 1951 & 1955. At MSB in 1974 [10].

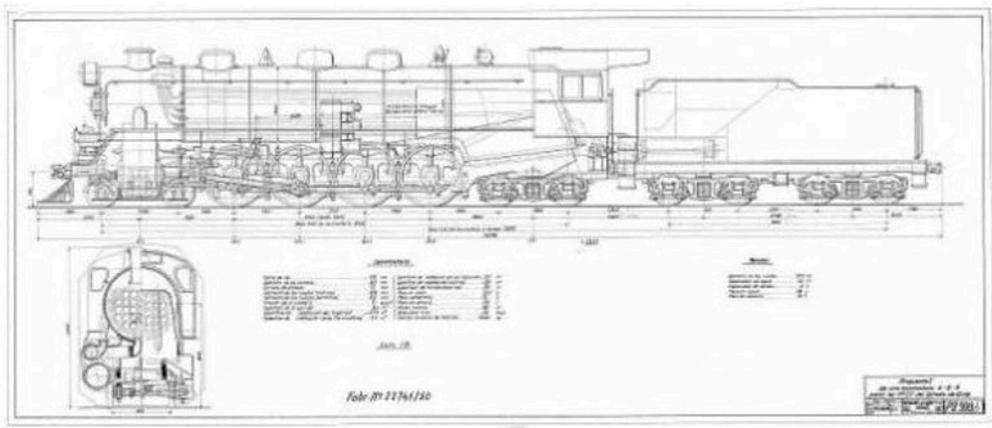
All transferred to *Zona III* after electrification to Talca, but did not last long as electrification extended further [49]. All 10 locos in class still in fleet list in 1957 [49], and in 1965 and 1968 [*EFE memorias anuales*].



Tipo 100 number **1007**. Note that, unusually, the loco trailing truck appears to be of the same design as the tender bogies.



An illustration from the front of a Henschel publication showing one of these engines suspended from a crane during its shipment to Chile.



This drawing, showing a 4-8-4 design supposedly for an order via Ferrostaal in Santiago, is available at the online shop of the Henschel Museum at <https://www.henschel-museum.com/2d2-h2-mikado-22741-50.html>. It might well be an early draft for the *tipo 100* locos but there are significant differences from the class as built, notably the tender.

Tipo 80

(2nd batch +)

4-8-2 d/w 1676mm 66", cyls. 571x711m 22½" x28", built by Baldwin in 1937

BLW class 14-39¼E nos. 1-7. Spec. is in vol. 82 p688-705. Erecting card drawing 318-16BX is in the DeGolyer Library collection. See appendix for notes about the introduction of these engines into service.

- | | | |
|------------|-----------|--|
| 813 | w/n 62241 | Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32]. |
| 814 | w/n 62242 | Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32]. |
| 815 | w/n 62243 | Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32]. |
| 816 | w/n 62244 | Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at San Bernardo in 1971-2 [32]. |
| 817 | w/n 62245 | Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at Concepción in 1971-2 [32]. Seen in steam at Loncoche & Temuco in 1981 [Geoff Hall, also Helmut Dahlhaus]. |
| 818 | w/n 62246 | Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. Seen at Concepción in 1971-2 [32]. |
| 819 | w/n 62247 | Again [48] suggests that this final loco was assembled from spare parts, but again it seems to have a BLW works number. Listed under <i>Zona II</i> (MSE) in 1939, 1941, 1951 & 1955. In steam at Victoria in 1973 [Ron Ziel]. |

All intact in 1955, and 1957 [49]. All 12 locos from the 1937-40 batches still in fleet list in 1965 [*EFE memoria anual*]. 41 members of class still in fleet list in 1979 [49] though not all in service.

Tipo 57 'North British de carga' (6th & last batch?)
2-6-0 d/w 1422mm 56", cyls. 457x660mm 18"x24", possibly built by the EFE's own workshops?

These numbers appear as late additions to *tipo 57* in Copeland and Kirchner's list, but with no sources suggested for the information. None of these appear in the 1939, 1941, 1942, 1951 or 1955 working timetable loco lists, so if they actually existed they must have been built after those dates. It seems increasingly unlikely that these were actually built.

- 8²
- 9²
- 10²
- 610

Tipo 01 Shays (1st & only batch)
0-4-4-0 Three truck Shays, 80 ton, built by Lima in 1911

Acquired by *EFE* in 1940 on the takeover of the Lebu to Los Sauces railway.

- | | | |
|------------|----------|--|
| 648 | w/n 2454 | ex <i>FC Lebu a Los Sauces</i> (Chilean Eastern Central Railway) no. 3 . Listed under <i>Zona III</i> (MC) in 1941. Dismantled 1949 [1951 <i>EFE</i> blue-print loco list]. |
| 649 | w/n 2468 | ex <i>FC Lebu a Los Sauces</i> (Chilean Eastern Central Railway) no. 4 . Listed under <i>Zona III</i> (MC) in 1941, 1951 & 1955. |

1 in list in 1951 & 1955.

Tipo 56A (1st & only batch)
0-6-0T d/w 42", cyls. 15x22", 30 tonnes [17]. built by Hawthorn Leslie in 1911. Acquired by *EFE* in 1940.

- | | | |
|------------|----------|--|
| 650 | w/n 2862 | ex <i>FC Lebu a Los Sauces</i> (Chilean Eastern Central Railway) no. 1 . Listed under <i>Zona III</i> (MC) in 1941, 1951 & 1955. |
| 651 | w/n 2863 | ex <i>FC Lebu a Los Sauces</i> (Chilean Eastern Central Railway) no. 2 . Listed under <i>Zona III</i> (MC) in 1941, 1951 & 1955. Seen in steam at Lebu in Dec.(?) 1969 [Ken Mills]. |

2 locos in fleet in 1951 & 1955. 2 locos in class still in fleet list in 1965 and 1968 [*EFE memorias anuales*]. However [49] suggests none in service in 1957 but 1 back in use in 1968.

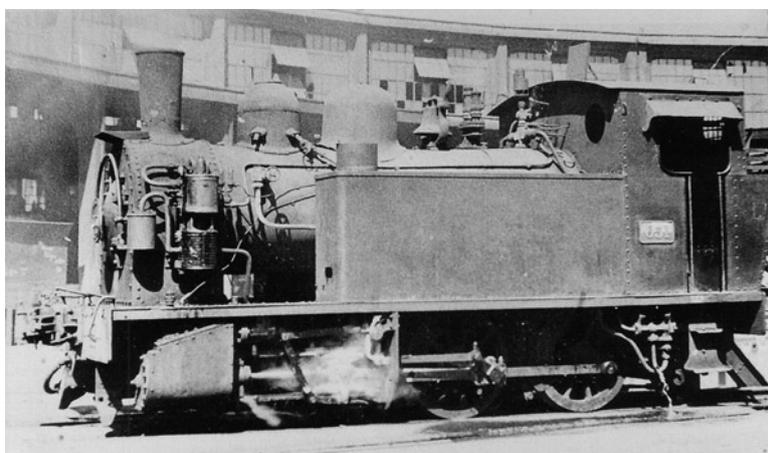
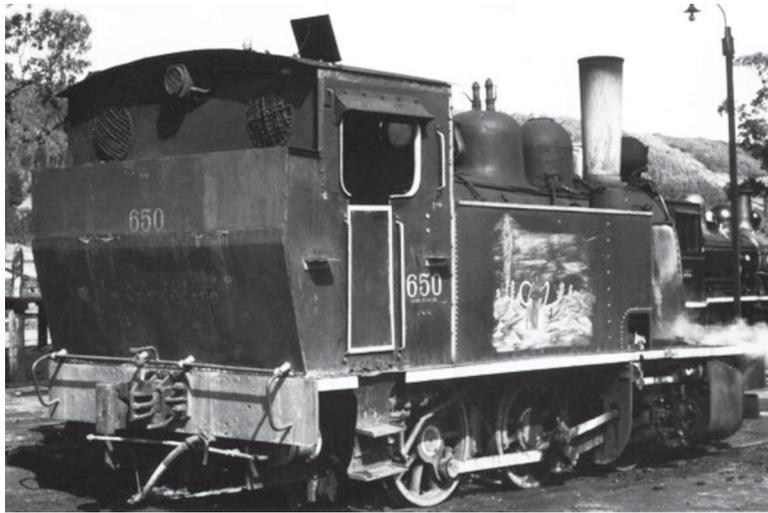


Photo shows loco modified from original condition by addition of air-pump, replacement of capped chimney by a stove-pipe, sun-visor added over cab doorway, and sand-dome and turbo-generator added on boiler top.



A photo by Ken Mills showing no. **650**, with a welded bunker and a slightly taller chimney than that shown above.

Tipo 80

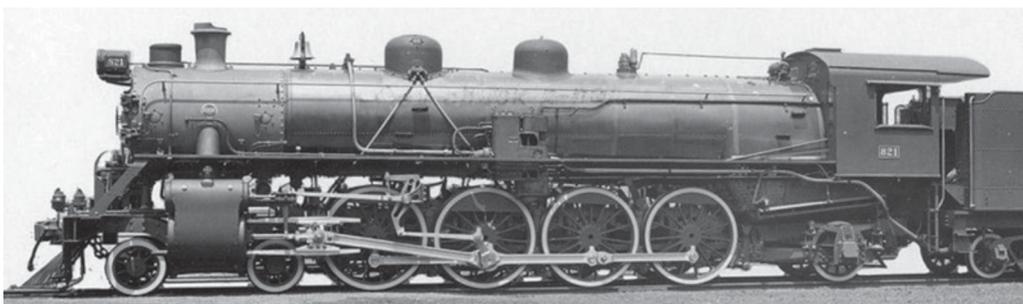
(3rd batch +)

4-8-2 d/w 1676mm 66", cyls. 571x711m 22½"x28", built by Baldwin in 1940

BLW new class 4-8-3 22½S nos. 8-12. Spec. is in vol. 82 pp706-720. Fitted with Worthington feed-water heaters type 2-BL-2.

820	w/n 62422	Allocated to <i>Zona III</i> (MC) in 1951 & 1955. Seen at Temuco in 1971-2 [32]. Given intermediate overhaul in 1982-3 and placed in strategic reserve [48]. [49] states that unusually it carries MC (= Maestranza Concepción) rather than MSB on its smokebox numberplate as that was where the work was done. Preserved in Temuco Railway Museum.
821	w/n 62423	Photographed at San Rosendo Loco in 1941. Allocated to <i>Zona III</i> (MC) in 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
822	w/n 62424	Allocated to <i>Zona III</i> (MC) in 1951 & 1955. At Temuco in 1974 [10]. Seen in steam at Concepcion in 1968 [35].
823	w/n 62425	Allocated to <i>Zona III</i> (MC) in 1951 & 1955. Displayed near Maestranza Barón in 1987 [W. Simms pic]. Survives at Villa Alemana.
824	w/n 62426	Allocated to <i>Zona III</i> (MC) in 1951 & 1955. Seen at Concepción in 1971-2 [32], and in steam at Temuco in 1978.

None of these in 1941 fleet list, so may not have arrived at that time. All intact in 1955, and 1957 [49]. 12 locos from the 1937-40 batches still in fleet list in 1965 and 1968 [EFE memorias anuales]. 41 members of class still in fleet list in 1979 [49] though not all in service.



Tipo 80 number **821** is seen here with a Worthington feed-water heater midway along the boiler.

Tipo 110

(1st & only batch)

4-8-2 d/w 1676mm 66", cyls. 634x762mm 25"x30", by ALCo-Schenectady built 7/1940

Largely used on freight traffic between Santiago and Talca. Fitted with mechanical stokers. Max axle load 25 tonnes, and total weight 220 tonnes.

1101	w/n 69324	Allocated to <i>Zona II</i> (MSE) in 1941, 1951 & 1955.
1102	w/n 69325	Allocated to <i>Zona II</i> (MSE) in 1941, 1951 & 1955.
1103	w/n 69326	Allocated to <i>Zona II</i> (MSE) in 1941, 1951 & 1955.
1104	w/n 69327	Allocated to <i>Zona II</i> (MSE) in 1941, 1951 & 1955.
1105	w/n 69328	Allocated to <i>Zona II</i> (MSE) in 1941, 1951 & 1955.
1106	w/n 69329	Allocated to <i>Zona II</i> (MSE) in 1941, 1951 & 1955.
1107	w/n 69330	Allocated to <i>Zona II</i> (MSE) in 1941, 1951 & 1955.
1108	w/n 69331	Allocated to <i>Zona II</i> (MSE) in 1941, 1951 & 1955.
1109	w/n 69332	Allocated to <i>Zona II</i> (MSE) in 1941, 1951 & 1955..
1110	w/n 69333	Allocated to <i>Zona II</i> (MSE) in 1941, 1951 & 1955. Preserved at MSB

10 locos in class still in fleet list in 1957 [49], and in 1965, but 0 in 1968 [EFE memorias anuales]. All had been dumped at MSB following electrification between Santiago and Talca in 1965.



A tipo 110 leaves Baldwin's plant on four flats, bearing the tender, a crate of parts, the fully-erected chassis and the boiler.





Photo from 'Trenes en la Web' Facebook page, taken in the Parque Quinta Normal museum.

Experimental rebuilds

In October 1940 *tipo 58 4-6-0* no. **554** came out of MSB with a pair of piston valve cylinders containing integral valve chests in the usual fashion. Nos. **539**, **555** and *Tipo 57 2-6-0* nos. **578** and **603** were also rebuilt likewise, and probably at the same time. These classes had of course been built with slide valves and then had all been rebuilt with 'bolt-on' piston valve chests, which would have been a cheap way of getting the benefit of piston valves but would have had the disadvantage of a very large clearance volume and thus a high steam and fuel consumption by modern standards. These rebuilds will presumably have been intended to find out whether it was worth rebuilding other members of both classes with new cylinders, but as no more were so treated it must be assumed that the experiment was unsuccessful or at least inconclusive. Photos of each of these locos as rebuilt can be found on the pages where the locos themselves are listed.

Originally *grupo 1*, later *tipo U*, eventually *tipo 1-U* (Rack & adhesion, ex metre gauge) *0-8z2-2T d/w 940mm 37"*, *cyls. 480x500mm*, *built by Esslingen in 1911*

Batch ordered for Howard Syndicate construction work on Longitudinal railway [11]. Originally numbered **31-32**, and later **1-2**. In use between Palquico and Socavón in 1919. After the rack section was bypassed they were rebuilt 1944 to broad gauge for use on the *Red Sur* between Lebu and Triángulo. An *EFE memoria* from 1944 states that the work on the locos had been finished and that they were ready for use as soon as the rack had been completed.

3301	w/n 3606	Allocated to <i>Zona III</i> (MC) in 1951. Withdrawn 1952 dumped at San Bernardo [11]. Still in fleet list under <i>Zona III</i> (MC) in 1955.
3302	w/n 3607	Allocated to <i>Zona III</i> (MC) in 1951. Withdrawn? Still in fleet list under <i>Zona III</i> (MC) in 1955.

Both still in fleet list in 1958 [49] and in 1965 and 1968 [*EFE memorias anuales*].

Tipo 80

(4th batch +)

4-8-2 d/w 1676mm 66", *cyls. 571x711m 22½" x 28"*, *built by Baldwin in 1947*

The purchase of 9 to 12 more *tipo 80* locos was being considered during 1944. The last three engines in this batch of 15 were probably assembled at MSB from spare parts, thus explaining why they do not have Baldwin works numbers.

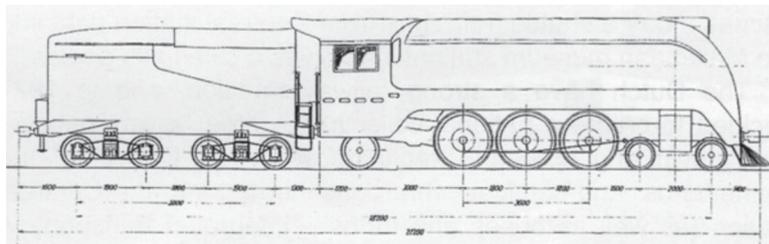
825	w/n 73102	Allocated to <i>Zona II</i> (MSE) in 1951 & 1955.
826	w/n 73103	Allocated to <i>Zona II</i> (MSE) in 1951 & 1955. Seen at Concepción in 1971-2 [32].
827	w/n 73104	Allocated to <i>Zona III</i> (MC) in 1951 & 1955. Seen at San Rosendo in 1971-2 [32]. Painted brown by MSB around 1977-8 owing to a shortage of black paint [ITN].
828	w/n 73105	Allocated to <i>Zona III</i> (MC) in 1951 & 1955. Seen at San Bernardo in 1971-2 [32].

829	w/n 73106	Allocated to <i>Zona III</i> (MC) in 1951 & 1955.
830	w/n 73107	Allocated to <i>Zona III</i> (MC) in 1951 & 1955.
831	w/n 73108	Allocated to <i>Zona III</i> (MC) in 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
832	w/n 73109	Allocated to <i>Zona III</i> (MC) in 1951 & 1955.
833	w/n 73110	Allocated to <i>Zona II</i> (MSE) in 1951 & 1955. Seen in steam at Temuco in 1979.
834	w/n 73111	Allocated to <i>Zona II</i> (MSE) in 1951 & 1955.
835	w/n 73112	Allocated to <i>Zona II</i> (MSE) in 1951 & 1955. Seen at San Rosendo in 1971-2 [32], and at Gorbea in 1981 [ERS].
836	w/n 73113	Allocated to <i>Zona II</i> in 1951 & 1955. Seen at San Bernardo in 1971-2 [32] and at Temuco in 1981 [Helmut Dahlhaus].
837		Built by whom? Allocated to <i>Zona III</i> (MC) in 1951 & 1955. Seen at San Bernardo in 1971-2 [32].
838		Built by whom? Allocated to <i>Zona III</i> (MC) in 1951 & 1955. Seen at San Rosendo in 1971-2 [32]. Photographed by A E Durrant in steam in 1977, location unknown.
839		Built by whom? Allocated to <i>Zona II</i> (MSE) in 1951 & 1955. At Osorno in 1972 [20 and 32].

All intact in 1955, and 1957 [49]. 15 locos from the 1947 batch still in fleet list in 1965 [*EFE memoria anual*]. 41 members of class still in fleet list in 1979 [49] though not all in service.

Proposed pacifics

Ian Thomson reports [45] that a government commission recommended in 1952 that 25 more *tipo 58* 4-6-0s be built for use south of Talca (*Zona 3*), and that Henschel responded to this by suggesting alternatively that light pacifics – either streamlined or not – be constructed. In the event, none of these were built but the *EFE* increased the order for extra *tipo 80* 4-8-2s from 20 to 30 units, see below.



Henschel sketch, via Ian Thomson and *Locomotives International* issue 111.

Tipo 80 (5th & last batch) 4-8-2 d/w 1676mm 66", cyls. 571x711m 22½"x28", built by Mitsubishi in 1952 (up to 859) and 1953 (860-869)

840	w/n 741	Allocated to <i>Zona II</i> (MSE) in 1955. Seen at San Rosendo in 1971-2 [32].
841	w/n 742	Allocated to <i>Zona II</i> (MSE) in 1955. Seen at San Bernardo in 1971-2 [32] and at Temuco station in 1982 [ERS]. Given intermediate overhaul in 1982-3 and placed in strategic reserve [48]. Painted in a lined out green livery around 1983, as the 'montaña verde' [ITN]. Preserved in Temuco Railway Museum.
842	w/n 743	Allocated to <i>Zona II</i> (MSE) in 1955. Seen at San Rosendo in 1971-2 [32]. Seen at Antilhue 1971 [ERS]. At Valdivia in 1974[10].
843	w/n 744	Allocated to <i>Zona II</i> (MSE) in 1955. Seen at Temuco in 1971-2 [32].

844	w/n 745	Allocated to <i>Zona</i> II (MSE) in 1955. Seen at San Bernardo in 1971-2 [32]. Seen in steam at Osorno in 1979 [Keith Chester photo], and at Collipulli [ERS] and Temuco [Geoff Hall] in 1981. Given intermediate overhaul in 1982-3 and placed in strategic reserve [48]. Preserved in Temuco Railway Museum.
845	w/n 746	Allocated to <i>Zona</i> III (MC) in 1955. Seen at San Bernardo in 1971-2 [32].
846	w/n 747	Allocated to <i>Zona</i> III (MC) in 1955. Seen at San Bernardo in 1971-2 [32]. Preserved at Parque Quinta Normal in Santiago.
847	w/n 748	Allocated to <i>Zona</i> III (MC) in 1955. Seen at San Bernardo in 1971-2 [32].
848	w/n 749	Allocated to <i>Zona</i> III (MC) in 1955. Seen at Temuco in 1971-2 [32, and Ron Ziel] and in 1979 [K. Chester] and 1983 [ITN]. Given intermediate overhaul in 1982-3 and placed in strategic reserve [48]. Preserved in Temuco Railway Museum.
849	w/n 750	Allocated to <i>Zona</i> III (MC) in 1955. Seen at San Bernardo in 1971-2 [32]. Seen in steam at Temuco in 1976 [35]. In steam in 1982. Given intermediate overhaul in 1982-3 and placed in strategic reserve [48]. Preserved in Temuco Railway Museum.
850	w/n 751	Allocated to <i>Zona</i> III (MC) in 1955. Seen at Temuco in 1971-2 [32]. At Temuco in 1974 [10].
851	w/n 752	Allocated to <i>Zona</i> III (MC) in 1955. Seen at San Bernardo in 1971-2 [32]. On shed at San Rosendo in 1983. Given intermediate overhaul in 1982-3 and placed in strategic reserve [48]. Preserved in Santiago, and was displayed at the Estación Central for the Día del Patrimonio Cultural in 2018.
852	w/n 753	Allocated to <i>Zona</i> III (MC) in 1955. Seen passing Rihue in 1972 [Ron Ziel].
853	w/n 754	Allocated to <i>Zona</i> III (MC) in 1955. Seen at San Bernardo in 1971-2 [32].
854	w/n 755	Allocated to <i>Zona</i> III (MC) in 1955. Seen at San Rosendo in 1971-2 [32].
855	w/n 756	Allocated to <i>Zona</i> III (MC) in 1955. Seen at Temuco in 1971-2 [32].
856	w/n 757	Allocated to <i>Zona</i> III (MC) in 1955. Seen at Temuco in 1971-2 [32]. At Temuco in 1973 [ERS] and 1974 [10].
857	w/n 758	Allocated to <i>Zona</i> III (MC) in 1955. Seen at San Bernardo in 1971-2 [32].
858	w/n 759	Allocated to <i>Zona</i> III (MC) in 1955. Seen at Temuco in 1971-2 [32]. Seen in steam at Victoria in 1981 [Geoff Hall, also Helmut Dahlhaus] also at Gorbea on a Talcahuano train that year [Enrique Rivera]. Given intermediate overhaul in 1982-3 and placed in strategic reserve [48]. Preserved in Temuco Railway Museum.
859	w/n 760	Allocated to <i>Zona</i> III (MC) in 1955. Seen at San Rosendo in 1971-2 [32]. At Temuco in 1974 [10].
860	w/n 767	Allocated to <i>Zona</i> III (MC) in 1955. Seen at San Bernardo in 1971-2 [32]. Seen at Afquintue in 1978 ([Robert Kingsford Smith].
861	w/n 768	Allocated to <i>Zona</i> III (MC) in 1955. Seen at San Bernardo in 1971-2 [32].

862	w/n 769	Allocated to <i>Zona III</i> (MC) in 1955. Seen at San Bernardo in 1971-2 [32]. In steam passing Rihue in 1973 [Ron Ziel]. At Osorno 1977 [21].
863	w/n 770	Allocated to <i>Zona III</i> (MC) in 1955. Seen at Temuco in 1971-2 [32].
864	w/n 771	Allocated to <i>Zona III</i> (MC) in 1955. Seen in steam at Temuco in April 1970 [Ken Mills].
865	w/n 772	Allocated to <i>Zona III</i> (MC) in 1955. Seen at San Bernardo in 1971-2 [32].
866	w/n 773	Allocated to <i>Zona III</i> (MC) in 1955. Seen at San Bernardo in 1971-2 [32].
867	w/n 774	Allocated to <i>Zona III</i> (MC) in 1955. At Antihue & Osorno in 1974 [10]. At Valdivia 1977 [21].
868	w/n 775	Allocated to <i>Zona III</i> (MC) in 1955. Seen at San Bernardo in 1971-2 [32]. At Temuco in 1974 [10].
869	w/n 776	Allocated to <i>Zona III</i> (MC) in 1955. Seen at Renaico in 1971-2 [32]. Seen in steam at Temuco [35] and Metrenco in 1976, and at Renaico in 1977 [ERS], also in steam at San Rosendo in 1977 [Raymond Marsh]. Overhaul started (in 1982-3?) but never finished [48]. Preserved in Temuco Railway Museum.

All intact in 1955, and 1957 [49]. 30 locos from the 1953 batch still in fleet list in 1965 and 1968 [*EFE memorias anuales*]. 41 members of class still in fleet list in 1979 [49] though not all in service.

***FC de Arauco* locomotives**

Question: did any of the *FC de Arauco* locomotives enter the *EFE* fleet when the railway's operations were taken over by the state in 1957, as the locos from other nationalised private railways had done?

Locos in red oxide

Towards the very end of broad gauge steam a number of locos were outshopped in red oxide rather than the usual black. This may well have been owing to a shortage of the usual paint.



Baldwin drawings

The collection of Baldwin drawings at the DeGolyer Library, Southern Methodist University, includes side elevation (SE) or cross section (CS) drawings for a number of designs built or proposed for the *EFE*.

<i>Tipo</i>	Index#	DWG#	Tracing#	Road name	Road#	Date	Baldwin class	Number	Wheel	Dwg typ	Size
44	175-21X	-	4104	Chilean State	243-246	1895	08-30 C	491	4-4-0	CS	30 X 75
44	175-21AX	-	4104	Chilean State	243-246	1895	08-30 C	491	4-4-0	SE	32 X 70

69	471A-95 4104	-	Chilean State	231-232	1901	10-30 E	20-21	2-8-0	SE/CS	3
46	471A-96 4110	-	Chilean State	277-282	1901	10-34 E	1617-1622	2-8-0	SE/CS	3
29	466A-90 4161	-	Chilean State	283-285	1902	08-24 1/3 D	16-18	0-6-2	SE/CS	3
L	468-28 4929	-	Chilean State		1904	08-24 D	131	2-6-0	SE/CS	3
56	473A-58 6097	-	Chilean State	487-491	1907	06-24 D	89-93	0-6-0	SE/CS	3
55	467-83 6055	-	Chilean State	467-486	1907	08-28 D	251-270	2-6-0	SE/CS	3
	516-28	-	14262	Chilean State	-	1907	10-00 D	4-6-0	SE/CS	5
	516-27	-	14263	Chilean State		1907	10-00 D	4-6-0	SE/CS	5
	5000A-53	-	15531	Chilean State	-	1908	12-30 ¼D	2-6-4	SE	3
	5002-60		66238	Chilean State	-	1931	16-00E	4-6-4	SE & Tend	5
	5000A-60	-	15950	Chilean State	-	1909	20-00 35/58 ¼EE	2-8-8-2	SE	4
W	399-33 9271	-	Chilean State	8	1921	12-34 1/4 E	46	2-8-2	SE/CS	6
	162-25CX	-	-	Chilean State		1922	16-63/75 1/4 DD	1-6	0-6-6-0	SE
80	318-16BX 13955	-	Chilean State	813-819	1938	14-39 1/4 E	1-7	4-8-2	SE	32 X 91

Those with no *tipo* number shown were proposals but presumably not built. The 4-6-0 from 1907 might well have been Baldwin's take on what eventually became the *tipo 58 North British de pasajeros*, or might have been an early proposal for *tipo 60*. The 1908 suggestion for a 2-6-4 sounds interesting, and would presumably have been a tank loco. The 1909 2-8-8-2 Mallet is even more intriguing, though the Baldwin class details have presumably got muddled up as those given here do not make sense. The same applies to the 1922 proposed 0-6-6-0 Mallet. Either or both of these articulated designs may well have been intended for the metre gauge.

The list of drawings in which these details were found is at <https://www.smu.edu/~media/Site/Libraries/degolyer/pdfs/BLW-EDWG-RoadName.pdf> whilst arrangements to purchase copies can be found at <https://www.smu.edu/libraries/degolyer/Research/Permissions> If anyone does raise the cash to order copies of any of these, then the present author would be most interested to hear of what is discovered.

1.3.1 The government's *Dirección de Obras Públicas*

Background

The *Ministerio de Industria y Obras Públicas* included the *Dirección General de Obras Públicas*, usually abbreviated to *DOP*, which oversaw all government construction work. This included the building of schools, prisons, roads, bridges, railways and ports. Typically in the case of railways, the process would successively involve an initial assessment, detailed design work, the appointment of a contractor and supervision of their work, the hire of locos and wagons to that contractor, inspection of the completed works, operation of the new railway for a few months, and then finally the hand-over to the *EFE*.

This section has therefore been laid out somewhat differently, as the locomotives concerned have almost all been met in the main *EFE* section, and the *DOP* fleet varied in content from year to year as engines were borrowed or returned. Thus the basic details of each loco are followed by notes showing where each machine was working at various time periods. Whilst by no means complete, these facts help to show when each loco was on *DOP* duties and how many were being used at any particular period. Commonly the locos were offered on hire to contractors engaged in construction works for the *DOP*, but might then be retained in direct *DOP* service until the new route was handed over to the *EFE* after a few months of operation.

Information relating to the locos' previous or later work for the *EFE* is set out in that section rather than here.

Tipo 15

4-4-0 d/w 1676mm 66", 381x609mm 15"x24", built by Baldwin in 1889 for the North & South American Construction Co.

BLW class 8 24C numbers 140-153. Unlike the other locos in this section, these Baldwin 4-4-0s were taken over *en bloc* by the *DOP* soon after their arrival, on the expropriation of the assets of the N&SACCo. (which had ordered them) from Sr. Julio Bernstein who had succeeded to the assets and liabilities of the company. Only from thence did they move on to the *EFE*. They were known sometimes as the *tipo Peñaflo*r, after the town outside Santiago, and presumably because that was the name of one member of the class. See an appendix at the tail end of this file for more details about the N&SACCo.

They did receive numbers in the *EFE* sequence, possibly after 1895 if their allocation to a block of numbers above the *tipo 38* 4-6-0s built that year is anything to go by. Their long-term numbers were therefore **261 to 274**, following that batch of fourteen *tipo 38*s which were numbered from **247** up to **260**. However, confusingly, numbers **250, 251** (see photo below), **256, 259** and **260** were also recorded (see below). Possibly these were earlier numbers allocated before the 38s arrived but still carried in *DOP* service until the first years of the new century. Coincidentally there were fourteen of these 4-4-0s and also fourteen of the *tipo 38*s. One may idly wonder whether there was some confusion when the numbers were first allocated to these two batches of engines.

Those on the isolated Valdivia to Osorno railway were recorded with a variety of numbers but with their names mostly remaining the same, ie. not merely a swop of names. There seem to have been up to ten of them hired out on the Valdivia to Osorno contracts but numbers **250, 256, 259, 260, 262, 263, 264, 265, 268, 271, 272, 273, and 274** were all mentioned there at one time or another. *DOP memorias* and other early documents have been known to get loco numbers wrong, but in the case of this batch of engines there are so many inconsistencies that a certain amount of renumbering seems likely. Note also that the numbers listed above span a much wider range than merely the number of locos built, ie. they cannot have merely resulted from number swops within this class.

Note also that the Baldwin works numbers have been listed in numerical order below, but the locos may have been renumbered as they were transferred individually to the *EFE* and therefore this assumption may be incorrect.

261 'LAUTARO' w/n 10002. Numbered **262** in 1901, 1903, 1904 and 1905.

From mid 1890s to early 1900s this engine was at Valdivia-Osorno hired to A. Nicolai or M. Ossa and then in direct *DOP* service. Not listed as on construction work in 1902. On the other hand [MOBR1237] implies that this loco was only shipped south to Valdivia in early 1900. Named 'LAUTARO' at Valdivia in 1901.

262 'PEÑAFLOR' w/n 10003. Recorded with that name/number combination in 1898.

Arrived by barge at Trumao on Río Bueno in late-1893 for use by the Pichi-Ropulli to Osorno contractor, Manuel Ossa. From late 1893 to early 1900s it was at Valdivia-Osorno hired to Señor Ossa and then in direct *DOP* service. On the other hand [MOBR1237] implies that this loco was shipped south to Valdivia in early 1900, perhaps after overhaul.

263 ‘VALDIVIA’ w/n 10006. NB This is not the same loco as **271 ‘VALDIVIA’**. There remains some confusion about such identity conflicts.

From mid 1890s had been hired to A. Nicolai at Valdivia until about 1901 but not retained there for the public service [4];

1902 Alcones to Cardonal.

[MOBR2012] lists this loco working (possibly from 1902) until 1905 between Pitrufulquén and Antilhue on Eugene Bobillier's contracts. Returned to *DOP* in March 1905 [MOBR2012], but noted in same document as being now on *FC Melipilla a San Antonio*. However, there is a question mark next to the loco number.

1910 Melipilla to San Antonio.

1912 Arrived that year at Cajón to Llaima, also see [MOBR2640]

1914 Púa to Curacautín.

1920 Still under *DOP* supervision but location unknown [2]. Withdrawn 1921?

263 ‘LUELLA’ but probably not the same loco as **263 ‘VALDIVIA’** above.

1903 identified as such after hire to A. Nicolai at Valdivia but may not have been retained there for the public service [4]. Loco **‘LUELLA’** earlier recorded on construction work for Sr. Nicolai in 1900 [MOBR1237].

263 ‘LONCOCHE’, very probably another case of renaming or numbering.

1902?-1905 Pitrufulquén to Loncoche, on hire to Eugene Bobillier [MOBR2012]. Returned to *DOP* in March 1905 [MOBR2012].

Nov. 1908 request that *EFE* return loco to Melipilla - San Antonio construction works.

264 ‘TALAGANTE’ w/n 10007.

Nov. 1901-1905 Pitrufulquén to Loncoche, on hire to Eugene Bobillier [MOBR2012]. Returned to *DOP* in March 1905 [MOBR2012].

1910 Reconstructed at Valdivia shops [1].

Loco with this number recorded as *‘detenidas’* at MSB during 1923 [3].

265 ‘MELIPILLA’ w/n 10008. Numbered **250** in 1898 and 1903. 4-4-0 no. **250** was seen in a pic at Huellelhue on construction trains in 1897 [8].

From mid-1890s had been hired by *DOP* to A. Nicolai at Valdivia but was not retained there for public use [4].

1902 Not listed as on construction work in *DOP memoria*.

1903 was numbered **250** [8].

190?-1905 Pitrufulquén to Loncoche, on hire to Eugene Bobillier [MOBR2012]. Returned to *DOP* in March 1905 [MOBR2012] with number **250**.

1910 Melipilla to San Antonio.

1912 Back with *EFE*?

1914 Púa to Curacautín [2].

1918 Seen in pic at Púa but no number visible [8].

Loco with this number recorded as *‘detenidas’* at MSB during 1923 [3].

266 ‘?’ w/n 10009.

No record of *DOP* service. Not listed as on construction work in 1902.

Withdrawn 1932?

267 ‘?’ w/n 10010.

1902 Working on construction trains, but location unknown.

268 ‘ANTILHUE’, w/n 10011. Numbered **268** in 1901, 1903, 1904 and 1905, but conflictingly also **256** in 1903 [4].

From mid 1890s to early 1900s was on Valdivia-Osorno hired to A. Nicolai and then in direct *DOP* service. Named '**ANTILHUE**' at Valdivia in 1901 [4].

269 'MALLOCO' w/n 10013.

1902 Working on construction trains, but location unknown.

190?-1905 Pitrufulquén to Loncoche, on hire to Eugene Bobillier [MOBR2012]. Returned to *DOP* in March 1905 [MOBR2012].

1910 General repair at Valdivia shops [1].

Loco with this number recorded as '*detenidas*' at MSB during 1923 [3].

270 '?' w/n 10017.

1902 Working on construction trains, but location unknown.

1930 Under *DOP* supervision but under repair at San Eugenio or Fabrica Copetta [3].

271 'VALDIVIA' w/n 10020. Numbered **271** in 1901, 1903, and 1904, but confusingly also numbered **264** and **270** (1905, both in same *MdT memoria!*) [4]. Also numbered **264** in 1907 [MOBR1900].

From mid-1890s to early 1900s was on Valdivia-Osorno line hired to A. Nicolai or M. Ossa and then in direct *DOP* service.

1901 letter in [MOBR1389] implies that it needs urgent overhaul but cannot be released until the loco '**LINARES**' has been repaired.

On Melipilla - San Antonio construction work in 1910, prior to:

August 1910 moved to Saboya presumably to act as shunter during work on the Lumaco and Cap.Pastene narrow gauge line [MOBR2307], probably in place of no. **70 'LINARES'**.

Withdrawn 1918? [PM] or under repair at San Eugenio or Fabrica Copetta in 1930.

272 'SAN JOSÉ' w/n 10021. Numbered **272** in 1901, 1903, 1904 and 1905, but conflictingly also **260** in 1903 [4].

From mid 1890s to early 1900s was on Valdivia-Osorno hired to A. Nicolai. Named '**SAN JOSÉ**' at Valdivia in 1901. Later in direct *DOP* service. Loco with this number leased to (contractor on?) *FC de Freire a Cunco* in 1931 [3].

273 'OSORNO' w/n 10022. Numbered **259** in 1898 but **273** in 1901, 1903, 1904 and 1905 [4], and in 1907 [MOBR1900].

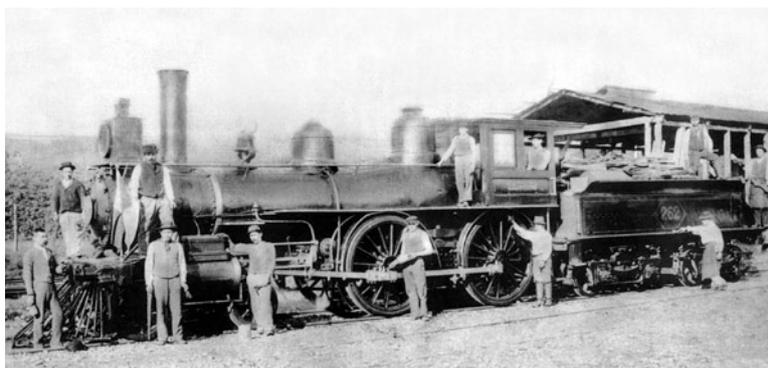
Arrived by barge at Trumao on Rio Bueno in mid-1893 for use by Pichi-Ropulli to Osorno contractor.

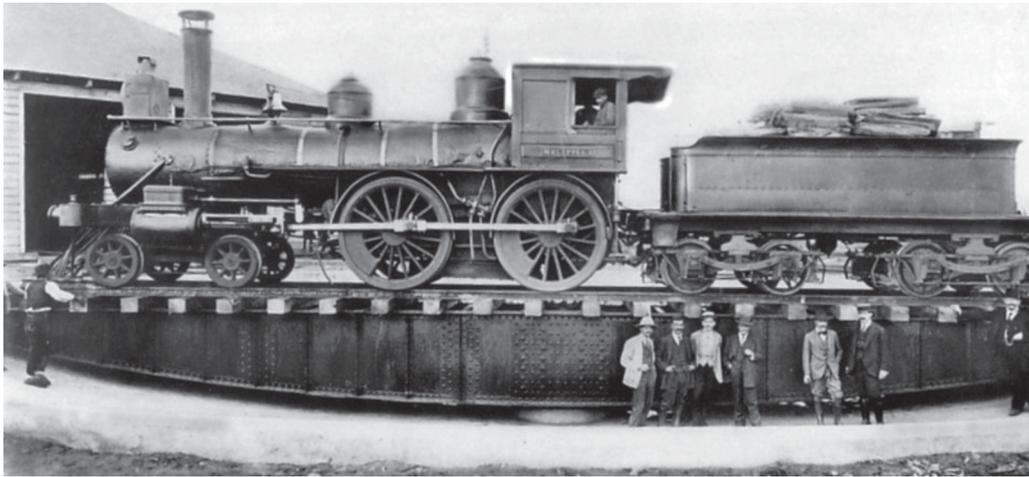
Confirmed in [*DOP Boletín* 1893 2nd semester p150]. From mid-1893 to early 1900s was on Valdivia-Osorno hired to M. Ossa and then in direct *DOP* service. Named '**OSORNO**', at Valdivia in 1901, but *Boletín DOP* 2nd Sem 1893 p45 sometimes numbered **259** [4].

274 'SAN VICENTE' w/n 10023. Numbered **274** in 1901, 1903, 1904 and 1905, but by 1904 renamed '**La UNIÓN**' and in 1905 called '**UNIÓN**' [4] in the *EFE memorias anuales*.

From mid 1890s to early 1900s was on Valdivia-Osorno line hired to A. Nicolai or M. Ossa and then in direct *DOP* service. A loco '**UNION**' arrived at Trumao by barge in 1893 for use on railing and ballast trains. Named '**SAN VICENTE**' at Valdivia in 1901, later renamed '**LA UNIÓN**' [4].

Nos. **262** and **267-274** were in 1902 working on lines under construction.

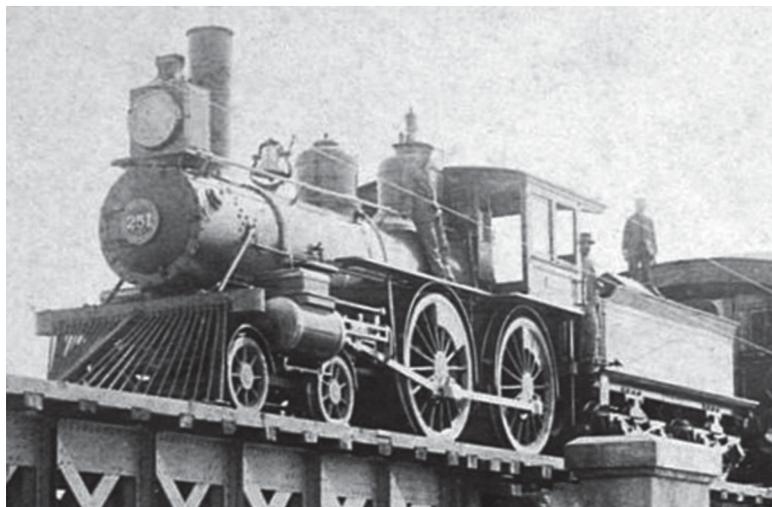




So far there is no obvious pattern linking the various alternative numbers of the above ex-N&SACCo locos. However, these are summarised below in the hope that sooner or later a logical pattern will become apparent.

No. in 247-260 series	No. in 261-274 series	Name	Other numbers recorded
	261	'LAUTARO'	262
	262	'PEÑAFLORES'	
	263?	'VALDIVIA'	
		'LUELLA'	
		'LONCOCHE'	
	264	'TALAGANTE'	
250	265	'MELIPILLA'	
	266		
	267		
256	268	'ANTILHUE'	
	269	'MALLOCO'	
	270		
	271	'VALDIVIA'	264, 270
260	272	'SAN JOSÉ'	
259	273	'OSORNO'	
	274	'SAN VICENTE' / 'La UNIÓN'	

Note that there are fourteen names listed above, and thus we possibly have a name for each of the fourteen locos.



Here is one of the *tipo 15* locos clearly numbered as **251**, thus proving that these engines were indeed numbered at one time in the earlier series later occupied by *tipo 38s*.

2-6-0 d/w 40", cyls. 12"x18", built by Lima in 1906 via W. R. Grace & Co. (Chile), possibly for SOP and then sold on to DOP. Identification likely but not certain.

1 w/n 1032

- 1910 Selva Oscura to Curacautín branch.
- 1912 Selva Oscura to Curacautín branch.
- 1910 Púa to Curacautín branch.
- 1930 Loncoche to Villarica.

2 w/n 1033

- 1910 Selva Oscura to Curacautín branch.
- 1912 Selva Oscura to Curacautín branch.
- 1910 Confluencia to Tomé.
- 1930 Loncoche to Villarica.

Unusually for *DOP* locos, so far there is no trace of these having joined the *EFE* fleet after their *DOP* careers.

2-6-0 d/w ?, cyls. ?, built by Borsig in 1906-7 for the Sindicato de Obras Públicas. Presumably later sold on to the *DOP* after the *Sindicato*'s contracts had been completed or terminated. The *Sindicato* had won the contracts to build the *FCALP* and the line from Curicó to Hualáñe (both metre gauge), the first eighteen kilometres of the Rucapehuen to Tomé route (broad gauge), and the Púa to Curacautín branch (broad gauge).

3 w/n 6010

- 1910 Osorno to Puerto Montt.
- 1912 Osorno to Puerto Montt.
- 1914 To *EFE* (ep)
- 1930 on Quino-Galvarino construction work.

4 w/n 6289 Sometimes referred to as no. **9**.

- 1910 Selva Oscura to Curacautín.
- 1912 To *EFE entregado provisorio*.
- 1913 Cajon to Llaima, working for Don Pablo Hoffman from July that year [MOBR2640].
- 1914 To *EFE* (ep)?
- 1930 on Quino-Galvarino construction work?

No trace has been found of these two locos in the *EFE* list.

0-4-0ST d/w 33¾", cyls. 10½"x16", built by Manning Wardle in 1893-4

"Mixed traffic tank locos". These may well have been the Manning Wardle locos visible in photos of the Valdivia to Osorno construction works. They were probably MW w/n 1266 and 1281 supplied via Woodgate Innes & Co. in 1893-4 and specified as their 'class F with some differences'.

'JOSÉ ANTONIO VADILLO'

From mid 1890s to early 1900s was on the Valdivia to Osorno railway hired to Adolfo Nicolai or Manuel Ossa.

1901 Out of service at Valdivia.

'MANUEL OSSA'

From mid 1890s to early 1900s was on Valdivia to Osorno railway hired to Adolfo Nicolai or more likely Manuel Ossa himself.

1901 Out of service at Valdivia.

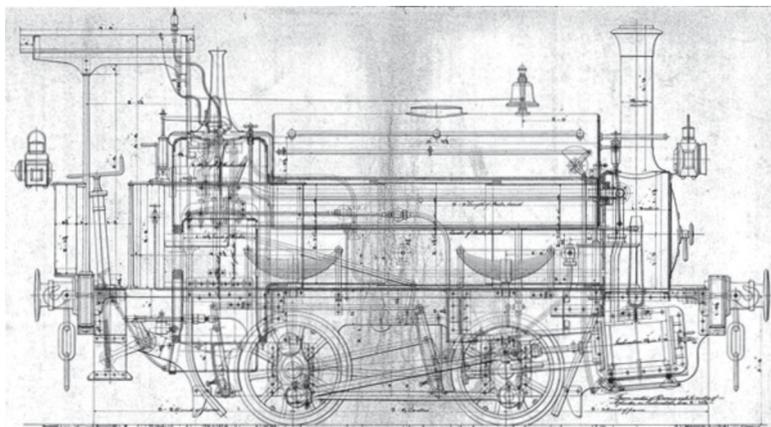
Tipo 67 locos, nos. **493** and **638** in the *EFE* fleet, have almost certainly been confirmed as these two locos, with no. **493** being **'MANUEL OSSA'**.



A Manning Wardle 0-4-0ST during Manuel Ossa's contract, on the old bridge in the barrio Guillermo Francke a few hundred metres north of Osorno station.



A similar Manning Wardle during Adolfo Nicolai's contract north of Pichi-Ropulli.



A Manning Wardle GA side elevation of no. 1266, from the Staffold Barn Farm archive collection.

Tipo 3

***4-4-0 d/w 1524mm 60", cyls. 381x609mm 15"x24", built by Hawthorn of Leith in 1855 as 0-4-2s
4 'ADELANTE' w/n ? ex FCSV no. 4.***

1912 Cajón to Llaima but described as a 2-6-0 [2], also see [MOBR2640].

1914 Still on Cajon to Llaima line.

On hire to DOP in 1920 [EFE memoria 1920 p323].

Tipo 13

4-4-0T d/w 1676mm 66", cyls. 355x609mm 14"x24", built by Rogers in 1859

63 'MAIPÚ' w/n 848 ex FC del Sur no. 6 'RANCAGUA' renamed.

1902?-1905 Pitrufrquén to Loncoche or Loncoche to Antilhue, on hire to Eugene Bobillier. Returned to *DOP* in March 1905 [MOBR2012].

Tipo 15

4-4-0 d/w 1676mm 66", cyls. 381x609mm 15"x24", built by Baldwin in 1874

70 'LINARES' w/n 3520 ex *FCS* no. **23**, ex *FCCCiT* no. **18**.

Operated for many years by the *DOP*, on hire to contractors;

1901 Abandoned after many years working in south and then sent to Lever Murphy for overhaul. Long list of work done is in [MOBR1389].

1902 Pitrufrquen to Loncoche. *ArNAd* file [MOBR1914] says contractor Eugene Bobillier complained that it had serious defects when delivered to him in 1900. Then repaired by Lever Murphy in 1901, repaired again 1903 and returned to Bobillier. It remained with him until in March 1905 he returned all his hired locos to the *DOP* [MOBR2012].

Oct. 1908 repaired at *Fabrica La Union* and then returned to Melipilla - San Antonio construction [MOBR2111].

1910 at Saboya as shunter for Capitán Pastene 60cm branch contractor.

1912 back with *EFE*?

1914 Puá to Curacautín.

1916 Puá to Traiguen for *Señores Corte Bertoglio i Cía*. Suffered a collision but was repaired. [MOBR2776]

1920 on *DOP* work but location unspecified. On hire to *DOP* in 1920 [*EFE memoria* 1920 p323].

1930 under repair at San Eugenio or *Fabrica Copetta* [2] [3].

Tipo 15

4-4-0 d/w 1676mm 66", cyls. 381x609mm 15"x24", built by Baldwin in 1874

103 'SAN ROSENDO' w/n 3530 ex *FCCCiT* no. **17**.

1902-5 Pitrufrquen to Loncoche [2] on hire to Eugene Bobillier [MOBR2012]. Returned to *DOP* in March 1905 [MOBR2012] and was then moved to work on Melipilla to San Antonio route construction [MOBR2012].

Tipo 17

4-4-0 d/w 1422mm 56", cyls. 419x609mm 16½"x24", Santiago workshops, in 1888

76 'SAN BERNARDO'

1911 working for *DOP* but location unknown.

1914 Cajon to Llaima [2] and [MOBR2640].

1916 Púa to Traiguen [MOBR2776].

1920 Possibly working for *DOP*. On hire to *DOP* in 1920 [*EFE memoria* 1920 p323].

4-4-0 d/w 1676mm 66" according to Copeland but 1600mm 63" according to [6], and cyls. 355x609mm 14"x24" or 406x609mm 16"x24" [same sources], built by Rogers in 1861

77 'SAN FERNANDO' w/n 998 ex *FC del Sur* no. **9**.

Used by *DOP* on *FC de Circunvalacion* in 1905 [2]. Confirmed by memo in *ArNAd* file [MOBR1802].

Withdrawn 1917 [30].

Tipo 18

4-4-0 d/w 1676mm 66", cyls. 419x609mm 16½"x24", built by Rogers in 1868

78 'CURICÓ' w/n 1532 ex *FC del Sur* no. **14**, ?

"Loco **78 bis** returned to *DOP* 1932" [3]. Not certain that this is the loco referred to here. Why does it say 'loco **78 bis**'? Was there another loco of that number?

79 'PALMILLA' w/n 1900 ex *FC del Sur* no. **15**.

1910 Melipilla to San Antonio.

1911 working for *DOP* but location unknown.

1912 Alcones to Pichilemu.

1914 El Lingue to Pichilemu.

1920 working for *DOP* but location unspecified. On hire to *DOP* in 1920 [*EFE memoria* 1920 p323].

1930 stored at San Miguel/Los Angeles [2] [3].

Tipo 19

2-6-0 d/w 1422mm 56", **cyls. 432x609mm 17"x24"**, **built by Rogers in 1883**

81 'BENJAMIN VICUÑA MACKENNA' w/n ? ex *FCCCiT* no. ?,

In early 1895 was on construction work north of Temuco [MOBR709].

But from mid 1890s to early 1900s was on the Valdivia to Osorno railway hired to A. Nicolai.

Tipo 19

2-6-0 d/w 1422mm 56", **cyls. 406x609mm 16"x24"**, **built by Rogers in 1883**

89 'LA INDUSTRIA' w/n 3311 ex *FC del Sur* no. **28**,

From mid 1890s to early 1900s was on the Valdivia to Osorno railway hired to A. Nicolai or M. Ossa.

Tipo 25

4-4-0 d/w 1676mm 66", **cyls. 381x609mm**, **built by Rogers in 1871**

99 'BULNES' w/n 1932 ex *FCCCiT* no. 7.

1930 Under *DOP* supervision but stored at San Miguel/Los Angeles [2].

Tipo 31

4-4-0 d/w 1422mm 56", **cyls. 419x609mm 16½"x24"**, **built at Santiago workshops in 1888**

124 'PANGUILEMO'

1904-5 Melipilla to Puangue [MOBR1802].

1910 Melipilla to San Antonio.

1911 shunting at Saboya for Cap. Pastene line works.

1912 Hired, unusually, to contractor Sr. Juan José Buzeta building the *FC Lebu a Los Sauces* which was an independent line and not state owned. Loco hired, 'as is', standing at Maestranza Concepción.

1914 Cajon to Llaima, see [MOBR2640].

1916 Puá to Traiguen [MOBR2776].

1920 still with *DOP* but location unknown [2] [3]. On hire to *DOP* in 1920 [*EFE memoria* 1920 p323].

Tipo 32

4-4-0 d/w 1676mm 66", **cyls. 381x609mm 15"x24"**, **built by Lever Murphy in 1888**

[1] says with 4 axle tenders and weighing 71551kg.

129 'J. WHEELRIGHT'

1930 Loncoche-Villarica branch [3].

130 'MIRAMAR'

1930 Peleco - Puren line [3].

Tipo 21

2-6-0 d/w 1448mm 57", **cyls. 432x609mm 17"x24"**, **built by Vulcan Foundry in 1890**

161 'TRIGAL' w/n 1280

1930 Leased to *DOP* [3]. Back in *EFE* service by 1939.

Tipo 29

0-6-2T d/w 1118mm 44", cyls. 381x609mm 15"x24", built by Baldwin in 1902

These locos were diverted on delivery to the *DOP* where they became nos. **117-9** officially but may have retained their *EFE* number plates.

283 w/n 20211

1902 on Carahue branch. One of the Carahue branch locos, not necessarily of this type, went to the Rucapehuen - Tomé works in August 1907.

190?-1905 Pitrufrquén to Loncoche, on hire to Eugene Bobillier [MOBR2012], but supposedly returned to the *EFE* at the end of that work.

284 ‘CULLINCO’ w/n 20212 [MOBR2640] confirms that ‘**CULLINCO**’ is **284**.

1902 on Carahue branch. One of the Carahue branch locos, not necessarily of this type, went to the Rucapehuen - Tomé works in August 1907.

1910 Alcones to Pichilemu.

1911-12 on Curacautín branch [2]. Named ‘**CULLINCO**’ (which is a location on this line).

‘**CULLINCO**’ was transferred back provisionally to the *EFE* in 1911 [2] for a while.

1913? Cajon to Llaima [MOBR2640] after a period on loan to *EFE*. Given the number **2** in one report at this time [MOBR2640].

285 w/n 20213

1902 Antilhue to Loncoche [2] and [MOBR1496], though possibly first sent with the others to Carahue.

There is a puzzle here. Did these locos return to the *EFE* to become *tipo 29* nos. **117-119**, or did they go to the Coquimbo railway, only returning to the *EFE* after the disuse of the broad gauge there in 1916, eventually becoming *tipo 68* nos. **644-645**. There was still one *tipo 29* in the *EFE* fleet around 1928, perhaps confirming that one of the three did stay in the south when the other pair went to Coquimbo.

Tipo 33

4-4-0 d/w 1422mm 56", cyls. 457x660mm 17½"x24", built by Kitson in 1890

172 ‘COVADONGA’ w/n 3240

1901 Temuco to Carahue [2]. After this it was sent to S. S. Hardie & Co. for overhaul as was in extremely bad condition [MOBR1389]. List of work done is included in file. One of the Carahue branch locos, not necessarily of this type, went to the Rucapehuen - Tomé works in August 1907.

Loco with this number in course of dismantling 1923 [3].

Tipo 38

4-6-0 d/w 1422mm 56", cyls. 457x609mm 18"x24", built by Rogers in 1895

212 w/n 4956 Transferred to *DOP* in Feb 1932 [3]. Not in *EFE* lists 1939, 1941, 1942, or 1951.

258 w/n 5098 Transferred to *DOP* in Feb 1932 [3]. Not in *EFE* lists for 1939, 1941, 1942, or 1951.

Tipo 44

4-4-0 d/w 1676mm 66", cyls. 445x609mm 17½"x24", built by Baldwin in 1895

243 w/n 14468 Transferred to *DOP* in Feb 1932 [3]. Not in *EFE* lists for 1939 or later.

One of these locos was seen hauling an inspection train on the Freire to Cunco branch during its construction in 1923. The number of the loco is unknown but obviously it might have been this one.

Tipo 45 (Baldwin – remolcadora, gradiente excepcional)

(1st & only batch)

2-6-0 d/w 1245mm 50", cyls. 457x609mm 18"x24", built by Rogers in 1900

These were the pair of broad gauge moguls tagged on to the second metre gauge *tipo R* order.

276 'C. HILLMAN' w/n 5654 A loco **276** loaned/leased to *DOP* in 1920, location unknown [3].
On hire to *DOP* in 1920 [*EFE memoria* 1920 p323].

Tipo 49

4-4-0 d/w 1785mm 70¼", cyls. 450x660mm 17¾"x26", built by Balfour Lyon in 1906

Batch of four into service June 06 to Jan 07 [9]. This batch had 3 axle tenders and weight of 78770kg according to [1].

335 'J. LAZCANO'

1930 Transferred/sold to *DOP* and then used on Loncoche to Villarica branch construction [2] [3].

Tipo 57A

2-6-0 d/w 1372mm 54", cyls. 457x609mm 18"x24", built by Hawthorn Leslie in 1912

586 w/n 2901 ex *FC Lebu a Los Sauces* no. **5**. In use on Selva Oscura to Curacautín construction as Nos. **5**. Date uncertain.

587 w/n 2902 ex *FC Lebu a Los Sauces* no. **6**. In use on Selva Oscura to Curacautín construction as Nos. **6**. Date uncertain.

Both later joined the *EFE* fleet as **586** and **587**.

Decreto 1962 of August 5th 1908 authorised the expenditure of \$10,000 on a new boiler and firebox for a loco no. **30**, but it is not certain which engine and on which gauge was referred to. It may have been one of the metre gauge Schneider 4-4-0s in the *Red Sur* fleet.

40° 30° 20° 10° 73°

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YANQUEN

LOMLACOYA

INIHUE

TALCANDIDA

Poso Honda

C° Burro

C° Nulo

C° Pinos

C° Currao

C° Pileo

C° Culebrillo

C° Pichicui

C° Alto

C° Huelmo

C° Quilacauquén

C° Pileo

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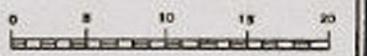
C° Alto

C° Huelmo

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-  FERROCARRILES de la Cia.
-  OTROS FERROCARRILES
-  MINAS de la Cia.
-  OTRAS MINAS
-  FAROS
-  LIMITE PROVINCIAL
-  LIMITE DEPARTAMENTAL

ESCALA: 1:500.000



40° 30° 20° 10° 73°

Buen Retiro

Boca Maule

Estación Arenas Blancas

Yobilo

Puchoco

Coronel

Playa Negra

Playa Blanca

Lota Alto

Chambeque

Lota Bajo

Colcura

Laraquete

FC Coronel i
Buen Retiro
broad gauge

FC Boca Maule
i Puchoco
3' gauge

Puchoco (Rojas)
mines
2' 6" gauge

Puchoco Coal
Co. (later part
of FCBMiP)
4' 6" gauge

FC Arauco
Concepción to
Curanilahue
& Arauco
broad gauge

FC de la Cía.
Carbonífera
e Industrial
de Lota
4' 6" gauge
& 5' 6" gauge

The principal Industrial railways
of Lota and Coronel
based on a 1910 map
by Arturo Titus S.

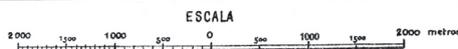
PLANO GENERAL

DEL FERROCARRIL DE LA COMPAÑIA DE ARAUCO (K. 23 & 49)

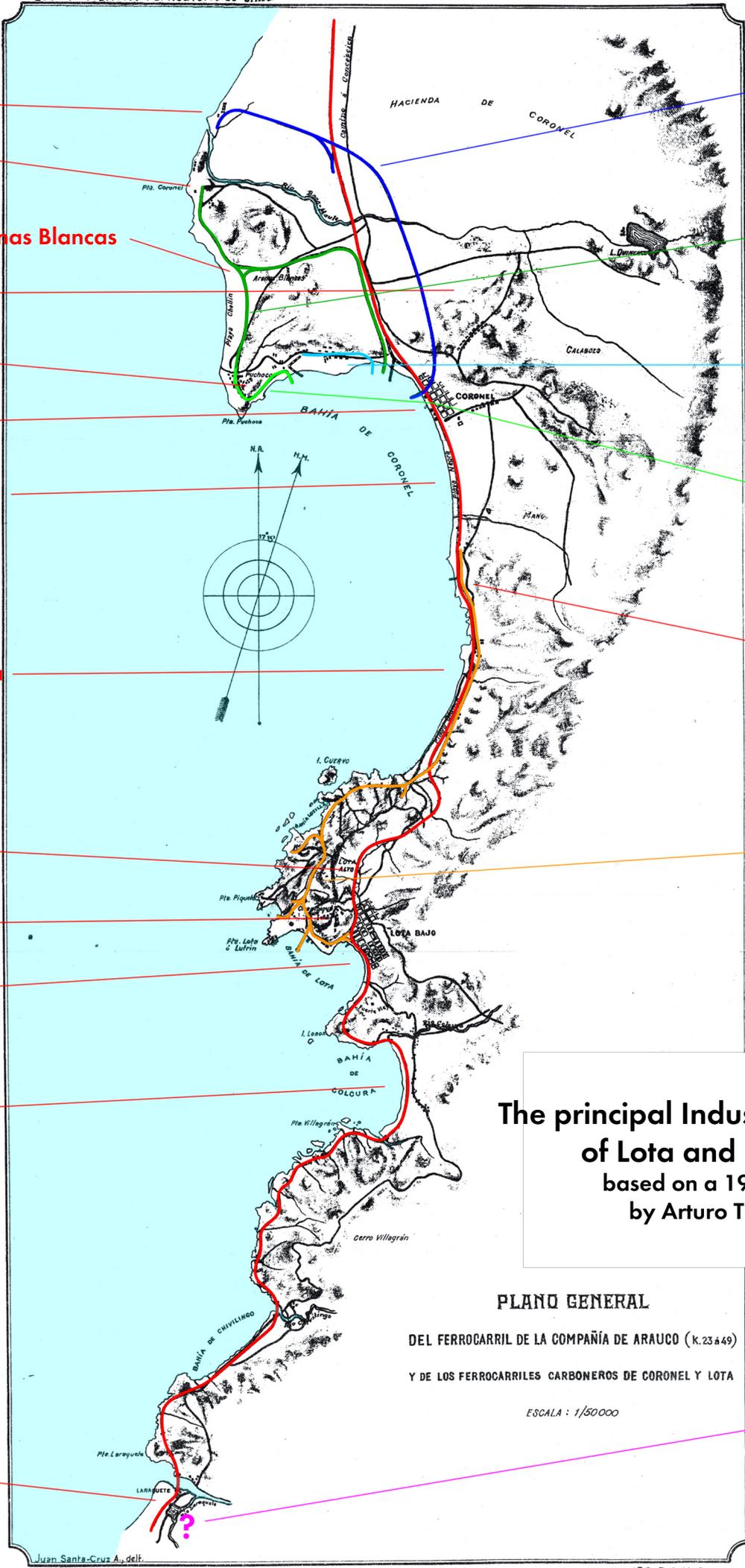
Y DE LOS FERROCARRILES CARBONEROS DE CORONEL Y LOTA

ESCALA : 1/50000

FC de
Laraquete
route uncertain
60cm gauge
Laraquete
south to mines
at Maquegua
& Quilichanquin



ARTURO TITUS S.
Ingeniero Inspector
de Ferrocarriles Particulares.



1.4 Broad gauge coal railways

The Arauco coalfield context

Chile's main coalfield is centred on the Bahía de Arauco south of the city of Concepción. It extends as far north as Lirquen and as far south as Lebu, but the areas of greatest exploitation were at Coronel, Lota and Curanilahue. The coal railways were of various gauges and are thus divided between the four main parts of this work, but in order to facilitate readers' understanding they are all listed here, from north to south:

<i>FC Concepción a Penco</i> (bought by <i>Cía. Carb. de los Ríos de Curanilahue</i> , see below)	5' 6" gauge
<i>FC de Arauco</i> , Curanilahue to Concepción	5' 6" gauge
<i>FC de Coronel a Buen Retiro</i> (owned by the Cousiño family)	5' 6" gauge
<i>FC de Coronel a Boca Maule i Puchoco</i> (owned by the Schwäger family)	3' 0" gauge
The Puchoco Coal Co. (Délano's line, later merged into the above system and regauged?)	4' 6" gauge
Puchoco Rojas mines north-west of Coronel	2' 6" gauge
<i>FC de la Compañía Explotadora de Lota y Coronel</i> (Cousiño family)	4' 6" gauge
<i>FC de Laraquete a Quilachanquin i Maquegua</i>	75 or 60 cm gauge
<i>FC de Jañes (or Caleta Yane) a Huena Piden</i>	Metre gauge
<i>FC de Peumo a Quilachanquin</i> of the <i>Cía. Carbonífera de Carampangue</i>	2' 6" gauge
The proposed <i>FC de Curanilahue a Puerto Yane</i>	Metre gauge
<i>La Cía. Carbonífera de los Ríos de Curanilahue</i>	5' 6" gauge
Mina Pilpilco, at Los Alamos	60cm gauge
Millaneco mines to north bank of río Lebu	narrow gauge
<i>FC Los Alamos a Trihueco</i>	60cm gauge?
<i>La Cía. Carbonífera Victoria</i> , and <i>la Cía. Nacional Carbonífera</i> , at Lebu	60cm gauge
<i>La Cía. Carbonífera de Lebu</i> , from Boca Lebu up to the pique Santa Amalia	gauge unknown
<i>FC Lebu a Los Sauces</i> (Chilian Eastern Central Railway Co. Ltd.)	5' 6" gauge

The first two of these, and the last, were common carrier lines with passenger trains and a range of freights, but the remainder were wholly devoted to the coal industry and its workers. Whilst this list includes all known longer distance railways on the coalfield, inevitably there will have been many internal mine systems not yet discovered, some of which will have used steam locomotives.

Coal mine railways elsewhere

There are mines further down toward Valdivia, including those at Mafíl which had a 60cm gauge railway system. One thousand miles further south there are also a variety of coal and lignite deposits down in Magallanes. In particular, the railway up the Rio de las Minas from Punta Arenas to the site eventually known as the Mina Loreto gets two mentions here – in its original 3' 6" gauge guise (in section 2.4.6) and later when rebuilt to metre gauge (in section 3.4.2).

1.4.1 *El FC de Arauco,* after a take-over sometimes known as the *FC Ríos de Curanilahue* or the *FC de Concepción a Curanilahue*

1886-1957



The Arauco Railway Company crest, as displayed on the side of their carriages.

Background

Broad gauge. 91 km from Curanilahue north via Lota and Coronel to Concepción. Concession granted to Sr. Gustavo Lenz on 23rd October 1884, and then transferred to London-based Arauco Co. Ltd. Construction began 1886. San Pedro to Coronel opened 24th December 1888, extended to Lota and between Laraquete and Carampangue in September 1889, finally whole route open from April 1890. A branch to Arauco was opened in April 1891. The company owned and worked mines around Colico and Curanilahue, and eventually included a short mine branch at Colico and an extension to the mina Plegarias three miles south of Curanilahue. It became part of J. T. North's empire. It was sold in 1919 to the *Cía. de los Ríos de Curanilahue* (which see below), and shortly afterward came into the ownership of the *Cía. Carbonífera e Industrial de Lota*. The railway was operated by the *EFE* after 1957.

Incidentally, the Arauco railway suffered a serious collision in 1926 when a broken down passenger train near Lota was hit by the relief train sent to aid it. Ten were killed and 20 injured but no details are known of damage to the locos [Daily Heralds, UK, 30 December 1926].

Couplings

It looks as though the Arauco locomotives used chopper couplings initially, in contrast to the *Ríos de Curanilahue* company whose locos (rather later) had European side buffers like those on the *EFE*.

0-4-0ST d/w 840mm 33", cyls. 229x256mm? 9x10"?, built by Fowler in 1887

(Fowler records say cyls. 9x14", as do [13] and [14]). [26] suggests these were originally numbered **4-5**.

1 'SAN PEDRO'	w/n 5496	Despatched 15-10-1887. HT list has this as no. 4 .
2 'SAN JOSÉ'	w/n 5497	Despatched 17-10-1887. HT list has this as no. 5 .

0-6-2ST d/w 1020mm, cyls. 15x22" 381x559mm, built by Fowler in 1887 and 1889

[13] says built 1888. [26] suggests the first three of these were originally numbered **1-3** in build order. Replacement Fowler boiler (9871) for one supplied in March 1904, and others in February 1908 (11497), January 1911 (12770), June 1913 (13901), and January 1920 (15540).

3 'CORONEL'	w/n 5327	Despatched 31-3-1887. HT list has this as no. 2 .
4 'ARAUCO'	w/n 5326	Despatched 31-3-1887. HT list has this as no. 1 .

5 'LAUTARO'

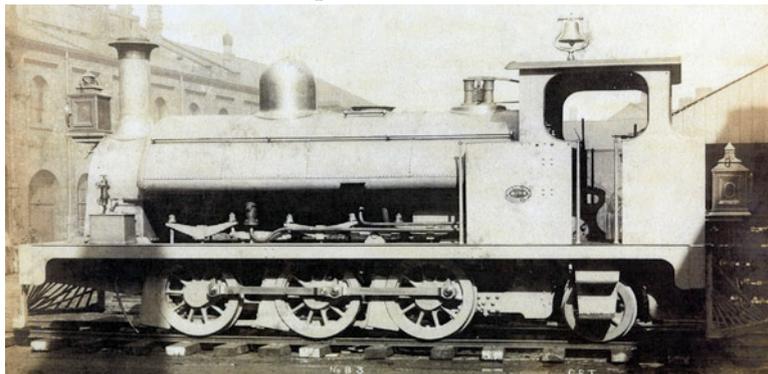
w/n 5328

Despatched 30-4-1887. Originally named 'CONCEPCIÓN' HT list has this as no. 3.

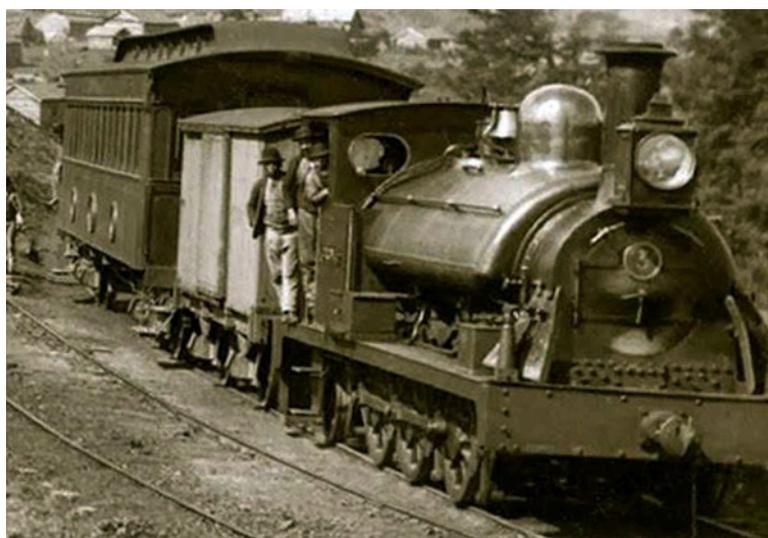
6 'LOTA'

w/n 5953

Despatched 19-6-1889.



Fowler builder's pic available at the Museum of English Rural Life, Reading.



Robert Stephenson 0-6-2ST no. 3 'CORONEL' at Mina Colico.

A Fowler boiler

Fowler supplied 16hp loco boiler no. 5833 to the Arauco company, despatched 15-9-1888. It seems unlikely that any of the locos listed above would have needed a replacement boiler so soon after their construction, and 16hp seems quite small. Possibly it was for a road locomotive or a *locomovil*.

0-6-0ST d/w 920mm, cyls. various see notes for each loco. built by Manning Wardle in 1889

7 'LARAQUETE'

w/n 1124

Cyls. 305x432mm. New boiler supplied 1914.

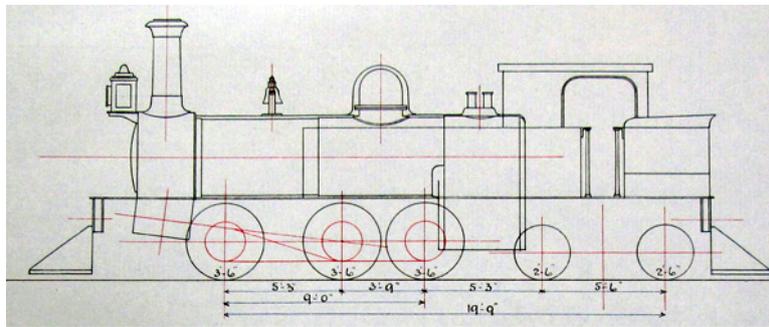
8 'COLCURA'

w/n 1125

Cyls. 305x432mm. New boiler supplied 1916.

Proposed 0-6-4T design

A sketch drawing (S138) in the NBL records in Glasgow implies that an 0-6-4T design was being worked up by Dübs or Neilson for the Arauco Railway in 1889, presumably in response to an enquiry or invitation to tender.



2-6-4T d/w 1070mm 42", cyls. 381x559mm 15x22", built by R. Stephenson from 1889 onward

Build dates were 1889 (9-12), 1900 (14), 1906 (16), 1907 (17-8) 1908 (20 and 22), and 1912 (23 and 24). Later locos had larger sandboxes according to the RS weights book at the NRM in York.

9 'CAÑETE'	w/n 2685
10 'BIO-BIO'	w/n 2686
11 'COLICO'	w/n 2687
12 'CONCEPCIÓN'	w/n 2688
14 'PEUMO'	w/n 3047
16 'ROBERTO'	w/n 3211
17 'LEPEL'	w/n 3257
18 'GRIFFIN'	w/n 3282
20 'PRESIDENTE MONTT'	w/n 3350
22 'DOMINGO GANA'	w/n 3362
23 'AGUSTIN EDWARDS'	w/n 3500
24 'PRESIDENTE LUCO'	w/n 3501

Replacement boilers supplied by John Fowler in 1908 and 1913 for "15 inch locos" may have been for these engines. Robert Stephenson also supplied one new boiler in 1900. A poor photo showing one of these locos on a train in Coronel station suggests that at some point some or all Arauco locos were fitted with short vestigial side buffers, probably in order to improve compatibility with *EFE* stock whilst not preventing the operation of their own chopper couplings. This was very possibly before the *EFE* began the change to knuckle couplers or else the alternative of fitting a single fully functional side buffer would no doubt have occurred to the management.

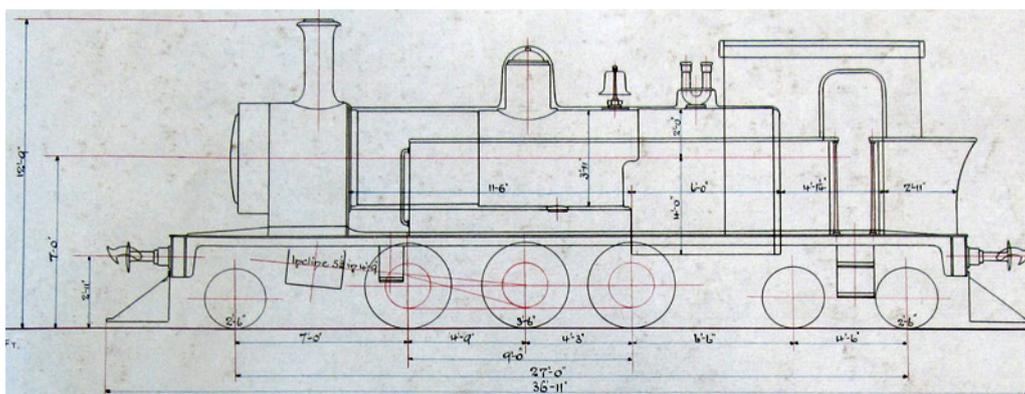
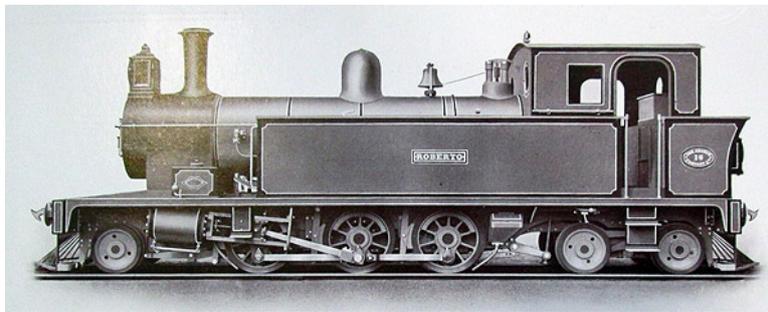


Diagram from the P. C. Dewhurst collection at the NRM in York.



No. 12 'ROBERTO' as depicted in a Robert Stephenson catalogue.



This loco would appear to have a rather taller chimney than that in the photo above.

0-6-2T or 2-6-0T? or possibly 0-6-0T d/w 760mm (30"), cyls. 263x356mm (10.35x14"), built by Henschel(?) in 1874

One source says built with stroke 365mm (14.37" but unlikely). It seems very doubtful that this loco was built by Henschel despite [13] clearly stating that. The dimensions of the driving and carrying wheels are imperial. Jens Merte's Henschel list suggests they they built no broad gauge locos until 1888, and no 2-6-0 or 0-6-2 locos for anywhere apart from Italy until 1895. Alternatively this loco may have been narrow gauge, possibly 2' 6", like the Manning Wardles that follow. After all, 30" is a very small diameter for driving wheels on the broad gauge. However, the Henschel list still contains no suitable candidates built around 1874. The engine may have been second-hand if it was indeed built in 1874, as it clearly joined this railway after locos **6-12** built in 1889 and before no. **14** built in 1900.

13 'ADELINA' w/n ?

0-4-0ST d/w built as 30 or 31" but recorded as 0.92m or approx. 36" in 1910, cyls. 7x12", built by Manning Wardle in 1874 (21), 1883 (15), and 1885 (23)

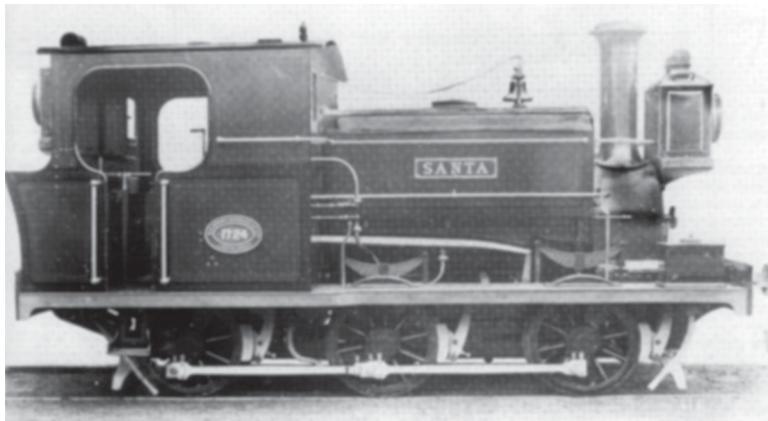
All three works numbers listed below were built as 2' 6" gauge. They all seem to have gone to Chile. They must have joined the Arauco fleet around 1900, and were then perhaps rebuilt to broad gauge, though it is possible that the *FC de Arauco* had a narrow gauge network maybe at a mine and numbered the locos within the main broad gauge sequence. Note also that these four engines, these three and no. **13** above, all had girls' names, unlike most other Arauco locos. This also tends to point towards a small self-contained narrow gauge fleet. The identification of these locos relies on the fact that both '**ROSITA**' and '**ELVIRA**' were constructed with those names, though the MW list only states that they were built for Chas. Cowan and Rose Innes of Birkenhead respectively. The latter was certainly an agent working in Chile. 497 on the other hand had definitely been delivered via Bates Stokes & Co. of Valparaiso.

15 'ROSITA'	w/n 877	Presumably rebuilt and numbered in this series after 1900.
21 'MARÍTA'	w/n 497	Presumably rebuilt and numbered in this series around 1908.
23 'ELVIRA'	w/n 954	Presumably rebuilt and numbered in this series after 1908, but what happened when RS 2-6-4T no. 23 was delivered in 1912?

0-6-0ST d/w 920mm, cyls. 305x321mm, built by Manning Wardle in 1907 (19) and 1912 (25)

These were ordered for the Arauco Co. Source [13] says the cyl. stroke was 432mm.

19 'SANTA'	w/n 1724	New boiler supplied 1921.
25 'ARNALDO REID'	w/n 1797	MW list says 'ARNALDO REIS' but Arnold Reid was the General Manager of the Arauco Company so it is safe to assume the nameplate showed some variant of that.



MW builder's pic, via Fred Harman's books.



One of these two engines, probably the second judging by the length of the nameplate, on the big wooden trestle viaduct at Colico.

0-4-0 d/w ?, cyls. ? built by Baldwin in 1908

Nothing is known of this loco. However, if it did indeed gain the number 8, then the previous number 8 must have been out of service by then.

8 w/n ?

2-6-2T d/w 1067mm 42", 381x559mm, built by Baldwin in 1917

BLW no. 10 24¼D 116, spec is in vol 54 p 368.

26 'PRESIDENTE SANFUENTES' w/n 45915

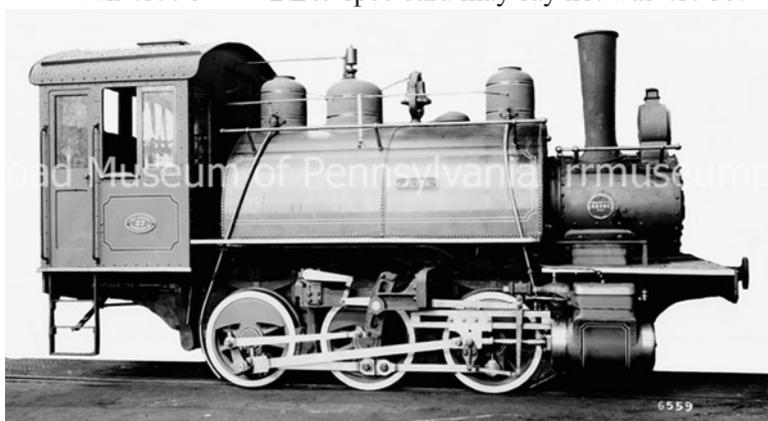


BLW archive pic; hi-res versions available from Railroad Museum of Pennsylvania.

0-6-0ST d/w 914mm 36", cyls. 305x321mm, built by Baldwin in 1917

BLW no. 6 18 D 46, spec is in vol 54 p 368 (or 371?).

27 'ALIDA' w/n 45996 BLW spec card may say no. was 45986.



BLW archive pic; hi-res versions available from Railroad Museum of Pennsylvania.

Ex EFE tipo 33

4-4-0 d/w 1422mm, cyls. 457x660mm, built by Kitson for the EFE in 1890

Purchased by *FC de Arauco* at an unknown date, but certainly these locos left *EFE* stock before 1908.

? w/n 3233 Ex-*EFE* no. **165 'SANTA FÉ'**

? w/n 3238 Ex-*EFE* no. **170 'CHILOÉ'**

The fleet in 1909-1911

The government annual publications *Estadística de los Ferrocarriles Particulares en Explotación* state that the railway in 1909 to 1911 had twenty-two locos in operation, nineteen for goods trains and three for shunting.

Source [13] lists 23 tank locos owned in 1909.

Changing ownership

In 1919 the *FC de Arauco* was purchased by the *Cía. Carbonífera de los Ríos de Curanilahue*, and their locomotives (see section 1.4.4) which already ran on the Arauco tracks will have been merged into a single combined fleet. So far the overall numbering system is not clear though photos do show that Curanilahue locos did gain numbers.

A year or so later the Curanilahue company was itself purchased by the *Cía. de Lota y Coronel*, which renamed itself as the *Cía. Minera e Industrial de Chile*, and in 1933 the business was re-designated as the *Cía. Carbonífera e Industrial de Lota*. Whilst these changes had brought the Arauco railway under the same ownership as the Lota coal mines (see sections 1.4.6 and 2.2.1) they remain in separate sections here as their nature was very different.

The 1930 US report states that 34 locos were in service on the Arauco railway. This will have included engines originally owned by the *Los Ríos de Curanilahue* company as well as possibly some at the Lota and Buen Retiro mines.

There are 28 locos listed above for the *FC de Arauco*, though the three/four narrow gauge engines can possibly be dis-

counted. Then there were six owned by the *Los Ríos de Curanilahue* company, and at least three (of broad gauge) and ten (of 4' 6" gauge) that had been purchased for the Buen Retiro and Lota Mines railways since 1870. That does indeed make a total close to 34 for broad gauge engines.

Thirty years or more without new locos?

So far no trace of any new locos purchased during the 1920s, '30s and '40s has been found, though a couple of ex *EFE* second-hand engines are listed below. Any evidence that new locos were acquired would be much appreciated.

Further purchases from the *EFE*

A 1951 *EFE* fleet list states that two locomotives had been sold in recent years to the *Cía. Lota*, which of course by then owned the *FC de Arauco*. These were:

Tipo 38 (de carga, pesados) (1st batch +)

4-6-0 d/w 1422mm 56", cyls. 457x609mm 18"x24", built by Rogers in 1893

213 w/n 4957 Withdrawn from *EFE* 1947. Sold at that time to *Cía. Carbónifera de Lota*, for Mina Plegarias?

Tipo 57A (1st & only batch)

2-6-0 d/w 1372mm 54", cyls. 457x609mm 18"x24", built by Hawthorn Leslie in 1912

Built for the Chilian Eastern Central Railway Co. (Lebu to Los Sauces Railway). Acquired by the *EFE* along with that railway in 1942.

587 w/n 2902 ex *FC Lebu a Los Sauces* no. **6**. Sold 1950 to the *Cía. Carbonifera de Lota*.

The fleet in 1952

A history of the Lota company published in 1952 [*Cien Años del Carbón de Lota*] states that twenty-six locomotives were in service. A film celebrating 100 years of the coal industry and thus probably dating from about the same time is available at <https://www.youtube.com/watch?v=AjGoZ4HAX30> It shows, amongst other scenes, a mainline coal train topped and tailed by the ex Lebu to Los Sauces Hawthorn Leslie 2-6-0, one of the ex Ríos de Curanilahue Borsig 2-6-0s and a US-built tender loco probably ex *EFE* tipo 38 no. **213** as listed above.

2-6-2 d/w ?, cyls. ?, built by Mitsubishi in 1953

Robin Gibbons provided this information from 'Okita's lists': "It says (the customer was) チリ鉱山 which I think translates as Chile Mines or Mining." The evidence that these locos arrived here is so far confined to the lack of any plausible alternative and to a film clip from 1965 showing a sizeable tender loco at Lota. This is available at <https://www.youtube.com/watch?v=02Dbyf0dOqg> A still from this is displayed below. Incidentally these must have been under construction, probably at Mitsubishi's Mihara works, at the same time as the final batch of *EFE* tipo 80 4-8-2s. The latter were Mitsubishi numbers 741 to 776. NB For some unknown reason these 2-6-2s are missing from the Mitsubishi list in SLS library file WL8754, which merely has a gap between locos 781 and 785. On the other hand file WL7726 does show these locos but has them down as for the Chilean State Railways.

? w/n 783 Close examination of the film clip suggests that one of these locos
? w/n 784 may have been numbered **55**, but this is by no means certain.



This substantial and previously unsuspected tender engine, at first guess a 2-6-2 or 2-8-2, is seen at minute 10.22 to 10.34 in the film clip mentioned. It is of generally US outline, though with a British type smokebox door and a capped chimney. The modern cylinder blocks, with long valve chests and thus straight ports, do suggest that it was of up-to-date design. Rhys Owen also points out that the snifting valve on the outside of the block was typical of later Japanese designs, as were the cab spectacle sun-visors. Also, the sharp bend at the top outer edge of the cylinder blocks, rather than a larger radius curve, is reminiscent of late Japanese designs which often have the block continuing right up to the running plate..

Takeover by the *EFE* and the fate of the loco fleet

Operation of the *FC de Arauco* was taken over by the *EFE* in 1957, but other activities of the owning company continued as before until 1964 when mining operations at Lota joined with the much more fragile Schwäger business at Coronel to create a combined *Cía. Carbonífera Lota Schwager S.A.* In 1970 a majority of the shares were taken by *CORFO*, a government holding company, and eventually the mines were spun out into *ENACAR*. By 1997 mining had ceased.

It is not clear what happened to the Arauco loco fleet when operation of the line was nationalised. It may well be that older Arauco locos were immediately withdrawn in favour of the *EFE*'s standard classes. However, the film clip mentioned above, that includes views of one of the Mitsubishi 2-6-2s at the Lota washery, was created in 1965. This suggests that at least a few of the younger locos may have survived for several more years, probably still in the ownership of the Lota company.

Baldwin drawings

The collection of Baldwin drawings at the deGolyer Library, Southern Methodist University, includes side elevation (SE) or cross section (CS) drawings for one design built for the Arauco Company.

Index#	DWG#	Tracing#	Road name	Road#	Date	Baldwin class	Number	Wheel	Dwg typ	Size
167-14X	9162	-	Arauco Company Ltd.	26	1917	10-24 1/4 D	116	2-6-2	SE	26 X 62
167-14AX	9163	-	Arauco Company Ltd.	26	1917	10-24 1/4 D	116	2-6-2	CS	

The list of drawings in which these details were found is at <https://www.smu.edu/~media/Site/Libraries/degolyer/pdfs/BLW-EDWG-RoadName.pdf> whilst arrangements to purchase copies can be found at <https://www.smu.edu/libraries/degolyer/Research/Permissions>.

1.4.2 *El FC de Coronel a Buen Retiro*

1887-?

Background

This was a broad gauge coal mining railway, plans approved 1887, completed 1890. It was built by the *Cía. Explotadora de Lota i Coronel* – a Cousiño company – and still owned by the successor company in 1910. This owner went through several transformations, eventually becoming the *Cía. Carbonifera e Industrial de Lota*. The line ran from a point on the coast north of Boca Maule, ESE to interchange sidings with the Arauco railway, then across that line and turned SSE to run down to Coronel just south of the Arauco railway's station. The total length was 6 km. It crossed the Arauco railway at Km 24. However, a description of the proposed route, written by don Benjamin Squella, the Administrator of the *Cía. Explotadora de Lota y Coronel*, in December 1887, states that the gauge was to be 1.37m ie. the 4' 6" gauge of the company's railway system in Lota [MOBR172]. At the time of writing it is not known whether the railway was built to that gauge and later re-gauged to 5' 6", or whether more probably the government had required the gauge to be 5' 6" as a condition for the concession to be granted.

A 1909 source [59] conflicts on gauge with the above, saying "The boxes are brought from the working-faces on an in-bye station by horses, and thence conveyed to the pit-bottom by haulage engines operated by steam. At the surface they are tipped into 6-ton cars, and conveyed over a 36 inch gauge railway in trips of eight at a time. This railway is 3¼ miles (6 kilometres) long, and, after passing over the main line of the Arauco Company from Curanilahue to Concepcion, goes through a 886-foot (270-metre) tunnel under Coronel town; the terminus is a pier 476 feet (145 metres) long, where the cars are discharged over shoots into barges." Much of this sounds accurate and it may be that only the gauge was recorded falsely, perhaps owing to confusion with the nearby Schwäger mines which did use the 3' 0" gauge.

Couplings

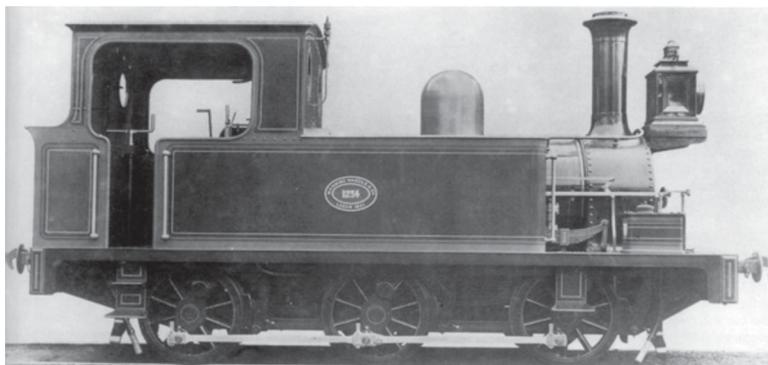
The chopper couplings of the locos listed below, would of course have made them compatible with the stock of the *FC de Arauco*, with which this railway connected.

0-6-0T d/w 36", cyls. 12"x18", built by Manning Wardle in 1891

'BUEN RETIRO'

w/n 1234

With cut down cab for tunnel work, though this is not clear in photo.
Last spares sent in 1920.



MW builder's pic.

0-6-0ST d/w 36"?, cyls. 11"x16", built by Manning Wardle in 1892

'LA REVOLUCIÓN'

w/n 1253

With cut down cab for tunnel work. Side buffers with central chopper coupling, though the side buffers are not shown in the photo.
New boiler sent out 1921.



MW builder's pic, via Fred Harman's books.

Two locos in use early in the new century

“Las locomotoras en servicio son dos, de 8 a 10 toneladas de peso, con dos ejes acoplados. Arrastran 8 carros con capacidad de seis toneladas cada uno; los carros vacios pesan cerca de 4,000 kilos cada uno.” [56]

Supposedly this railway had two Manning Wardle 0-6-0Ts in 1910. These were presumably the two listed above.

One more MW broad gauge loco went to Coronel some years later. Its characteristics make it seem likely that it was for the same railway:

0-6-0T d/w 36", cyls. 13"x18", built by Manning Wardle in 1920

‘YOBILLO’

w/n 1983

With cut down cab for tunnel work. Side buffers with central chopper coupling. Yobilo is a location north east of Coronel where the mining rights were also owned by the *Cía. Carbonifera e Industrial de Lota*. The railway ran through the Yobilo area on its way to Coronel and may have served mines *en route*.

For the later history of this loco, see section 1.4.6 on the Lota coal mines.



MW builder's pic, via Fred Harman's MW books. The side buffers would have been compatible with *EFE* wagons working over the Arauco railway.

1.4.3 *El FC a Lirquen* otherwise known as the *FC Concepción a Penco*

1888-1925

Background

Broad gauge. Plans approved 1885/8. Constructed 1888-1892 as far as Penco, and permission to extend to the coal mines at Lirquen was granted in 1904. Government investment eventually permitted an extension to meet the *EFE* branch from Rucapequen at Tomé. The railway was acquired in 1906 by the *Cía. de los Ríos de Curanilahue*, but transferred to the *EFE* in 1925 so that the through route from Rucapequen to Concepción would be under single control.

0-4-0WT, d/w approx 1000mm, cyls. 14x24", built by Henschel in 1888

These locos were supplied via J. C. Schuchard of Bremen and Gebr. Vorwerk for Chile. They weighed 16 tonnes [13 and MOBR1012]. In 1905 and 1906 Henschel supplied new boilers to Chile via Gebr. Vorwerk & Co., the second being specifically for the '*Penco-bahn*'.

? 'CONCEPCION'	w/n 2682	Not certain which loco was named 'CONCEPCION',
? 'PENCO'	w/n 2683	and which was named 'PENCO'

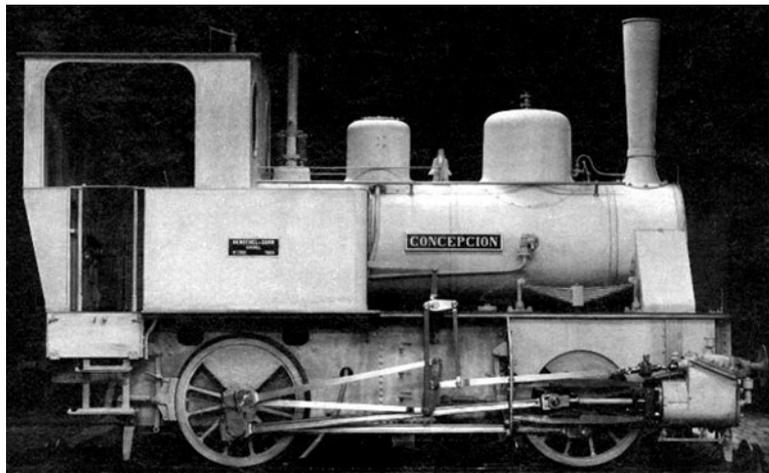
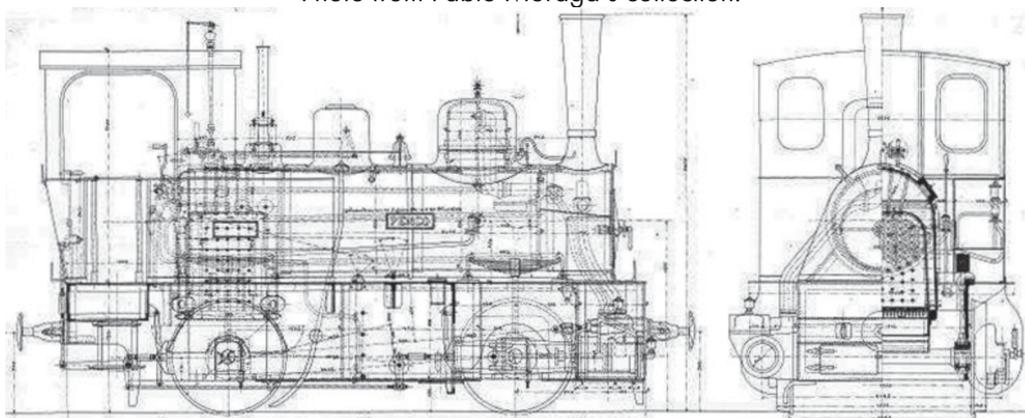


Photo from Pablo Moraga's collection.



Drawing is available from <https://www.henschel-museum.com/>

2-6-2T d/w 50" cyls. 16x24", built by Lima in 1907-8

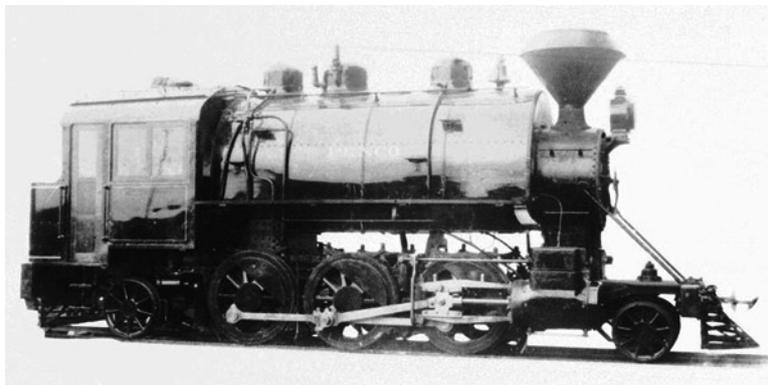
These were built for the *Cía Carb. de los Ríos de Curanilahue* via W. H. Crossman & Co., and were very probably intended for use on this railway. Shipment from Ohio was on January 8th 1908. The purchaser information was confirmed by a Lima letter and notes to P. C. Dewhurst in 1925. They must have been sold to the *EFE*, probably on arrival in Chile, and may never have entered service on the Penco line. This sale of new locos to the *EFE* was by no

means the only one from a private company, driven at a guess by a cash flow problem. Note that these locos were built with chopper couplings, as used by the *FC de Arauco* (with which this route connected), but not with the *EFE*-style side buffers that later *CCRC* engines possessed.

‘**PENCO**’ w/n 1065

‘**CURANILAHUE**’ w/n 1066

They became *EFE tipo 34*, with running numbers **165** and **170**. See *EFE* section for later history.



The fleet in 1909-1911

The government annual publications *Estadística de los Ferrocarriles Particulares en Explotación* state that the railway had two locos in operation, one for goods trains and one for shunting.

However, the fact that one of the 1907 Lima 2-6-2Ts was to have been named ‘**PENCO**’ suggests either that the second of the original Henschels had borne some other name, contrary to the speculation on the previous page, or that it had been withdrawn from service by that date.

An *MIOP* letter of 27th July 1911 [MOBR2418] then discusses a problem with accessing the *FC de Penco* [sic] via the *punte Andalion* (nowadays *Andalien*), presumably owing to worries about its strength. The *Puente Andalien* is on the north side of Concepción, crossing the *Río Andalien en route* to Penco and Tomé. The writer was keen that the bridge be reopened as soon as possible for locomotives of *el tipo Rosario...* **142 ‘ROSARÍO’** was an *EFE tipo 21* 2-6-0 built by Lever Murphy in 1888. Whether this means that such locos were used by the *EFE* on the *FC Concepción a Penco*’s metals, or that this loco had been hired to the Penco railway, is not known.

Source [23] says this line had three locos in 1916.

Later locos

Of course from 1906 the railway had been owned by the *Rios de Curanilahue* company (see immediately below) but it was only in 1909 that this company began buying locos for operation from its coal mines further south, and only in 1919-20 that the whole route through from Curanilahue to Penco came under single management. It is quite possible that during the following five years, until the *EFE* took over the route to Penco and Tomé in 1925, that other *Rios de Curanilahue* locos or indeed some from the ex-*FC de Arauco* fleet might have been used here.

1.4.4 *La Cía. Carbonífera de Los Ríos de Curanilahue*

Background

Broad gauge. This was a coal company, owning substantial mining assets based on the Los Ríos estate close to Curanilahue, in particular the group of three collieries to the west of the town, mina Laurela, mina Nivel and mina Chiflon. From 1906 it also owned the Concepción to Penco railway (which see above). It had originally planned to build a metre gauge railway west to Caleta Yane (see metre gauge locos file), to bypass the inadequate broad gauge *FC de Arauco* (see below). After that scheme had been abandoned the company purchased several broad gauge tender engines. These were larger than any of the locos owned by the Arauco railway and it seems probable that they were for haulage of *CCRC* trains over that line.

The company eventually took over the *FC Arauco*, see above, in 1919 when the loco fleets were merged. In January 1920 the combined outfit was bought by the *Cía. Carbonífera e Industrial de Lota*, and in November of that year the operations were merged with those of the Lota company. The Los Ríos estate had been purchased by Matias Cousiño with a view to its afforestation to produce pit-props for the mines at Lota, so there may have been a financial link with the Lota company long before 1920.

2-6-0 d/w 1422mm 56", cyls. 432x609mm 17"x24", built by Baldwin as dated below

BLW nos. 8 28 D 282, 283 and 305-6, spec is in vol 44 p 194, and later ones in vol 34 p369 (strangely) and vol 49 p175. Specs say clearly that no numbers were to be displayed. Fitted with le Chatelier counter-pressure brakes.

Builder's photo and spec suggests first two supplied with six-wheeled tenders. Similar to *EFE* moguls of *tipo 55* but with smaller boilers to keep weight down on light track. Erecting card drawing for '**LAURELA**' is 474A-13 in DeGolyer Library collection.

'**LAURELA**' w/n 33858 built 1909 6-wheeled tender. PMT says this became no. **25** after the merger. The mina Laurela, a kilometre or so south-west of Curanilahue station was one of a group owned by this company.

'**RAFAEL ERRÁZURIZ ECHAUREN**' w/n 34795 built 1910 6-wheeled tender.

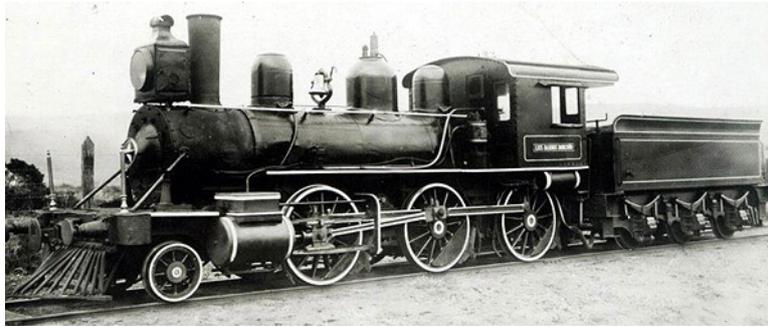
'**QUILACHANQUIN**' w/n 40955 built 1913 Provided with 8-wheeled tender. Possibly later no. **27**.

'**LEBU**' w/n 40956 built 1913. Provided with 8-wheeled tender.

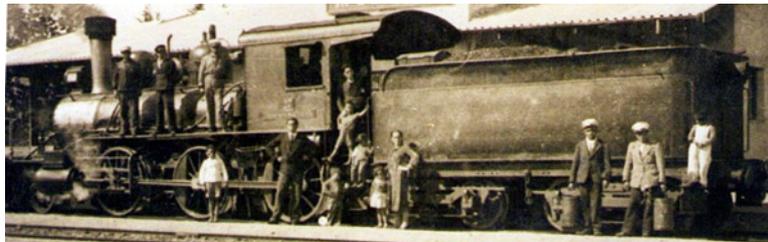
It is believed that one or more of the Baldwin 2-6-0s were renamed, as pictures taken around 1927 exist of one with the name '**LUIS BARROS BORGOÑO**'. After the merger these locomotives may have been numbered. A brief and very poor film clip shows an American-built tender loco crossing the Bio-Bio bridge with a front number plate showing **?5**, and a still photo seems to show one at Curanilahue bearing the number **25**.



BLW builder's pic of '**LAURELA**'. High res versions are available from the Railroad Museum of Pennsylvania.



'LUIS BARROS BORGOÑO' in 1927 possibly immediately after its renaming, source unknown.



This image at Bio-Bio station shows the later loco no. **27** with its larger eight-wheeled tender.

The name-plate, whilst illegible, appears to be very long, suggesting that this loco too might have been renamed. Paradero Bio-Bio lies on the ex *FC de Arauco* route just west of San Pedro and only 5 km from Concepción.

2-6-0 d/w ?, cyls. ?, built by Borsig in 1911

Exported via Schumacher & Wulff for the *Comp. Carbonifera Rios de Curanilahue*.

'RAMÓN RABAL' w/n 8089 Named after the entrepreneur who acquired the company in 1890 and initiated the growth of mining in Curanilahue.

? w/n 8090



Borsig builder's pic, Jens Schindler collection.

Baldwin drawings

The collection of Baldwin drawings at the deGolyer Library, Southern Methodist University, includes side elevation (SE) or cross section (CS) drawings for one design built for the *Cía. Carb. de los Ríos de Curanilahue*.

Index#	DWG#	Tracing#	Road name	Road#	Date	Baldwin class	Number	Wheel	Dwg typ	Size
474A-13	6522		Cía. Carb. de los R de C 'Laurela'		1909	08-28 D	282	2-6-0	SE/CS	3

The list of drawings in which these details were found is at <https://www.smu.edu/~media/Site/Libraries/deGolyer/pdfs/BLW-EDWG-RoadName.pdf> whilst arrangements to purchase copies can be found at <https://www.smu.edu/libraries/deGolyer/Research/Permissions>.

1.4.5 *El FC Lebu a Los Sauces*

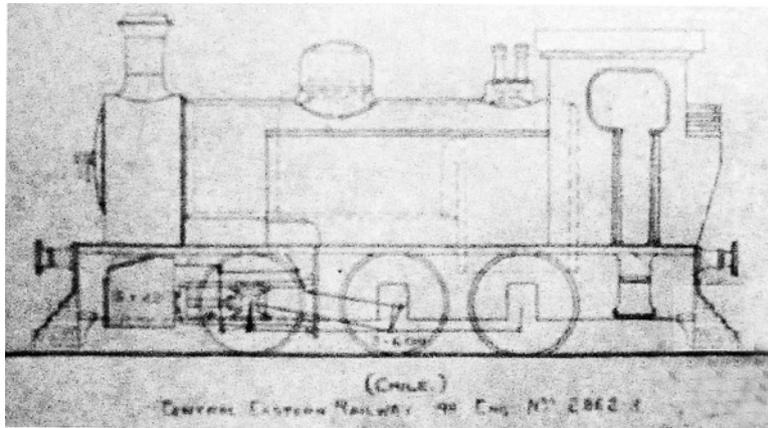
Background

A concession was obtained in 1908, and transferred to the Chilian Eastern Central Railway Company Ltd in 1910 [8]. This went bust in 1915, and was taken over by the Lebu Coal Co. Peleco to Puren was expensive to build and was not completed until after the Los Sauces to Puren section was taken over by the *EFE* in 1928. The whole line became part of the *EFE* in 1939.

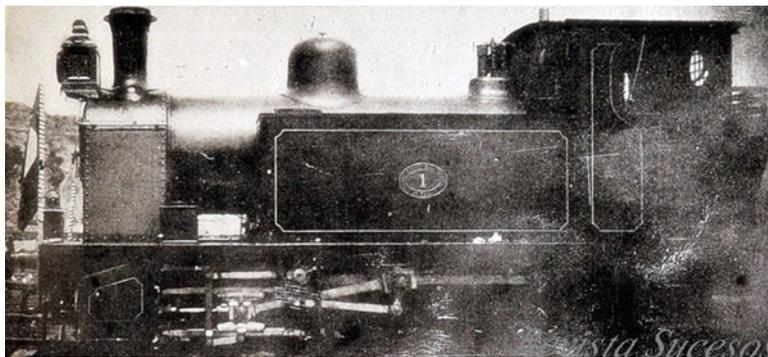
0-6-0T d/w 42", cyls. 15x22", 30 tonnes [17], built by Hawthorn Leslie in 1911

Ordered via Secretan & Co. for Central Eastern Chili, on 31st October 1910. Delivered 3rd February 1911. To carry number-plates as seen below, with 'FERRO CARRIL ESTE CENTRAL DE CHILE' around edge.

- | | | |
|---|----------|--|
| 1 | w/n 2862 | Later became <i>EFE 650-1</i> of <i>tipo 56A</i> . |
| 2 | w/n 2863 | Later became <i>EFE 650-1</i> of <i>tipo 56A</i> . |



From a batch of Hawthorn sketches in the P. C. Dewhurst archive at the NRM. Accuracy not guaranteed; the boiler mountings in particular appear rather too heavy when compared with the photo below.



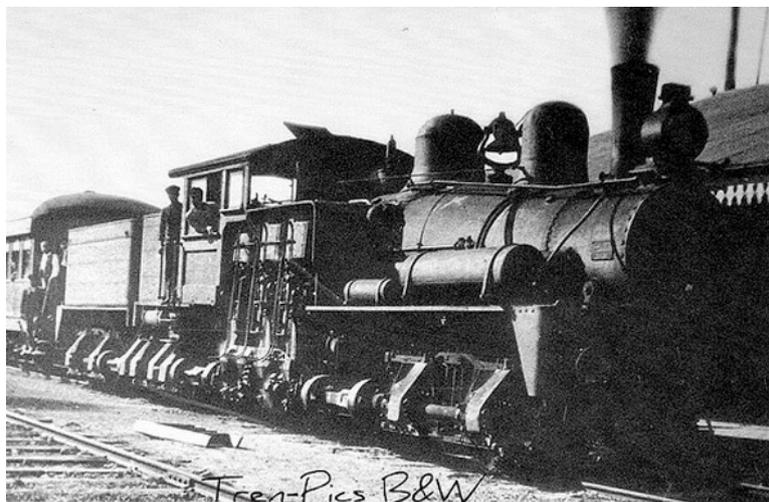
Loco no. **1** is seen in as new condition with capped chimney and with side buffers, and without the turbo-generator, sand-dome, air-pump, and cabside sun-visors that had been fitted by the time they were in *EFE* service. Photo from *Sucesos* magazine.

Rack locos never built

NBL records held in Glasgow suggest that an enquiry had been received around 1911 for the supply of one or more 0-8-2T Abt rack locos for the Chilian Eastern Central Railway, implying that the purchase of the Shays, below, for the steep climb out of Lebu may have been a second-best option forced on the railway by a shortage of funds.

0-4-4-4-0 three truck Shay, 85 tonnes, d/w 36" cyls. 13½x15", built by Lima in 1911

- | | | |
|---|----------|--|
| 3 | w/n 2454 | HT list says withdrawn by 1914, but listed in [17] as if still on books in 1928. Later became <i>EFE 648</i> . |
|---|----------|--|



Whilst none of these images are of high quality, they do at least show the full width buffer beams and side buffers of these two locos – features not common on Shays.

The Shays were used on the steep grade out of Lebu, up to Triangulo 5.5 km away, which was later rack-equipped and operated by the pair of regauged Esslingen U-1 locos from the Palquico a Socavón section of the *Red Norte*.

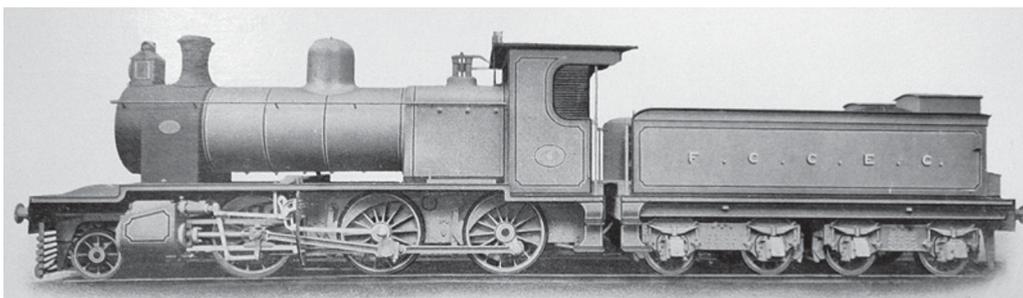
2-6-0 d/w 1372mm 54", cyls. 457x609mm 18"x24", built by Hawthorn Leslie in 1912

Ordered via A. L. Secretan & Co. for Central Eastern Chili, on 1st July 1911. Delivered in January and February 1912. Tenders 2800 gallons, and numbered 1090 and 1091. Elliptical number-plates as for tank locos above.

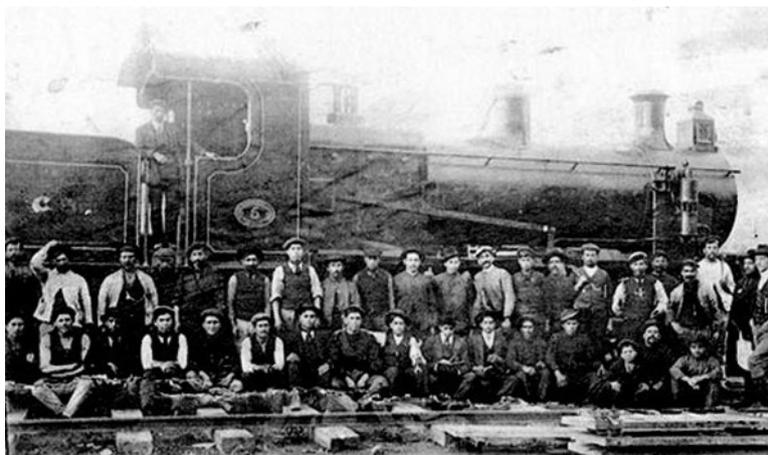
5 w/n 2901 Later became *EFE 586*. Listed in [17] as if still on books in 1928.

6 w/n 2902 Later became *EFE 587*. Listed in [17] as if still on books in 1928.

[42] says (31 May 1916) that “*El tipo de dichas locomotoras es parecido al North British de carga, siendo distintas sus características principales. La dirección opina que no es conveniente adquirir estas locomotoras para no aumentar aun mas la diversidad de locomotoras existentes.*” A report in the 1920 *EFE Boletín* volume again expresses the opinion that the HL locos and one Shay that were for sale were of no interest to the *EFE*. This was despite the price having been reduced. However, both 2-6-0s were indeed sold to the *DOP* at some point and were in use on Selva Oscura to Curacautín construction as Nos. **5** & **6** [accordingly to Copeland]. They later came to the *EFE* fleet as *tipo 57A*.



Builders' photo from a Hawthorn Leslie catalogue.



There should be a seventh loco of some kind, as seven appears in several sources as the total number. Five had independent tenders and two were shown as tank locos. Of the seven, six were shown as the property of the railway, and one as leased. The guess must therefore be that the missing engine was a leased tender loco. *Tipo 24* loco no. **97** was leased by the *EFE* to this railway in 1923. It is certainly possible that this was the engine referred to. The details of no. **97** in the main *EFE* list are repeated below.

Tipo 24

4-4-0 d/w 1676mm 66", cyls. 432x609mm 17"x24", built by Rogers in 1870

97 'CONCEPCIÓN' w/n (1721 in CF list) ex *FCCCiT* no. **1** or **2**? BLW list gives dimensions as d/w 65" & cyls as 16½"x24". *EFE* 1902 list gives d/w 66" and cyls. 16½"x24". Loco with this number leased to *FC de Lebu a Los Sauces* in 1923 [3].

1.4.6 Lota coal mines

El Cía. Carbonífera e Industrial de Lota later the *Cía. Carbonífera Lota-Schwager SA*

Background

The Cousiño coal mining business at Lota has been covered in some detail in the intermediate gauges file (section 2.2.1), for their rail system was largely of 4' 6" gauge. However, as interchange with the *FC de Arauco* and later the *EFE* became more important much of the system gained a third rail to permit broad gauge wagons to come right in to the coal washery.

Originally such wagons were shunted by 4' 6" gauge locos fitted with offset broad gauge couplers. However, it now begins to look as though in later years the opposite was done, with broad gauge locos also having offset side buffers at a low level for the 4' 6" gauge chaldron wagons.

0-6-0T d/w 36", cyls. 13"x18", built by Manning Wardle in 1920

This loco was built for the *FC de Coronel a Buen Retiro*, see section 1.4.2. It appears to have been moved later to Lota, though it is not known when the Buen Retiro line closed. Of course the Buen Retiro mines were owned by the Lota company, as was the *FC de Arauco* over which the transfer would have been made. Thanks are due to Helmut Dahlhaus for pointing out the identity of this engine.

‘YOBILO’

w/n 1983

The photo below suggests that the loco had been reboilered with a dome much further forward. The previously low-profile cab has been enlarged though retaining the closely spaced front spectacles. A replacement front buffer beam has lost the original broad gauge side buffers, and in exchange has gained an offset low level coupling and buffers for the 4' 6" gauge chaldron wagons used at Lota.



This still image has been taken from the same 1965 film about Lota mentioned at the end of section 1.4.1 in connection with the Mitsubishi 2-6-2s built in 1953. The film can be seen at <https://www.youtube.com/watch?v=02Dbyf0dOqg>. This image comes from minute 9.25. The high level coupling is on the centre line of the loco, though strangely it is not a knuckle coupler, and there are the remnants of low level side buffers offset to suit the 4' 6" gauge.

MAPA

De los Ferrocarriles

DE COQUIMBO

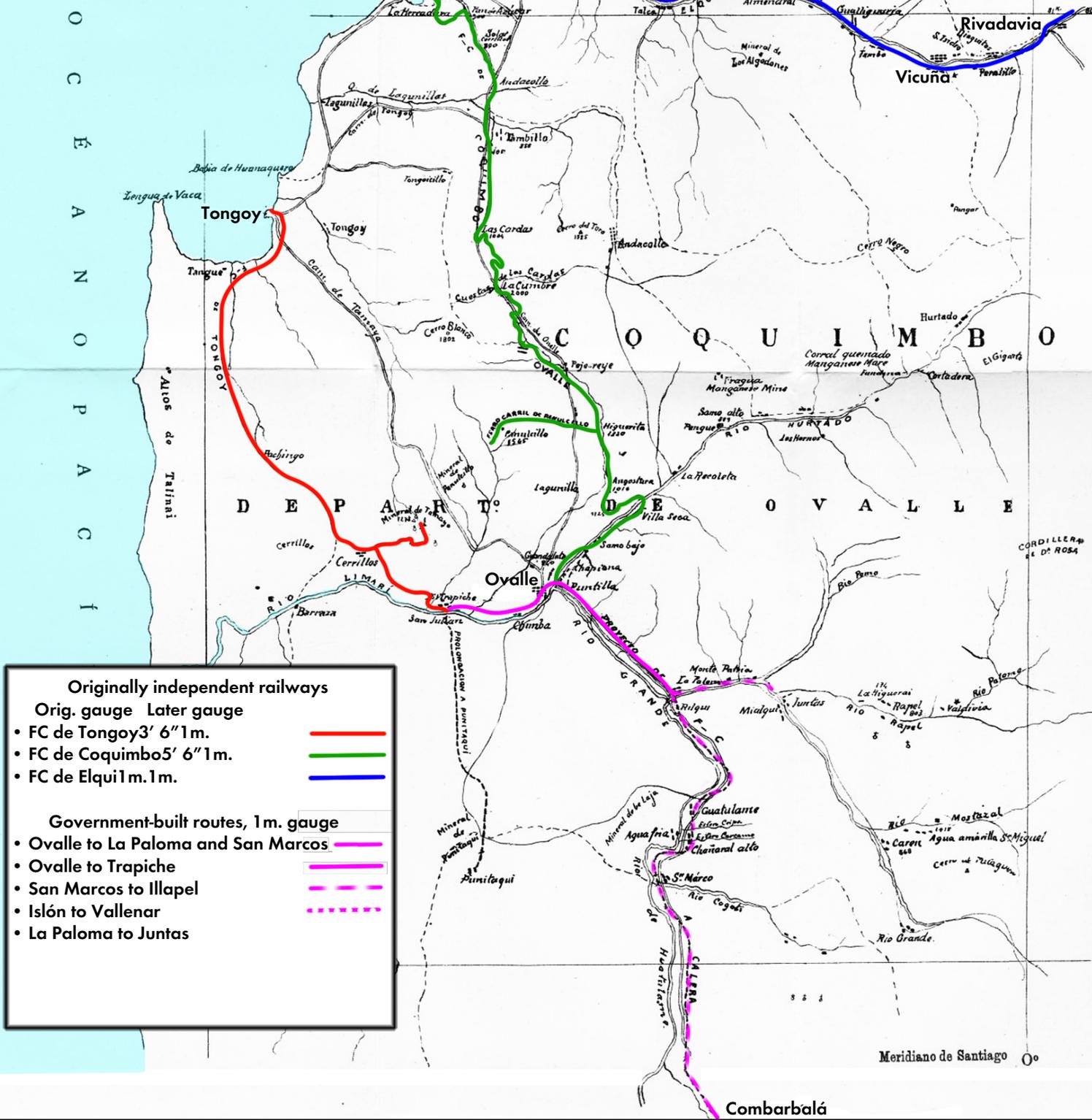
1898

SIGNOS CONVENCIONALES

- | | | |
|-------------------------------|------------------------|-----------------|
| - Puntos | - Ferrocarriles | o Minas de oro |
| o Parroquias | - Caminos carreteros | * Id. de plata |
| * Haciendas | - Id. vecinales | o Id. de cobre |
| - Casas | - Límites de Chile | o Id. de carbon |
| - Hornos de fundicion | - Id. de provincias | |
| - Estaciones de Ferrocarriles | - Id. de departamentos | |

Escala 1 a 520000

The original background map on which the railways are located seems to be inaccurate in a number of respects. Please therefore regard this as a sketch map rather than an accurate one.



Originally independent railways

Orig. gauge Later gauge

- FC de Tongoy 3' 6" 1m. —
- FC de Coquimbo 5' 6" 1m. —
- FC de Elqui 1m. 1m. —

Government-built routes, 1m. gauge

- Ovalle to La Paloma and San Marcos —
- Ovalle to Trapiche - - -
- San Marcos to Illapel · · ·
- Islón to Vallenar · · · · ·
- La Paloma to Juntas · · · · ·

1.5 Other public railways

1.5.1 *El FC de Coquimbo*

Background

1676mm Gauge. Concession granted 1855, opened in 1862. Ran from La Compañía near La Serena, through Coquimbo and southward to Puntilla near Ovalle. There were two branches, one of 1km length to Guayacan, and another of 8 km length from Higuera to Panulcillo. Five locomotives were owned in 1864. The metre gauge *FC de Elqui* arrived in 1885 and the section from La Compañía to La Serena was dual gauge from then on. Source [12] lists locos, with further details from source [15]. 1872 operational details from annual *Memoria del Directorio* of the railway, in *Biblioteca Nacional*, Santiago. 1898 loco mileages in railway's *Memoria del Directorio 1898*, copy in file [MOBR1012] in *Archivo Nacional Histórico*, Santiago. Taken over by state in 1896 [16] and run by *EFE*. Gauge changed to 1m from around 1906? to about 1914 and last broad gauge train ran in 1916 or 1917.

4-4-0s (or possibly 2-4-2s) d/w 54", cyls. 16"x24" built by Slaughter Gruning / Avonside in 1861
23T adhesive weight, weighing 30T & with 4-wheel tender 34.5T total, coupled wheelbase 7' 0", BP 140psi, for pass. trains. Names of all locos come from railway's own reports as mentioned above, or from Pablo Moraga. These locos up and running in 1862 [51].

1 'COQUIMBO'	w/n ?	1872 dismantled awaiting new boiler. In 1898 ran 59 days and 4870 miles. In service 1905 and 1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run.
2 'ANDACOLLO'	w/n ?	1863 report by railway's <i>super-intendente</i> gives the name as 'SERENA' but 'La SERENA' is more likely. 1872 Awaiting new boiler. In 1898 ran 2 days and 140 miles. In service 1905 and 1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run.
3 'LAS CARDAS'	w/n ?	1872 Good condition, awaiting new boiler. In 1898 ran 67 days and 5414 miles. In service 1905 and 1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run. In 1907 a cylinder had fractured and a cast bronze plate was temporarily fitted whilst a new cylinder was awaited.

2-6-0T, d/w 51", cyls. 15"x18", built by Avonside in 1865 (possibly 1864?)

Weighing 26T adhesive, 29 tonnes empty, 31.5T total, 10' 6" coupled wheelbase, BP 140psi, for mixed traffic to La Serena. Avonside list says cyls. were 16"x24". Source [5] confirms a tank loco with pony truck for this railway sent out from UK by 1864. This may have been the tank loco "with a two wheel bogie truck" designed by Edward Woods [63] which was supposedly "highly satisfactory".

4 'LA SERENA'	w/n ?	1872 Good condition and held in reserve. In 1898 ran 91 days and 5482 miles. In service 1905 and 1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run.
5 'LA COMPAÑÍA'	w/n ?	1872 Dismantled. In 1898 ran 93 days and 5724 miles. In service 1905 and 1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run.

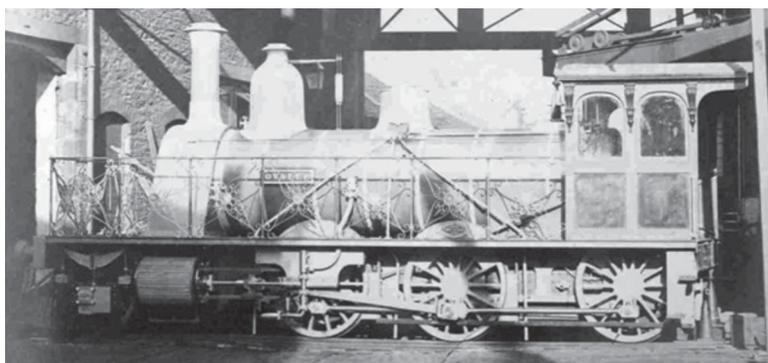
Avonside works numbers

J. B. Rowley's Avonside list suggests that the locos supplied to Coquimbo included nos. 422-426 of 1861, 0-4-2s with d/w 66" and cyls. 16x24", and 519 of 1863, a 2-4-0T.

2-6-0 d/w 54", cyls. 16"x24", built by Avonside in 1865

Adhesive weight 30T, total 38.5T, with 4 wheel tender, wheelbase (coupled?) 13' 5", BP 140psi, for mixed traffic to La Serena. NB These works numbers have alternatively been suggested as being for FCSV 0-4-2s on page 7. This needs investigating. Builder's photo, below, shows circular marine type coupling rods (but not the connecting rods), and intricate wrought iron railings along full length of running board, also crosshead-driven boiler feed pump on left hand side. Works numbers confirmed in letter from Avonside to P. C. Dewhurst in June 1924.

- 6 'PANULCILLO'** w/n 617 1872 regarded as 2nd grade locos, and in use on passenger trains to south. New fireboxes and tubes. In 1898 ran 19 days and 1393 miles. In service 1905 and 1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run.
- 7 'OVALLE'** w/n 618 1872 regarded as 2nd grade locos, and in use on passenger trains to south. New fireboxes and tubes. In 1898 ran 13 days and 963 miles. In service 1905 and 1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run. Cab was reported damaged in 1907. Covered approx. 36,000km in 1915, one of highest mileages in whole of *Red Norte* [16].



2-4-0T d/w 48", cyls. 12"x18", built by Avonside in 1869-70

Weighing 19 tonnes, adhesive 13T, coupled wheelbase 5' 6", BP 140psi, for ballast trains.

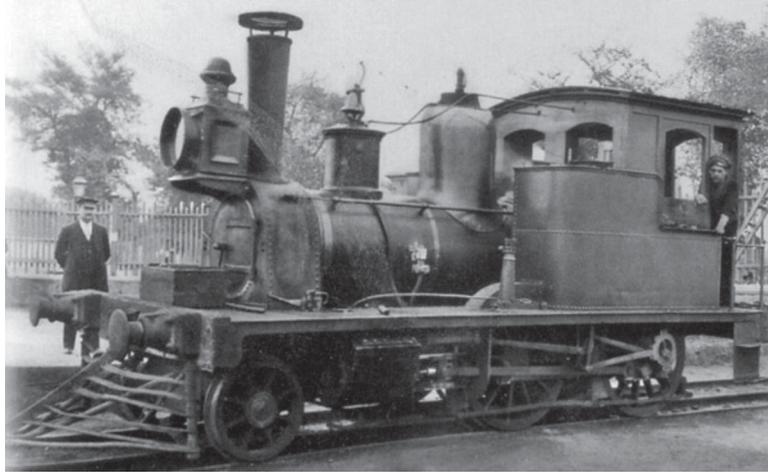
- 8 'VENCEDORA' ex 'La HORMIGA'** w/n 797 1872 regarded as 3rd division loco, and in use on trains to La Serena. Out of service in 1898. In service 1905 and 1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run. In 1907 this loco was numbered **12**, and had been fitted with new brakes[?] (or maybe bearings) on the bogie axle owing to the old ones having overheated. 1907 table in [MOBR1910] is clearly showing this loco as still named '**HORMIGA**'. Covered approx. 36,000km in 1915, one of highest mileages in whole of *Red Norte* [16].

2-4-0T (or possibly 2-2-2T?) d/w 54", cyls. 12"x18", built by Avonside in 1869-70

Weighing 20 tonnes empty, 22 T in working order, adhesive 9.5T (which, if a 2-4-0T, would give an excessive load on the leading truck!), wheelbase (coupled, or maybe rigid?) 5' 6", BP 140psi, for '*servicio de la cuesta*'.

- 9 'PORVENIR' ex 'La ABEJA'** w/n 798 1872 regarded as 3rd division loco, and in use on trains to La Serena. In 1898 ran 15 days and 850 miles. In service 1905 and

1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run. In 1907 was having tubes replaced, and a new smokebox fitted. 1907 table in [MOBR1910] is clearly showing this loco as still named ‘**ABEJA**’, and notably seems to say that it had single ‘*sencilla*’ driving wheels, which would then begin to make sense of the weights listed above.



Precise identity not known; could have been either of the Avonside 2-4-0Ts listed above. If no. **9** was a single driver loco as speculated above, then this one must have been no. **8**.

2-6-2T *d/w1066mm 42", c/w 812mm 32", cyls. 368x508m 14½"x20"*, built by Avonside in 1871 130psi BP. adhesive weight 25T, total 39.5T, 41T in full working order, wheelbase (coupled?) 7' 6", for goods traffic. Initially used back-to-back in pairs, but were separated in 1877. Originally thought to have been 4-6-0T, but 2-6-2Ts are more likely as an *AlldeC* report in 1895 talks of “two bogies of two wheels each”? NB in 1907 table in [MOBR1910] these locos are shown as 2-6-0T and with the first two having the names ‘**VENCEDORA**’ and ‘**PORVENIR**’. A letter dated 3rd November 1927 from Avonside to P. C. Dewhurst, in response to an enquiry from him, states “with regard to the 262 type engine shown by the blueprint which you enclosed and which blueprint is returned, we believe that this locomotive is the locomotive which was built on our order J-793 and shipped to the Copiapo Railway in 1871.”

10 ‘La HORMIGA’	w/n 847	1872 regarded as best locos and used on line to south. In 1898 ran 19 days and 2169 miles. Took name after 1898. In service 1905 and 1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run.
11 ‘La ABEJA’	w/n 848	1872 regarded as best locos and used on line to south. In 1898 ran 55 days and 5699 miles. Took name after 1898. In service 1905 and 1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run.
12 ‘La EMPRESA’	w/n 849	1872 regarded as best locos and used on line to south. In 1898 ran 75 days and 7690 miles. Named after 1898. In service 1905 and 1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run.
13 ‘CONSTANCIA’	w/n 850	1872 regarded as best locos and used on line to south. In 1898 ran 55 days and 4835 miles. Named after 1898. In service 1905 and 1905 [MOBR3079] and 1907 [MOBR1910], see Appendix to Metre gauge locos file for days in steam and distances run.

Comments from 1903

A report by the administrator of the Coquimbo railway [in MOBR1598, undated but probably written in 1902-3] soon after its purchase by the government includes the following:

Entre tanto, existe actualmente, sin pérdida ni exclusion de ninguna locomotora, coches ni carros, todo el material que con 30 años de servicios, en su mayor parte, fué entregado por la antigua Compañía. Tres de las locomotoras fueron construidas on 1861, dos en 1865 y cuatro en 1871.

La comision inspectora que visitó este ferrocarril a principios del año pasado, refiriéndose a las locomotoras, equipo de carga y coches de pasajeros, que tienen un aspecto antiguo imposible de reformar, consideró que las primeras estaban, en jeneral, ln tan buen estado de conservacion, que en vista de él, no se me entregaron las dos locomotoras consolidadas quo se habian encargado a Estado Unidos, a mis instancias, y se enviaron a otras secciones mas necesitadas. Tengo todavia sin uso los únicos seis calderos que he obtenido, en provision de que nada es eterno, para reemplazar a los que hemos estado, a fuerza de parches y remiendos, manteniendo en servicio.

“Meanwhile, there is currently, without loss or exclusion of any locomotive, cars or cars, all the material that with 30 years of service, for the most part, was delivered by the former company. Three of the locomotives were built in 1861, two in 1865 and four in 1871.

The inspection commission that visited this railway at the beginning of last year, referring to locomotives, goods equipment and passenger cars, which have an old aspect that is impossible to reform, considered that the first ones were, in general, in such a good state of preservation, that in view of this, the two consolidation locomotives that had been ordered in the United States at my request, were not delivered to me and they were sent to other more needy sections. I still have unused the only six boilers that I have obtained, assuming that nothing is eternal, to replace those we have been, by force of patches and repairs, keeping in service.”

Running numbers

The running numbers of the above locos **8-13** seem to have varied. 1905 and 1906 lists in [MOBR3079] show **8 ‘La HORMIGA’, 9 ‘La ABEJA’, 10 ‘La EMPRESA’, 11 ‘La CONSTANCIA’, 12 ‘La VENCEDORA’, and 13 ‘PORVENIR’**. I need to go back over sources looked at earlier to check that any comments indeed applied to the correct locos. Moreover, nos. **8-11** are shown as the 2-6-2Ts, whilst the smallest pair of locos are nos. **12-13**. 1907 **13 ‘PORVENIR’** was being fitted with new tubes, motion being overhauled, a new smokebox and new *descansos*.

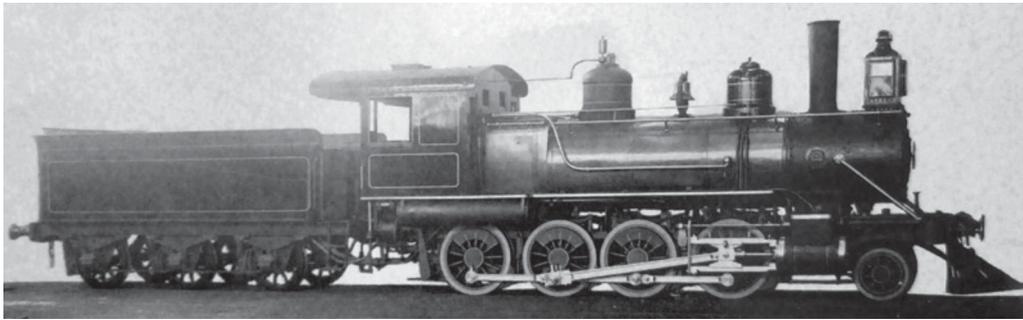
2-8-0 d/w 1220mm 48", cyls. 457x609mm 18" x24", built by Baldwin in 1902

Supplied via Beéche i Cía. Into service June 1902 [9] specifically for the steeply-graded Las Cardas section of this railway. However, seemingly not delivered to Coquimbo immediately (see report quoted above) and certainly not listed in Maestranza Coquimbo fleet in 1905 or 1906 [MOBR 3079] or 1907 [MOBR1910]. A builders’ photo is available at the Penn. RR Museum (no. 01540). The loco purchase price was \$(Chilean Pesos) 46,000 each. BLW class 10-30E nos. 20-21. Spec. is in vol. 24 p129. No running nos. specified. Erecting card drawing 471A-95 is in the DeGolyer Library collection.

291 w/n 19956

292 w/n 19957

Two listed in post-1908 *EFE* diagram book [24], as being in Coquimbo from 1909 (?). 2 locos in class, **291-292**, in 1902 [19], listed as ‘*gradiente excepcional*’. [16] says these were shipped south in 1916 when the Coquimbo broad gauge closed, and then became *tipo* 69 nos. **646-7**. It rather looks as though they had been purchased when all locos were being numbered in a single sequence, but having come to Coquimbo they had then been forgotten about by the main broad gauge network (with their numbers being reused), and thus had to receive new numbers when they went back south in 1916.



BLW archive pic, found in the Dewhurst archive at the NRM; hi-res versions available from Railroad Museum of Pennsylvania.

A 1903 report states that 11 locos were in service and 2 under repair [MOBR1598].

0-6-2T (d/w 1143mm 45", cyls. 381x559mm – dimensions taken from tipo 29 locos, see below), built by Baldwin

Source [16] suggests that there were also a pair of Baldwin 0-6-2Ts here at the end, which then went south to become *EFE* tipo 68 nos. **644-5**. The only suitable 0-6-2Ts built by Baldwin for the Chilean broad gauge were the three *EFE* tipo 29 locos of 1902, that almost immediately went to the *DOP*. Perhaps a couple of them later came here. Their *EFE* numbers were originally **283-5** but later they were *DOP* nos. **117-9**.

? w/n 20211-3?

? w/n 20211-3?

116 ‘LAJA’

Tipo 28 2-6-0 d/w 1422mm 56", cyls. 432x609mm 17"x24", Valparaiso workshops, in 1886. See main *EFE* list for earlier history. This loco was overhauled in Concepción at some time between 1910-15 and then sent north sent to Coquimbo. It returned to Cabritería workshops at Valparaíso in July 1917 and was re-sent to Coquimbo in August 1918 [PMF]. This latter fact seems unlikely if the Coquimbo broad gauge ceased operation in 1916.

1 loco of *tipo* 28 in fleet around 1928 [36], but listed as ‘obsolete or knocked-down’. This suggests that **116** went back to the *Red Sur* at the end of its stint in Coquimbo, rather than being scrapped with the other engines.

[16] also says the Coquimbo broad gauge was operating 10 locos in 1913 (3 for passenger use, 6 for freight, and 1 for shunting). Presumably this data came from a report of that date.

A 1916 numbering scheme?

A 1919 report [46] gives locomotives **31A** and **32A** amongst those covering the highest mileages on the *Red Central Norte* in 1916 and 1917, whilst **23A** and **29A** are also mentioned in the same document. Now, xxA numbers between **1A** and **20A** had been given to locos on the Copiapó railway once they had been merged into the new *RCN* in 1916. It seems likely that any higher xxA numbers would also have been allocated to non-standard and probably odd-gauged locos on other sections, such as the Coquimbo railway. The ‘A’ suffix may well be an abbreviation for ‘*ancha*’ or broad. By 1916 it is unlikely that any original Tongoy railway or Chañaral railway locos were still in use. If the Coquimbo railway still had the ten operational engines recorded in 1913 (see above) then that would take the total of such non-standard machines to 30 – close to the number **32A** just mentioned. However, so far no list of such numbers has been found.

“Al tener que seguir con un presupuesto tan pequeño, con relación a los trabajos por ejecutar y el servicio que aumenta tan rápidamente, nos estamos recargando de maquinas esperando reparacion, como ser: 1a 23 a 1a, 24 1a, 32 1a, 1a 6 13, y 1a 14 y otras como 1a 29a, 23, 31, 15a, 40, 57, 58, 56, que estan en reparacion, ademas tenemos como 27 carros esperando reparacion, a pesar que todos los dias estamos sabiendo, por otra parte, que hay que arreglar

carros para la descarga del coke.” The numbers in this paragraph are puzzling, and even if some of the “1a” = first are actually “la” = the definite article, the meaning remains unclear.

The fate of the engines

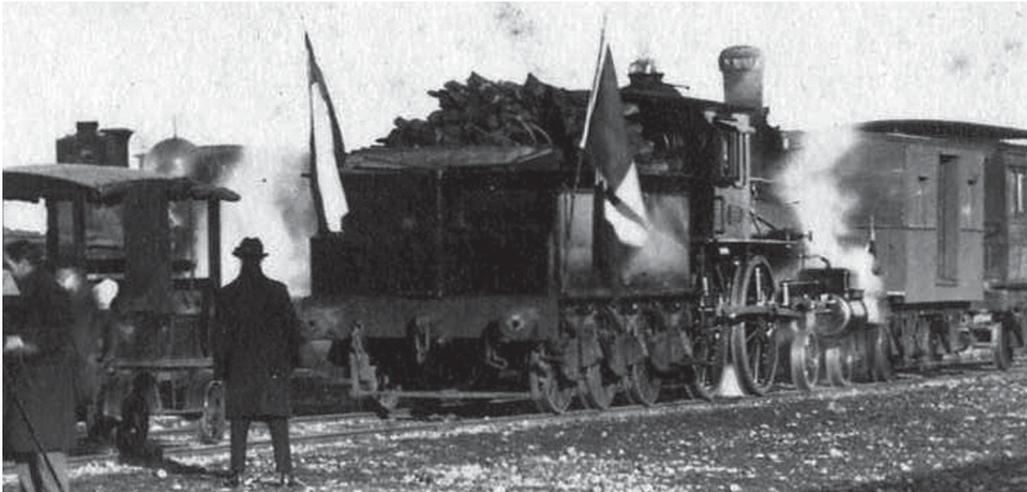
A paragraph in source [12] comments: *“Es inutil que repeta lo ya espuesto, sobre el valor intrinseco de las locomotoras, el cual disminuye de año en año. Solo tengo que agregar una observacion que hace aun manos valioso que material para el Estado, i es que todas ellas tienen su mecanismo de distribucion aplicado de tal modo sobre los ejes, que entre el borde interior del riel i el paramento del anden de las estaciones debe quedar 0.762 metros (30 pulgadas) libres para que puedan pasar sin dificultad. Esta sujeccion, inhabilita al Estado para usar estas locomotoras en sus lineas centrales, que tienen la misma trocha, i solo podrian ser llevadas a Valdivia i a condicion de que no se construyan alli los andenes de las estaciones como en el resto de la red del Estado.”* ie. “It is unnecessary to repeat what has already been said on the intrinsic value of the locomotives, which decreases from year to year. I just need to add a comment that makes it less likely that this is valuable material for the State, and this is that they all have their valve gear implemented in such a way on the axles, that between the inside edge of the rail and the facing of the platform of the stations there should be 0,762 meters (30 inches) free, for them to pass without difficulty. This problem prevents the State from using these locomotives in their central lines, which have the same gauge, thus they could only be sent to Valdivia, on condition that the platforms of the stations there will not be built as in the rest of the State network.” Since there is no evidence that these locos went to Valdivia, and a good deal to suggest that they didn’t, it seems likely that they were scrapped. The valve gear mentioned was probably outside Stephenson's link motion, with eccentrics that would have fouled normal *EFE* platforms.

1.5.2 The branches from Freire

El FC de Freire a Cunco

Background

This broad gauge branch was constructed between 1921 and 1924, using a contractor under the supervision of the *DOP* in the usual way. The contractor was *la Sociedad Constructora Félix Corte y Cía.*, who certainly used locomotives during the work, an ex-mainline 4-4-0 probably hired from the *DOP* and something rather smaller that can be seen in the background of the photo below. On the 25th July 1924 the operation of the completed line was handed over to the *EFE*. The reference below in the notes about the history of *EFE* loco **272** is therefore puzzling.



This photo taken at Allipen shows an inspection train during the opening of the Pedregoso and Trumpulo bridges in 1923. The loco in the centre is a mainline 4-4-0 with a six-wheeled tender, probably of *tipo 43*, whilst in the left background is a much smaller engine of some kind. Courtesy of Sr. Pablo Moraga.

Tipo 15

4-4-0 d/w 1676mm 66" , 381x609mm 15" x24" , built by Baldwin in 1889 for the North & South American Construction Co.

272 w/n 10021 Named '**SAN JOSÉ**' at Valdivia in 1901, but sometimes numbered **260** [4]. Loco with this number **272** leased to '*FC de Freire a Cunco*' in 1931 [3]. Perhaps the Freire to Toltén line (below) was meant.

El FC de Freire a Toltén

This was built by local finance and opened 1938 to link Freire to Toltén port. The contractor was Don Edgardo Palma. The stations from Freire were Martínez de Rosas, Barros Arana, Huilio, Trehuaco / Hualpin, and Toltén. Presumably the railway owned its own locos, but no detail are known. It was incorporated into the *EFE* in 1958 but seriously damaged by the 1960 earthquake [16]. Another source states that trains were running to Hualpin in 1967 and later, and implies that it was the section onward to Toltén that had been irreversibly damaged. In fact Toltén itself had been virtually destroyed by the tsunami, and has now been replaced by Toltén Nuevo.

1.5.3 *El FC de San Pedro al Puerto de Quintero*

Background

(Not to be confused with the earlier metre gauge *FC de Quintero*) Broad gauge, near Valparaiso. Authorised by decree in July 1914. Line may have only begun operating in 1920s. One report says first loco arrived Nov 1924 and service began March 1925. 39km of track and 6 stations. ‘Paralizado’ in 1931. Taken over temporarily by government in 1932, returned to a syndicate (or a liquidator?). Source [47] states that the company operated one loco in 1936. *Sociedad de Ferrocarril, Puerto y Balneario de Quintero* went bust in 1939, and line was taken over provisionally by *EFE*. Finally taken over by government in 1940s. Mostly still open, though short section at Quintero end now closed.

Extract from *EFE* list above:

Tipo 14

4-4-0 d/w 1676mm 66", cyls. 457x609mm 18"x24", built at EFE Valparaiso workshops, in 1887.

A loco **67** was leased to the *FC Quintero* (sic) near Valparaiso in 1930 [3].

67 ‘MONTT’

The 1929 *memoria anual* of the *EFE* states: ‘*Ventas. – Locomotora No. 294 al Ferrocarril y Balneario de Quintero.*’ **294** was a *tipo 20*. However, a 1937 apparently says that this engine had returned to the *EFE*, so maybe it had just been leased rather than sold.

Tipo 20

4-4-0 d/w 1676mm 66", cyls. 445x609mm 17½"x24", built by Balfour Lyon in 1909
294



This well-known postcard reputedly shows a loco on the Quintero to San Pedro railway. This looks very much like a Balfour Lyon-built *tipo 20*, so it is probably no. **294**.

1.6 A variety of small scale industrial users

1.6.1 Contractors

Sres. Germain y Sierra, contractors

This company also had metre gauge locos, for which see the appropriate file.

0-4-2T d/w 36", cyls. 12"x16", built by Vulcan Iron Works in 1912 (1-2) and 1913 (3)

Delivered via Valparaiso.

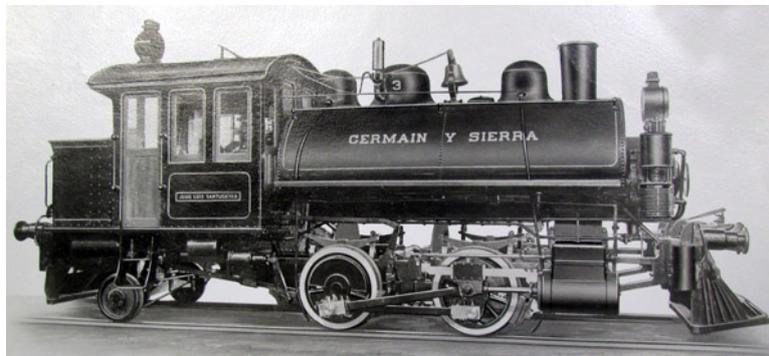
1 'GONZALO URREJOLA' w/n 1885

2 'JUAN CASTELLON' w/n 1886

3 'JUAN LUIS SANFUENTES' w/n 2182

All later sold to *EFE* and became nos. **640-642**.

Nos. **1** and **2** carried combined number and name plates whilst numbers **3** and **4** had simpler plates showing only their names.

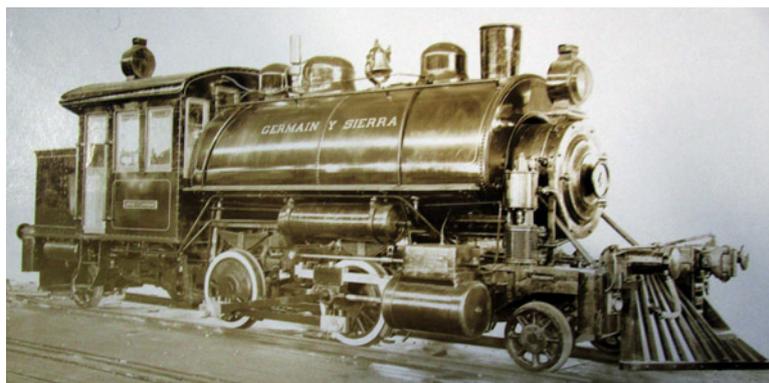


A VIW catalogue illustration, from the P. C. Dewhurst archive.

2-4-2T d/w 37", cyls. 15"x20", built by Vulcan Iron Works in 1913

Delivered via Tomé.

4 'JAVIER EYZAGUIRRE' w/n 2187 Later sold to *EFE* and became no. **639**.



A VIW catalogue illustration, from the P. C. Dewhurst archive.

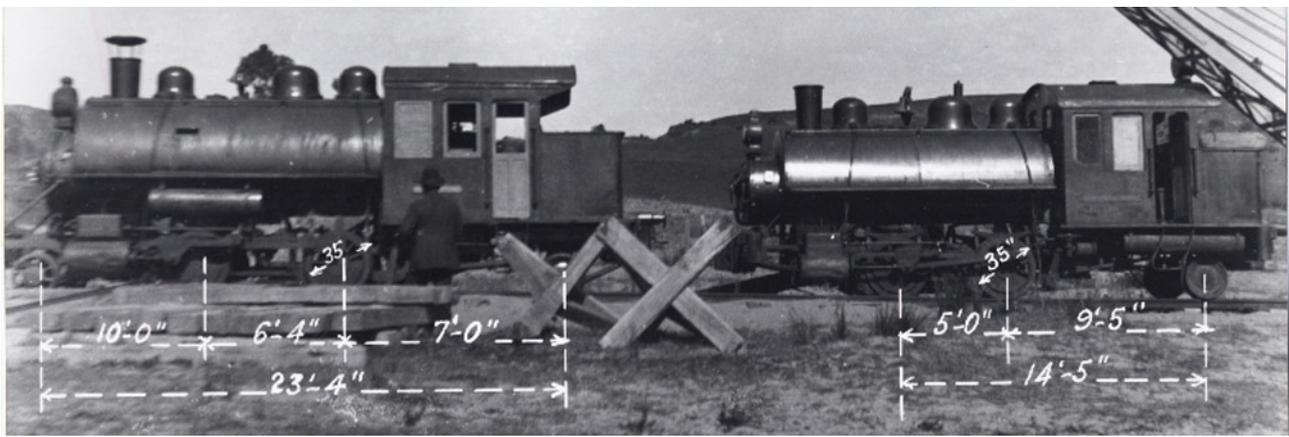


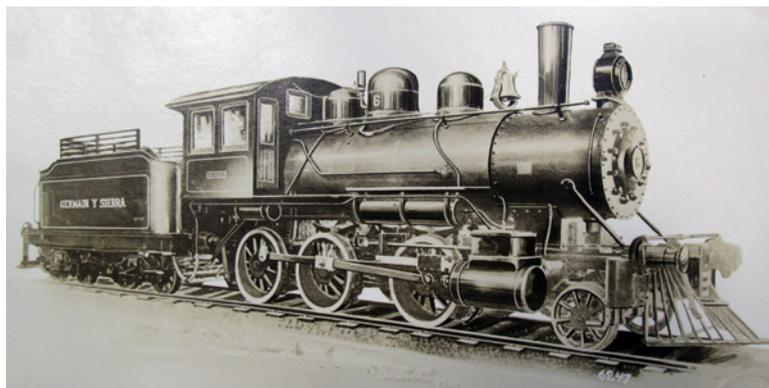
Photo shows 2-4-2T no. 4 (left) and 0-4-2T no. 3 (right). From Pablo Moraga's collection but also found in the collection of the *Archivo Historico Coya*.

2-6-0 d/w 46", cyls. 15"x20", built by Vulcan Iron Works in 1914

All delivered via Tomé.

- | | |
|-----------------------------|----------|
| 6 'LOUIS SERRANO' | w/n 2296 |
| 7 'CARLOS SYMMES' | w/n 2297 |
| 8 'GABRIEL QUIROS' | w/n 2307 |
| 9 'ALEJENDRO GUZMAN' | w/n 2308 |

All later sold to *EFE* and became nos. **634-637**.



A VIW catalogue illustration, from the P. C. Dewhurst archive.

Attempts to sell them on to the *EFE*

[42] says (31 May 1916) that “*la administracion de la III Zona, a quien se le pidio informe al respecto, manifiesta que, segun el examen practicado de ese equipo, no hai conveniencia en adquirir las locomotoras, carros, etc., que ofrecen en venta los indicados senores. En efecto, las locomotoras estan desarmadas, son de tipos diferentes i ninguna es del tipo que usa la Empresa.*” There were no further references in the 1916 volume.

It seems that all of the above locos were, however, sold to the *EFE* around 1918 or 1919, probably after the completion of *G&S*'s contract building the Confluencia to Tomé railway. During that contract *G&S* were reported as having ten locos at work [MOBR2838], A Manning Wardle 0-4-0ST joined the *EFE* fleet at the same time as the *G&S* locos and may well have come from the same source. This was possibly one of two supplied via Woodgate Innes & Co. in 1893-4. One or perhaps two MW 0-4-0STs worked on the Valdivia to Osorno railway contracts which started at that time. MW nos. 1266 and 1281 were supplied to Chile, but unlike all other MW locos for the country, the original purchasers are unknown. If *EFE* 638 was indeed one of these two, the basic dimensions would be d/w 36", cyls. 11"x16". On the other hand [26] suggests this was MW w/n 1770. If one of these had later been a *G&S* loco it might have been their number 5, or number 10.

The North & South American Construction Co.

Background

The sorry saga of this American contractor is set out in an appendix at the end of this file (section 1.8.1). It is known to have purchased the following batch of fourteen Baldwin locos for the construction works and for eventual use on the completed railways. It also had three locos specifically for construction work on the metre gauge. No details are yet known of those machines.

4-4-0 d/w 1676mm 66", 381x609mm 15"x24", built by Baldwin in 1889

Class 8-24C nos. 140-153. These were identical to *EFE tipo 15*. In the *DOP 'Boletín'* for October to December 1889, page 796, there is a reference to “*Especificaciones de locomotoras para pasajeros, tipo <Lircay>*”, presumably meaning these engines. The reference to ‘*Lircay*’ will be because the first *EFE* loco of that type, later known as *tipo 15*, was no. **68 ‘LIRCAI’**, ex *FCS* no. **20**, ex *FCCCiT* no **21**.

Some, at least, of these may have been set to work on N&SACCo contracts before the transfer of the company's assets first to Señor Julio Bernstein. The locos, and much else, were eventually expropriated by the government and handed to the *DOP*. See extended list in *DOP* section 1.3.1, above.

?	w/n 10002
?	w/n 10003
?	w/n 10006
?	w/n 10007
?	w/n 10008
?	w/n 10009
?	w/n 10010
?	w/n 10011
?	w/n 10013
?	w/n 10017
?	w/n 10020
?	w/n 10021
?	w/n 10022
?	w/n 10023

El Sindicato de Obras Públicas

Background

Broad gauge. This was a consortium of private contractors formed to bid for state contracts. As well as its contract to build the metre gauge *FCALP*, the Syndicate seems to have won the contracts to build the line from Curicó to Hualañé (also metre gauge), the first eighteen kilometres of the Rucapehuen to Tomé route (broad gauge), and the Púa to Curacautín branch (broad gauge), and it may have been for one or other of these latter tasks that these locos were purchased. A number of *Sindicato* contracts were terminated prematurely owing to lack of progress.

2-6-0 d/w ? cyls. ?, built by Borsig in 1906

3	w/n 6010
4?	w/n 6289

Both locos were sold to the *DOP*, presumably at the end or termination of *SOP* contracts. See *DOP* section above.



Borsig builder's pic, from Jens Schindler's collection.

2-6-0 cyls. 12x18", d/w 40", built by Lima in 1906, via W. R. Grace & Co.

Shipped from Lima's works on May 31st and June 1st 1906. Whilst no evidence has been found to support the theory, it is certainly possible that the following locos numbered **1** and **2** were originally for the *SOP*. They also later joined the *DOP* fleet, see above. The date of construction matches that of the other *SOP* locos listed here, and this is a more plausible scenario than that locos purchased new by the *DOP* would have been numbered **1** and **2**.

- | | |
|----------|----------|
| 1 | w/n 1032 |
| 2 | w/n 1033 |

***Allard, Dollfus, Sillard et Wiriot,
Le Societé National de Travaux Publics***

Background

Gauge 1676mm, This company were French civil engineering contractors who were active in both Argentina and Chile. In 1910 they were contracted to build the second naval dry dock, "el dique seco de carena", at Talcahuano. They certainly had an arrangement to run their own stone trains on *EFE* tracks [*Actas del Consejo del EFE*, 1914]. The contract was delayed by the First World War and was only completed in 1924.

2-6-0 d/w 56", cyls. 17x24", built by Baldwin in 1912 for this company

There is nothing in the BLW spec sheets to confirm that the destination was Chile, but [39] says this was identical to *EFE tipo 55* locos, and was for the Talcahuano contract. The BLW spec is in vol 44 pp196-7.

- | | |
|--------------|-----------|
| 'LUZ' | w/n 37894 |
|--------------|-----------|

This engine may have eventually joined the *EFE* fleet as no. **492**. An extra *tipo 55* 2-6-0 with that number was added to the fleet sometime in the 1920s; it might have been built from spares but could alternatively have been this loco sold on after the end of the Talcahuano contract.

Don Pedro Rosselot, contractor

Background

Señor Pedro Rosselot, and later his widow Doña Beatrice Aravena, was the contractor for the Osorno to Puerto Montt section of the southern mainline completed in 1913. These locos seem to have been purchased for that contract, but on its completion were sold to the *EFE*. Initial shipment was to Corral in each case, and probably over *EFE* rails from Valdivia to Osorno.

4-4-0 d/w 1422mm 56", cyls. 355x508mm 14" x20", built by Lima in 1908

Names found in Lima works list.

1 'QUEPE'	w/n 1075	Into <i>EFE</i> service 1914 as <i>tipo</i> 62 no. 610 . 'QUEPE' was renowned in Puerto Montt as the first loco to have arrived in the town, though the <i>tipo</i> 55 2-6-0 now plinthed on the water-front and labelled by that name is of a completely different design.
2 'REMOLINOS'	w/n 1076	Into <i>EFE</i> service 1914 as <i>tipo</i> 62 no. 611 [9].
3 'CHAHUILCO'	w/n 1077	Into <i>EFE</i> service 1914 as <i>tipo</i> 62 no. 612 [9].
4 'LLANQUIHUE'	w/n 1078	Into <i>EFE</i> service 1914 as <i>tipo</i> 62 no. 613 [9].



Lima builder's photo of no. 3 **'CHAHUILCO'** in the Dewhurst collection at the NRM in York.

4-4-0 d/w 1524mm 60", cyls. 381x609mm 15"x24", built by Lima in 1910

Names found in Lima works list.

5 'PRESIDENTE PEDRO MONTT'	w/n 1099	Into <i>EFE</i> service 1914 as <i>tipo</i> 63 no. 614 .
6 'MINISTRO HEVÍA RIQUELEME'	w/n 1100	Into <i>EFE</i> service 1914 as <i>tipo</i> 63 no. 615 [9].
7 'VICENTE PÉREZ ROSALES'	w/n 1101	Into <i>EFE</i> service 1914 as <i>tipo</i> 63 no. 616 [9].
8 'MANUEL ANTONIO MATTA'	w/n 1102	Into <i>EFE</i> service 1918 as <i>tipo</i> 63 no. 643 [9].

1.6.2 Ports and shipyards

El Dirección de Obras Maritimas

Responsible for a number of locations.

Tipo 34

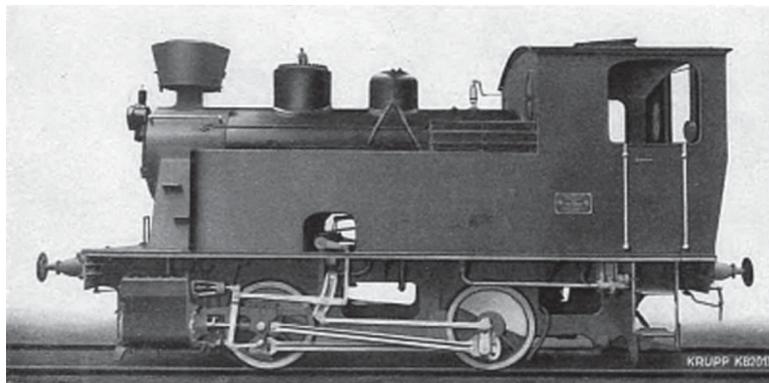
2-6-2ST d/w 1270mm 50", cyls. 406x609mm 16"x24", built by Lima in 1908

165 w/n 1066 EFE loco with this number 'excluidas' in 1930 [3]. Sold to *Dirección de Obras Maritimas* 1932. Location thereafter unknown.

0-4-0T d/w 900mm, cyls. 320x450mm, built by Krupp in 1936, delivered direct to Puerto Montt

Used at Puerto Montt broad gauge port sidings. Later taken over by 'EmPorChi', the *Empresa Portuario de Chile*.

? w/n 1562.



Krupp builder's photo, from Pablo Moraga collection.

El Puerto de San Antonio

Broad gauge, also possessed metre gauge and 60 cm. gauge trackage. *Tipo 37* locos loaned by *EFE* during 1923 and maybe later.

Tipo 37

0-6-0 d/w 1143mm 45", cyls. 381x609mm 15"x24", built by Baldwin in 1889

195 'LO ESPEJO' w/n 10125 Loco with this number loaned to '*Obras Puerto de San Antonio*' in 1923 [3].

196 'AGUILA' w/n 10126 Loco with this number loaned to '*Obras Puerto de San Antonio*' in 1923 [3].

Valparaiso port works – S. Pearson & Sons

S. Pearson and Sons were a British firm of civil engineering contractors who built many large projects around the world. Surprisingly the name survives in the shape of Pearson Publishing Ltd. The locos below were all ordered when they were the principal civil engineering contractors for the Valparaiso port improvements between 1912 and 1930.

0-6-0ST d/w 37", cyls. 12"x18", built by Manning Wardle in 1912

136 'SALINAS'

w/n 1805

137 'VIÑA del MAR'

w/n 1806

this was

F. W.

for

Fred Harman's book gives **237** as the running number but probably a mis-print either there or in the original MW list? Mabbott's book gives **137** as the number, and also shows d/w both locos as 36".

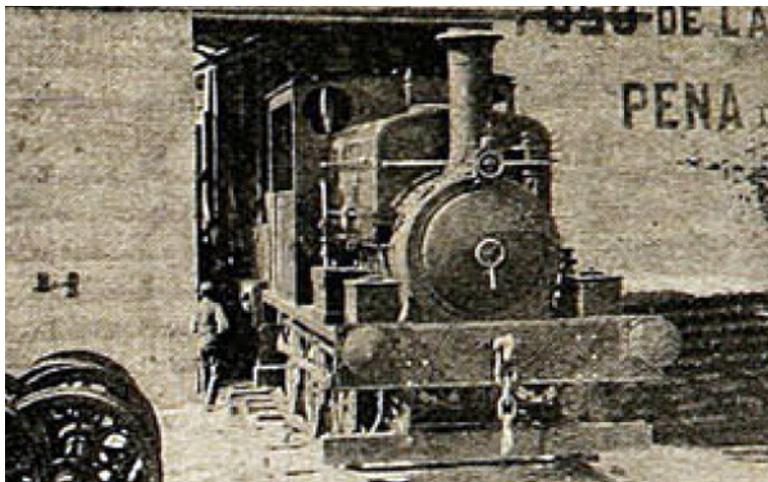
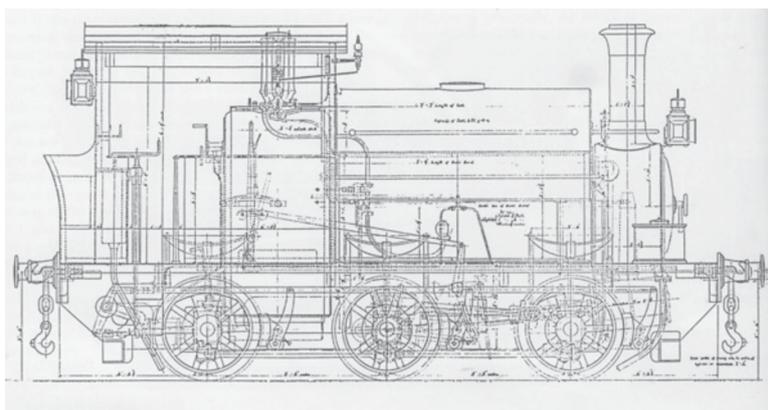


Photo from *Sucesos* issue 545 in 1913, captioned as loco working on Valparaiso port works.



An MW GA drawing of these locos, as reproduced in Fred Harman's book volume 1.



This 1915 photo, from *Sucesos* issue 680, seems to show one of these locos with minor modifications including the addition of dumb buffers and a large headlight. The visitors were engineering students from the University of Chile.

0-6-0ST d/w 40½", inside cyls. 14"x20", built by Hudswell Clarke in 1912 (138-9), 1913 (140), 1914 (141 and 144)

138 'VALPARAISO' w/n 1009

139 'SANTIAGO' w/n 1010

140 'MIRAMAR' w/n 1027 HC works list spells it as **'MIRA-MA'**, but photo confirms plates had conventional spelling.

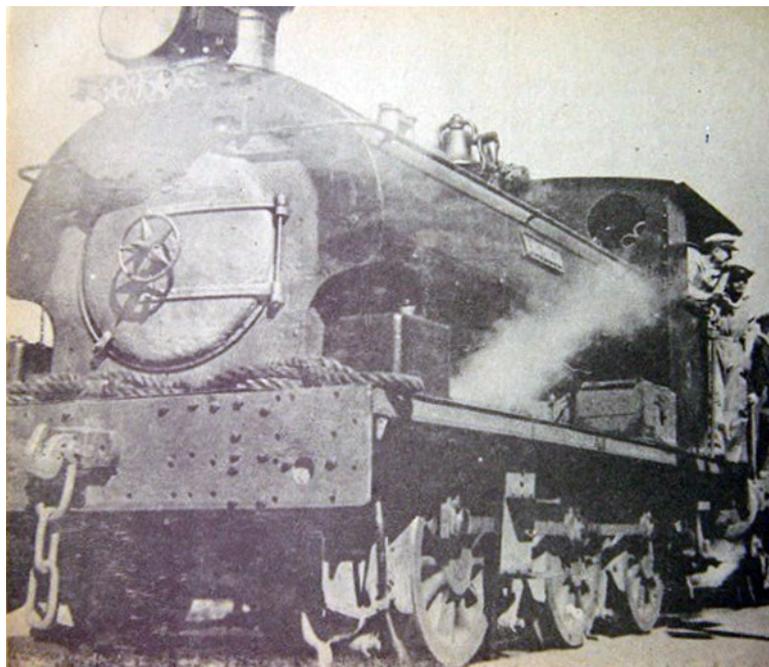
141 'BARÓN' w/n 1053

144 'BELLAVISTA' w/n 1076

At least one of these locos seems to have been sold on after the contracts had been completed, for **140 'MIRAMAR'** was in use by the contractors *Barriga, Wachholtz y Alessandri* on the construction of the *EFE's* Lago Ranco branch in the early 1930s. Another, possibly **'BELLAVISTA'**, was photographed bearing the number **'3'** on its cabside and with modified cab and side buffers removed, probably at a colliery in the Coronel, Lota or Lebu areas.



HC builder's pic, via Hunslet archive at Statfold Barn Farm.



3, possibly **'BELLAVISTA'** in a later life possibly at Lota or Coronel.

0-4-0ST d/w ?, cyls. 9x14", built by Peckett in 1926

? '?' w/n 1710 Running number will have been higher than **159** which had been built in 1923-4. Possibly sold to Chilectra on completion of the port works around 1930, see below in section 1.6.5.

The above running numbers were in Pearson's own international number series, which formally began in 1892, though a few locos were older than that. Nos. **158** and **159** went to northern Ireland in 1924.

Valparaiso port operations, later run by *EmPorChi*

Broad gauge.

0-6-0T d/w ?, cyls. ?, built by Henschel in 1929 for 'Hafen Valparaiso'

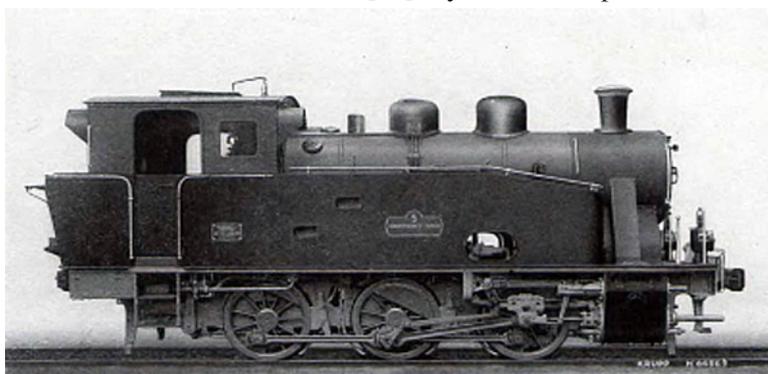
? w/n 21426

? w/n 21427

0-6-0T d/w 1100mm, cyls. 410x550mm, built by Krupp in 1938

5 w/n 1792 Later went to *ENAP Refinaría de Concon* [Merte's list] and now plinthed nearby.

6 w/n 1793 [22] says this is the preserved loco at Concon (see below).



Krupp builder's photo, from Pablo Moraga collection.

Talcahuano port operations, later run by *EmPorChi*

Broad gauge.

? d/w ?, cyls. ?, built by the *Sociedad Maestranza y Galvanizaciones* at an unknown date

PMF states that a book published by *SMG* around 1930, and now in the *Biblioteca Nacional*, lists a loco built for Talcahuano but gives no details.

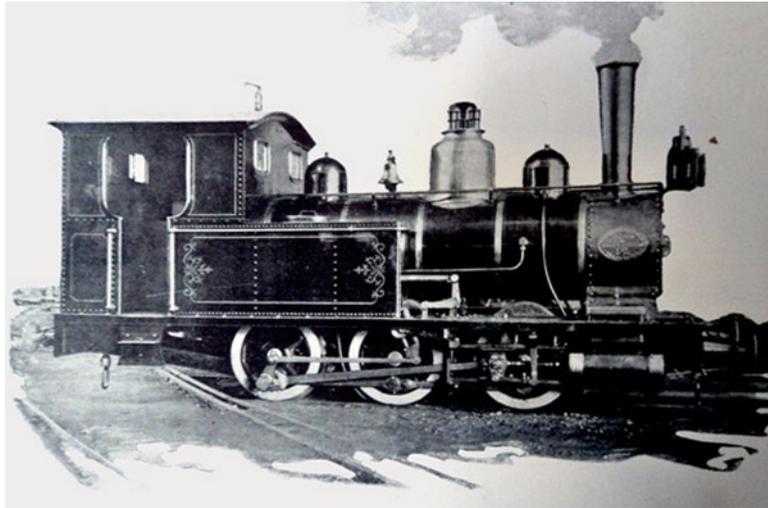
El Apostadero Naval de Talcahuano y los Arsenales de Marina Talcahuano naval base, reorganised on a commercial footing as *AsMar* in 1960

Background

There was a broad gauge 20 km branch from Concepción, which extended 2.5 km north of Talcahuano station to the naval base. [22] suggests the shipyard ran its own passenger service for many years, originally on the parallel metre gauge line which had originally been built to assist in the construction of the first dry dock at the base. Later this moved to the broad gauge. It is possible that the loco mentioned below was acquired to run the passenger service, or more probably for freight operations to and from the base.

0-6-0T d/w? cyls. ?, built by *Lever Murphy* in ?

The book *Lever Murphy y Cía Historia de una empresa Viñamarina 1883-1936*, published in 2016, apparently suggests that LM built four locos for this customer.



Lever Murphy builder's pic, from Pablo Moraga's collection.



The works-plate mounted on the smokebox of the loco seen above, seemingly with the 'LEVER MURPHY' name across the middle, and probably with 'CALETA ABARCA' round the upper curve and 'VALPARAISO' around the lower.

Tipo 41

4-4-0 d/w 1676mm 66", cyls. 483/724x609mm 19"/28"x24" (originally a cross compound), built by Rogers in 1895

237

w/n 5041

Leased to *Apostadero Naval de Talcahuano* 1932 [3].

See also section 3.3.6 in the metre gauge locos file for details of the metre gauge locos at this location.

Construction of muelle Vergara in Viña del Mar

0-4-0ST OC d/w 30", cyls. 8x15", built by Hudswell Clarke 1893. via C. C. Dunkerley & Co. of Manchester for 'L. M & Co.', Valparaiso

Señor Andres Thompson C. reports that the following loco was purchased via Lever Murphy & Co. for the construction of a branch from the *EFE* across Vergara to a new jetty. It may later have been taken over by the operating company, the *Cía de Muelles y Bodegas de la Población de Vergara* (see below), which was a subsidiary of *La Población Vergara Sociedad Anónima*. He states that the loco was mentioned in an article in *El Heraldo* from Valparaíso, November 2nd, 1893.

'AJAX'.

w/n 409

La Cía. de Muelles y Bodegas de la Población de Vergara

Broad gauge.

0-4-0WT d/w 830mm, cyls. 280x400mm, built by Krauss in 1906 for Cía. Azucarera Internacional

Built 1907 [22]. Later purchased by the *Cía de Refinaría de Azúcar de Viña del Mar (CRAV)*, see above.

? became **CRAV 13**

w/n 5613

Displayed on Ave. San Martín in Viña del Mar in 1987 [22],
now at Quinta Vergara in Viña del Mar.



1.6.3 Sugar refineries

Sugar refinery Bernstein, later known as La Cía de Refinería de Azucar de Viña del Mar (CRAV)

Broad gauge. The name Bernstein is that of Señor Julio Bernstein who later purchased the assets and liabilities of the infamous North & South American Construction Co., which see below. CRAV later took over the sugar refineries in Vergara and Penco, which also see below.

0-6-0T d/w 42" cyls. 16x22" 406x559mm built by Lever Murphy in 1894

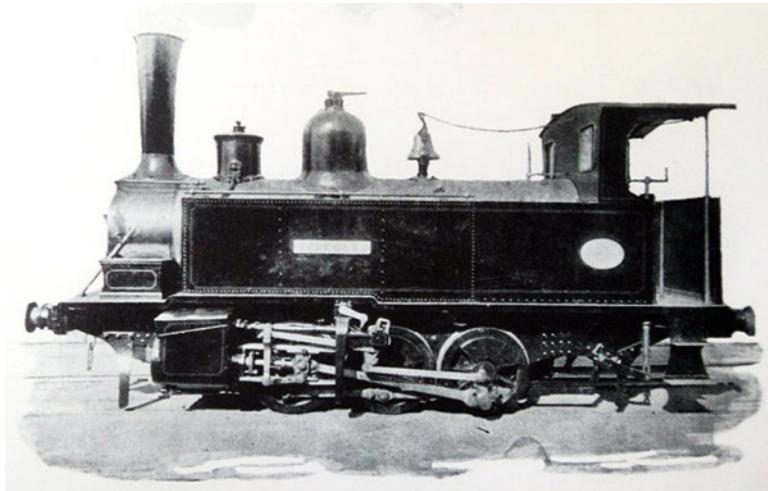
A photo in the magazine *Sucesos* in 1915 showed this loco in use at the refinery. Sr. Andrés Thompson states that there were two of these locomotives. He also believes that they were first built for use on the track of the *Cía. de Muelles y Bodegas de la Poblacion Vergara*.

‘HÉRCULES’

w/n ?

‘?’

w/n ?



Lever Murphy builder's pic, from Pablo Moraga's collection.

0-6-0T d/w ?, cyls. ?, built by Hagans in 1884, for ‘Zuckerfabrik Bernstein’

Dispatched from works 11th February 1885.

?

w/n 177

4-6-0T d/w?, cyls. ?, built by Sociedad Maestranza y Galvanizaciones at an unknown date

Whilst the photo is not very clear, the loco seems to have a crosshead driven boiler feed pump and possibly Joy valve gear. The image shows an engine almost exactly identical to the Fowler 4-6-0Ts on the Nitrate Railways; if it is indeed by *SMiG* then it would seem to have been adapted from the Fowler drawings. It is not certain that this was on the broad gauge, and in fact the lack of side buffers would seem to make that unlikely.

13?

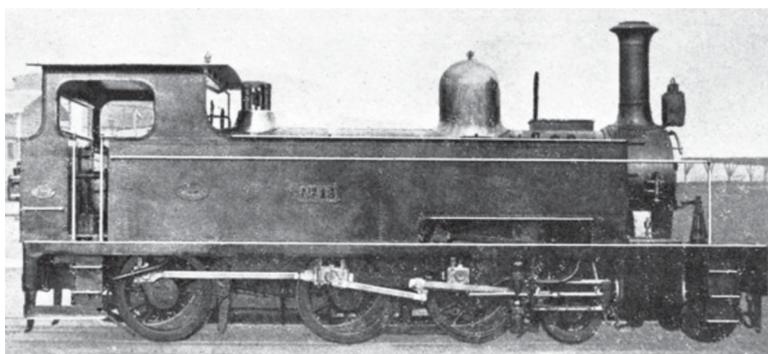


Photo published in an SMiG album in 1921.

This location must have had a number of other locos, as they later purchased the Krauss loco listed immediately below. Source [47] from 1936 states that there were five locomotives in service.

0-4-0WT d/w 830mm, cyls. 280x400mm, built by Krauss in 1906 for Cía. Azucarera Internacional

Built 1907 [22].

CRAV 13 ‘SANTAGUINA’

w/n 5613

Displayed on Ave. San Martín in Viña del Mar in 1987 [22],
now at Quinta Vergara in Viña del Mar?



La Azucaría Penco

Broad gauge. Later taken over by CRAV, which see above.

0-4-0T d/w ? cyls. ?, built by Henschel in 1913

?

w/n 12305

Source [44] tells of the two small locomotives ‘OLGA’ and ‘LAURITA’ which shunted between the Penco sugar refinery and the main railway yard. The photo below shows ‘OLGA’ but whether this is the loco listed above is not certain.



1.6.4 Military establishments

FAMAE – Fábricas y Maestranzas del Ejército de Chile Chilean army factories and workshops

Broad gauge sidings connected to the *FC de Circunvalación* in Santiago.

0-4-0WT d/w ?, cyls. ?, built by Jung in 1929

250hp, 24.2T.

?	w/n 4666	Preserved at <i>FAMAE</i> ?
?	w/n 4667	In Quinta Normal railway museum.



La Fabrica de Cartuchos del Ministerio de Guerra

Background

Broad gauge. The location of this government munitions plant is not known, though it is possible that it later became part of *FAMAE*, see above. However in June 1917 it was the subject of a comprehensive article in *Sucesos* issue 769, which included the photo shown below. A big article published in *Pacifico* magazine in 1914 suggests that this was in the Avenida Penitenciaria in Santiago. There was a branch off the southern stretch of the *FC de Circunvalacion* which ran north alongside the Parque Cousiño (nowadays the Parque O'Higgins).



This is clearly a German-built broad gauge 0-4-0WT, perhaps by O&K though other builders are possible.

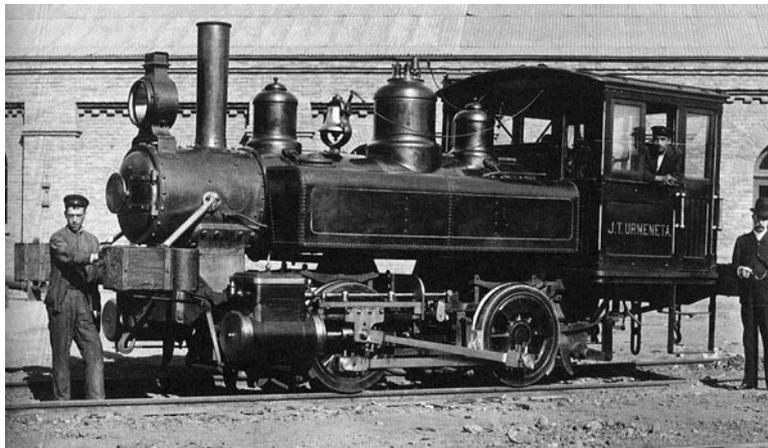
1.6.5 Other industrial owners

La Cía. de Gas de Santiago

0-4-0T d/w 36", cyls. 10"x18", built by Baldwin in 1901

BLW class 4-14C no. 131. Spec in vol 24 p139.

‘JOSÉ TOMÁS URMENETA’ w/n 19678



0-4-0ST d/w 36", cyls. 12"x18", built by Manning Wardle in 1904 and 1911

Delivered via Rose Innes Cox & Co. and Rose Innes Kay & Co., respectively (successive iterations of the same trading house).

‘BLAS VIAL’

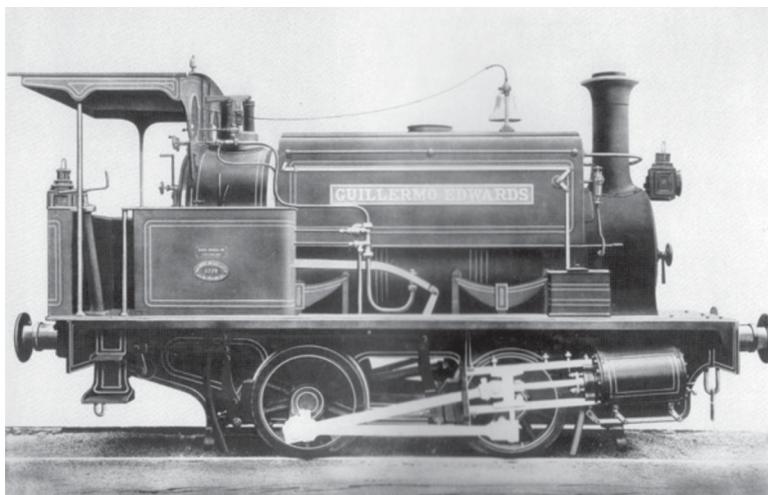
w/n 1639

Plinthed at Santiago gas works.

‘GUILLERMO EDWARDS’

w/n 1770

Plinthed at Santiago gas works.



MW builder's pic, via Fred Harman's MW books.



This photo presumably implies that '**GUILLERMO EDWARDS**' still exists as well as '**BLAS VIAL**'.

However, access to see these survivors requires prior arrangement and the author has not therefore been able to ascertain their current condition. Note that a knuckle coupler has replaced the original European style buffers and chain coupling. The cab has also gained a backsheet. The bars dropping from the buffer beam suggest that a shunters'/switchers' footstep had been provided but has since rotted away.

Baldwin drawings

The collection of Baldwin drawings at the deGolyer Library, Southern Methodist University, includes side elevation (SE) or cross section (CS) drawings for one design built for the Santiago Gas Co.

Index#	DWG#	Tracing#	Road name	Road#	Date	Baldwin class	Number	Wheel	Dwg typ	Size
466-28	4063	-	Santiago Gas	'Urmeneta'	1901	04-14 C	131	0-4-0	SE/CS	3

The list of drawings in which these details were found is at <https://www.smu.edu/~media/Site/Libraries/degolyer/pdfs/BLW-EDWG-RoadName.pdf> whilst arrangements to purchase copies can be found at <https://www.smu.edu/libraries/degolyer/Research/Permissions>

Chilectra

Background

This was an electric power generator, with the name originating from CHilean eLEctric TRAmway & light company, but later interpreted as Compañía CHILena de eLECTRicidad.

A low resolution photograph from the construction of the power station Central Renca in 1945 shows a small saddle tank loco, probably by Peckett. As Peckett only built one broad gauge loco for Chile, for S. Pearson & Co. during their works in the Port of Valparaiso up until 1930, it seems likely this this is that loco after resale to Chilectra.

0-4-0ST d/w ?, cyls. 9x14", built by Peckett in 1926 for S. Pearson & Co.

Probably sold to Chilectra on completion of Pearsons' Valparaiso port works around 1930.

? w/n 1710



Photo from the Chiletra archives found by Pablo Moraga.



A second photo from the same album (<http://www.bibliotecanacionaldigital.gob.cl/visor/BND:554212>) would appear to show the same loco, this time at the Sauce hydro-electric plant at Laguna Verde in Valparaiso.

La Compañía Cervecerías Unidas Limache

Broad gauge. Photo shows a German-built tank loco at one of this company's breweries. This might well be Henschel 20608 of 1925, as illustrated in section 1.7 a couple of pages further on, though this one has piston valves rather than slide valves.

1.8 Appendices

1.8.1 Appendix 1: The North & South American Construction Co.

This US company was contracted to build a number of broad and metre gauge lines by the government in 1889, but rapidly got into difficulties. The whole sorry saga has taken some investigating to get to the bottom of what really happened.

A summary of events

The company was formed in the state of Kentucky by Henry C. Comegys and Jared N. Lewis, together with directors of the Union Bridge Co. of Buffalo NY including Newton B. Lord and General George S. Field, with work in Chile specifically in mind. As an aside neither Comegys nor Lord seem to have had unblemished records. Business commenced on 1st June 1888, and contracts were won almost immediately from the Chilean state to build around 680 miles of metre and broad gauge railways, implying that negotiations had been in hand prior to the company's formal incorporation. Payment was to be in a lump sum of \$15,000,000 on completion, but in the meantime the company gave the Chilean government a bond in gold of \$1,000,000.

“The contract calls for the construction of railway, with all necessary bridges, stations, machine shops, tanks, round-houses, 800 cars and about fifty locomotives. The road must be in working order in two years, but they have about five years in which to complete the whole work.” [The Great Falls Tribune Jan 5th 1889]. The last sentence was not in fact correct; the contract actually specified that the Santiago to Melipilla, Pelequen to Peumo, Palmilla to Alcones, and Huasco to Vallenar lines should be completed within two years; the Calera to La Ligua and Cabildo, Los Vilos to Illapel and Salamanca, Constitucion to Talca, and Coihue to Mulchen routes within three years; and the three parts of the Victoria to Valdivia and Osorno mainline within five years.

Whilst materials including the locomotives listed below were ordered and despatched to Chile, and engineers and workers were taken on, it became apparent in mid 1889 that the Chilean end of the operation, that had been run by Lewis and Lord, was in a bad way. Lewis and Lord had fallen out, a considerable amount of money was owed to creditors and the government seems to have ‘soured’ on the whole scheme. General Field, visiting Chile in June 1889, felt that he had no option but to arrange the sale of the assets and liabilities of the company in Chile, eventually to Señor Julio Bernstein. Amongst other things Señor Bernstein had been the entrepreneur of the sugar refinery in Viña del Mar.

At this point various law-suits began, by Messrs. Comegys, Lewis and Wyman against “Field and associates’ alleging fraud, and by the company against the Chilean government of José Manuel Balmaceda. The first of these was thrown out by a New York court, and the other seems to have come up against the refusal of the Chilean government to accept international arbitration (an attitude that they were entitled to take, the contract having specified that the contracting organisation would be treated as if it were based in Chile rather than overseas). On October 7th 1889, at a meeting in Louisville, Kentucky, the directors were authorised to continue or to wind up the company as seemed appropriate [MOBR287].

In the meantime Balmaceda's government, which was acting increasingly autocratically, had ordered Señor Bernstein to bring the workforce up to almost 15,000 labourers, in order to make up for lost time. Bernstein had refused, and the government thereupon expropriated all the assets of the project, on the grounds that completing the tasks within the prescribed time-scale was now impossible. These assets included the following items which had been acquired:

- 46,000 tonnes of rails.
- 5,000m of metal bridges.
- 275 wagons for the operational railways.
- 14 locomotives.
- drilling machines for tunnels.
- locomotives and wagons for use during construction works.

2,000,000 feet of Oregon pine.

400,000 sleepers.

20,000 barrels of cement.

20,000 quintals of galvanised iron.

Señor Bernstein then died in January 1891, adding to the legal complications within Chile. These included difficulties caused by the incorrect original registration of the company in Kentucky and by the transfer of rights to Bernstein without approval from the government as had been required, and arguments as to whether or not Bernstein's descendants inherited those rights

Of course, only a few months after all this, civil war broke out in Chile between Balmaceda's supporters and the Chilean Congress, with the result that Balmaceda was defeated, he himself committing suicide in the Argentine legation during September 1891.

[Sources: *New York Herald* Feb 17 1891, *Salem Daily News* Feb 2 1889, and other US newspapers. *DOP* and *EFE 'boletines'* and *'memorias'* of the time, mostly found in the Hathi Trust archive online. Also *Documentos jenerales sobre la "North and South American Construction Company"*, para el uso del Tribunal Arbitral de Ferrocarriles, Santiago de Chile: Impr. Barcelona, 1897; and *Exposición presentada al gobierno / por la Compañía Constructora de Ferrocarriles*, by Juan A. Palazuelos, *Compañía Constructora de Ferrocarriles*, published 1892. There is much extra material in MOBR287 and MOBR354 but not all of it has yet been examined.]

A press report

From an article *The Railroads of Chili*, by F. W. Conn of *The Railroad Gazette*, reprinted in the *The Railway Engineer*, February 1891, pages 37-40.

"A contract for the extension of the government lines was awarded in the latter part of 1888 to the North and South American Construction Company. These extensions amounted in the aggregate to nearly 1,000 kilometres, comprising 11 different lines and branches, each taken for a lump sum, the whole amounting in round numbers to \$20,000,000 gold.

By the terms of the contract, the lines were to be constructed, equipped and operated for one year before being received by the government. The company's representative signed the contract without inspecting any of the proposed lines. The contract was based on the government engineer's estimates and locations, and the prices on all but one of the lines were too low. I was all over the lines in the interest of sub-contractors, and know whereof I speak. Such firms as McAuthor Brothers, James Ross & Co., Col. Gainer, and Ross & MacKenzie, went to Chili to take some of this work, but none of them would touch it. There was a good margin on the equipment, and perhaps the Construction Company, with good management, might have pulled through. The company had no plant whatever, and tools were purchased in wholesale stores at retail prices and work was begun. About this time one of the directors arrived from New York armed with the necessary authority to oust the vice-president and take charge himself. This made trouble at once, as the former representative had many friends in power. High words between the managing director and the ex-vice-president at the Union Club, in the presence of some of the best men in the country, a challenge, and then no fight, did not tend to improve matters. An unfortunate remark by the chief engineer of the company to the effect that the government engineers were no good, did not help matters. Monthly estimates were refused on the ground that the work was not being done according to the specifications. This was true enough; the specifications said that the slopes of the embankments must be sodded, and that the ditches should be one metre wide and one metre deep, with a slope of 45°. If any more earth was needed for embankment, it must be hauled from the nearest cut. The limit of free haul was 500 metres (1,649 feet). At the prices given it was utterly impossible for the company to fulfil its contract and the government plainly showed its intention of holding them to it. A government engineer in charge of one of the lines went to the Minister of Public Works with a story that the Construction Company had attempted to bribe him. And so matters went on from bad to worse, with constant quarrels between the local representatives of the company, and finally the concessions and contract were given up. Work is now going on under government supervision.

...

The most important of these lines is the one from Victoria to Osorno, with a branch to Valdivia, the whole line being 403 kilometres in length. This is the extension of the trunk line and will complete the southern end. It will run through a fine timber country and the best land in Chili, as yet untouched. The estimate for this line was made from a preliminary survey which could be very much improved upon. Politics have something to do with the location of railroads in Chili – so the opposition say. If the North and South American Construction Company had had a clause in their contract allowing them to re-locate with their own engineer, they could have made a big thing.”

The company’s locomotives

The afore-mentioned list of assets includes the fourteen broad gauge 4-4-0 locos which been ordered from Baldwin in March 1889 (as clearly detailed in earlier sections of this file). There is no mention of metre gauge locos for the operating railways, but the construction locos and stock mentioned in item six of the list seems to have included three metre gauge engines [*DOP memoria* 1891, p19]. A list of suppliers to the company includes solely Browne Beéche & Co. in relation to rolling stock. That trading house based in Valparaiso and New York worked with Baldwin, and was one of the names in the succession from Hemenway & Browne through to Wessel Duval, who are still active.

The agreed complement of workers for each broad gauge line in May 1889 is also given as this will give some idea of the relative importance of each section and thus of the possible division of the fourteen locos had the works continued.

Santiago to Melipilla 59km.	700 workers
Pelequen to Peumo 25km.	200 workers
Palmilla to Alcones 45km.	250 workers
Coihue to Mulchen 45km.	375 workers
Victoria to Valdivia and Osorno 403km.	325 workers engaged on first section

[Contracts announced in *The Railroad & Engineering Journal*, vol. 63, Jan. 1889, p50], complements of workers found in [MOBR354].

Examination of the volumes of the *Boletin del Ministerio de Industria y Obras Públicas* for 1889 and 1890, available through the Hathi Trust website, should give a good indication of the rise and fall of this enterprise, as seen at each of its construction sites, albeit somewhat superficially.

1.8.2 Appendix 2: Information sent by Sr. Arturo (Arthur) Squire to P. C. Dewhurst in 1925-6

Arturo Squire had arrived in Chile in 1887 to work for the recently created *EFE* as a locomotive engineer. When contacted by Dewhurst he was living in retirement in Llo-Lleo near San Antonio. His notes have been transcribed carefully with no attempt made to correct spelling mistakes.

Hand-written notes received by PCD from AS, attached to the latter's letter of 10th April 1925 and following on from a list of loco names.

From recollections of old timers – unreliable –

southern Ry. #1.2.3.0.6.0 Hawthorn (one was probable mogul #83.....

116 was constructed from spares in Valpo, Rogers mogul and sent to Concepcion – 1886 –

57. Built in Valpo. from Avonside spare parts –

58. 59. reconstructed steam tenders – the other tender was scrapped.

17. 18. 19. 21. were 0.4.2, converted to 4.4.0 & later scrapped. I knew them as 4.4.0. & #20. 22 as 0.4.2.

67 & 82. Built in Valpo. from spares, after Peruvian war

116 Constructed in Concepcion in 1910 – the old engine was a Rogers 2.6.0.

83. plate frame mogul inside cylinders, built about 1885-8

35. Built in Valpo. from spares. 0.4.2 .

36 Built in Valpo. from spares 4.4.0

Old timers also say that # 1. 4. 5. 9. which figure as 4.4.0 on records, were originally 0.4.2. & were converted about 1873 on .

All early Hawthorn engines were 16" cylinders but we changed to 17" later & some to 18".

Double Chimneys This was an idea of Oscar Huber (Rogers man) to improve draft. The smokebox was divided vertically & two exhaust nozzles used. Did not result. I later redistributed the tubes in the bad steamers, suppressing about 6 to 8 tubes & spacing 3/4" instead of 5/8" base and leaving more space between tubes & boiler side, and got all the steam required & more.

Air Inlets. These were used to stop burning of smokebox door baffle plate. Worked well. The smoke boxes were small & the blast heavy. Later on they put a 3" pipe in front of exhaust pipe with a V cut at bottom & it cleaned the smoke box perfectly. (sketch at this point)

Old man McEwan is not very clear in his recollections. Most of these old timers moved about a good deal & lost track of what was done while they were in other divisions.

R.C.S. = Red Central Sur (Putendo, Donihue, Constitucion, Curico-Hualane branch lines) (Pencilled annotation saying 'Metre gauge')
R.C.N. = Red Central Norte (Calera to Pueblo Hundido)
The 5' 6" is all called the "Red Central" now.

The Valparaiso – Santiago Ry was built by the State

The Concepcion (Talcahuano) Curicó. was built by the State

The Santiago - Curicó was a private enterprise

When the Concepcion road reached Curico, the private line was taken over by the State.

The Valpo-Stgo. was called the F.C. del E. the private line. "Ferrocarril del Sud" and the southern road – "Ferrocarril Concepcion–Chillan – & later Concepcion–Curico – they were amalgamated in the name F.C. del E. ???

When I came to Chile in 1887. the passenger cars still carried the lettering F.C. del Sud – and F.C. del ???

At time of amalgamation all British locomotives were sent to Valparaiso, and all american to the Stgo. Concepn. line, and renumbered. Some retained their old numbers, & others got new ones, hence you get engines built in the -70ties with a higher numeration than engines built in the -80ties.

Also a considerable number of old locomotives scrapped themselves in rivers & collisions – and the numbers were filled either by engines built from spares or by new imports, and no record was kept. The Division Supts were the gods & only reported to the Minister till 1884, and if they had a few losses among their engines, they slung spares together in time for the annual balance. In the old days, a complete locomotive knocked down or not erected, was sent as spares with about every 4 locomotives purchased. About the only thing to do except erect the spares, was to lag the boiler & build a pilot.

Another thing was that the 5' 0" wheels & 5' 6" wheels were changed continually under the British engines. After repairs the engines started as 5' 6" express, and after some use were changed to 5' 0" passenger – so as to keep the best engines on the express –

38. From the name I should say this was originally a Hawthorne engine, but maybe it was scrapped and a new one erected from the Avonside spares – The name “San Felipe” should occur between # 45 & 46 if it is an Avonside, the numbers 43 to 46 being the small stations on the Los Andes branch, and the names San Felipe & Los Andes were evidently occupied when this bunch of engines were named.

A later letter from Squire to Dewhurst, responding to questions that had been asked.

Llo-Lleo, Chile

July 25 / 25 (possibly actually 1926)

Dear Mr. Dewhurst

Owing to change of residence and to washouts on railways and roads I only received your letter, and the carbon copy at the latter end of June, too late I am afraid for my answer to be of any use to you.

I have tried by correspondence with one or two old timers, to get the information you ask for, but the reply's I have received have been contradictory, and therefore of no value. I have not been able to go to Santiago myself as I have had a bad touch of “flu”, and at present it means a two days sojourn in 8° – with 10°C below zero every evening and no heating in Hotels, – too risky at my age –

Loco #66. Claro – I remember this engine on Stgo in 1888 as one very similar in.....
the “Maipu’ – 14"x24" + 5' 6" drivers – 4-4-0.

..... an old engine – Rogers or Baldwin – 67 “Montt”. I think the date is more probable as 1887 instead of 1877 – because in April 1888 they had to cut the deck plate because expansion of boiler jammed the rivet heads, and buckled the plate frame, causing side rods to heat, and to break. Such a defect could not have lasted long – unless a new boiler had been placed in 1888 – Still the old list is pretty reliable – [referring to a list of loco names and numbers that Squire had previously sent to Dewhurst]

Loco #82 “Contratista”. The old “Contratista” was an american engine, probably the Rogers you mention –

83 “Linderos”– The old “Linderos” was probably built in 1856, as you say, but the second one had a home made frame, and cylinders, boiler and motion from Hawthorne spares, and a homemade bogie– she was a brute–

91 “Hospital” and another sister engine, were bought by contractors, and may not figure in Roger’s list as being sup-

plied to the Chilean Rys– But the maker + date are right, as I took them myself from the number plate in 1889 – save that the boiler may have been changed

116 “Laja” This was a Rogers engine – date may be wrong– probably date put into service– Also may be one of several engines shipped from Perú in 1884 during the war– I know several locomotives were sent from Perú and perhaps this was one –

293 – 6 – If these do not figure in any of the blue..... you, they do not exist, but I think #293, and fancy it is a nacional built freight type perhaps – or a Lima Loco Works – from 0-4-2. Sharp Stewarts I have no record, but they should figure on the blueprints, if not scrapped – The Baldwin 0-6-2 (283-5) side tanks were bought by the D. O. P for construction use – they have since been turned over to the Ste. Ry and one is now the 117 –

I will try and get data of engines # 614 – 623 – 38 - 643 - 645 – 701 – Any no. over 740 must be Mikado, either broad or narrow gauge – 5' 6" Am Loco Co. metre Baldwin –

There is no diagram of # 316 – It was built without any drawings by the mechanic Alfred Deunet, who drew the motion and rods full size on a sheet of floor boarding The wheels and cylinders were spares – The wheelbase 16.3ft

I will try to get you a timetable for freight – failing that a passenger timetable – Also a map, if they are still in print – You may find one, very complete in the Chilean Embassy in London

I am sorry I am not able to do more at present, but my health broke up last year, and I am recuperating on the coast and nearly OK again, but am afraid to go up to Stgo– under the present conditions of travel, weather, and cold – the country has been washed out by 5 weeks continuous rains – as much as 4807mm in 5 days in one locality

Yours very truly

Arturo Squire

Sheets of notes received by PCD from AS in May 1928.

Loco no. 66 ‘Claro’ 4-4-0 American pass. 5' 6" d. wh. very similar if not same as loco ‘Maipu’ I sent you foto of.

" " 67 ‘Montt’. No trace of the old engine_ The Valparaiso-built engine should I think be 1887, as I saw it in for repair of construction defects in April 1888 and it was a practically new engine_ The wheels had been put in reversed and it ran forward with lever in back gear_ George Brunton said that was intentional and left it so!!! result it went into the turntable pit several times_

" " 82. “Contratista”_ The old Rogers went into the Bio Bio river with paymasters car, and stayed there. The new engine given that number was built in Valparaiso in 1886 or thereabouts, as it had general overhaul in 1891_

" " 83 “Linderos’_ Now a Balfour Lyon 4.4.0_ 18x24 6'ft d. wh_ what the original was I don't know, but an old driver here says he saw it as a 0.6.0, and later as a 2.6.0_ english type_

" " 91 “Hospital”_ I remember this engine as a Rogers and I think was a sister of #116. Swapping

numbers probable accounts for discrepancy with builders record. (pencilled addition: or sister to the "Cachapoal")

" " 116 "Laja" 2.6.0 Was a Rogers till quite recently, say ten years ago_ Date given by State Ry refer to year the engine entered service_ not to year of construction abroad_ a few years ago they built a new engine american type in Concepcion & gave it this number_ I think the new engine was 4.4.0 passenger 17x24

" " 122 "Varas". 0.6.0. Hawthorn_ was still going in 1901. now this # corresponds to a local factory engine.

Loco No_ 123. "Malleco" _ was a Rogers 2.6.0_ 18"x24" - 58" d. wh.

" " 124. "Panguilemo" was a Santiago. 4.4.0 american type engine, built in 1888_ I think_

" " 125 Anjel Prieto y Cruz", built I think in Valpo_ from spares.

" " 293-6_ North British freight built by the Caleta Abarca works in Valparaiso_

" " 173-180 Sharp Stewart_ 0.4.2_ No record of further acquisition of this type, nor any in service save the originals_

" " 283-5_ Cook 4.6.0_ the D.O.P. tanks numbered 283-5 now have numbers 117. 644. 645_

" " 614_ Vacant number _ no original_

" " 623-8 North British Freigh, local builders (Caleta abarca)

" " 643_ Diagram #62. Lima 4.4.0 cyl 381x550m/m_ d.wh. 1112m/m

" " 701-53 Alco Mikados_ type #70_ diagram inclosed

Diagram No_ 64_ none_ corresponds to 4 American Vulcan mogul engines, contractors engines,

" " 67_ none_ corresponds to 1 contractors 0.4.0 engine built by Manningwar(?)

" " Q_ could not procure a copy _ no B. Print available & original tracing mislaid.

The Tongoy Ry, is part of the Coquimbo Ry & runs from the port of Tongoy to Ovalle. metre gauge_ State Ry_

No diagram of engine #316_ I was a 0_6_0 with 16ft wheel base_ all else practically Hawthorn type_ boiler, cylinders, etc.

— . — . —

I notice you make no enquiries about the metre gauge lines - They are extensive, nearly as much as the broad gauge, and the engine types are legion, from 6 ton 0.4.0_ to 93 ton 4-10-2 Abt rack engines (tank)

1.8.3 Appendix 3: Feedback to Baldwin staff on the arrival of tipo 80 locos in 1938

The following letter and notes are attached to the Baldwin spec. sheets for the batch of *tipo 80* locos delivered to the EFE in 1938. Vol. 82 p688 onward. They reflect the thoughts of the Baldwin representative sent out to oversee the preparation of these engines for service, and as such give some insight into that role.

NB These letters were originally typed in upper-case letters throughout, but for ease of reading have been transcribed into upper- and lower-case letters here.

Santiago de Chile,
October 4th, 1938.

Mr. C. A. Campbell, Foreign Sales Manager,
The Baldwin Locomotive Works,
Paschal Station,
Philadelphia, PA., U.S.A.

Chilean State Railways, Locomotives 14-39 ¼E 1 to 7.

Dear Mr. Campbell:-

The work of preparing the above locomotives for trial and service has proceeded quite slowly, due principally to the time required for applying the grates. All locomotives are now in Santiago, the last having arrived from Valparaiso on the 30th inst. The trip was made without difficulties, and all engines arrived here in good shape.

At this writing, two engines, the 819 and 817 (14-39-¼-E 7 and 5 respectively) have had trial runs and are now in service. Another engine will be tried this afternoon.

The 819 was first tried on September 27th by running to Rancagua and return, a roundtrip distance of 164 kilometers. Everything ran beautifully for the first 45 kilometers of the out trip, then the engine driver became enthusiastic and pushed the engine up to 84 kilometers per hour for some ten or twelve kilometers with the result that the R-6 side rod bushing was very, very hot and smoking. We applied first aid, but to no avail and had to limp into Rancagua. By that time the bushing had seized the pin, so both back side rods were removed, and we returned to Santiago (82 kilms.) 'sin novedad' as a Pacific type engine.

A new bushing was applied the following morning, and that same afternoon another trial run was made over a circuitous route from Santiago to Paine, thence over a cut-off to Talagante, and from there back to Santiago, a total distance of about 85 kilometers. Up to Talagante (some 50 kilms. from Santiago over the route followed) everything was well, but there again the driver decided to stage a sprint and the same bushing again objected, heated and seized. This time, however, the pin keeper was removed, thus allowing the bushing to turn in the rod, and we arrived back in Santiago with everything perfectly cool.

A second new bushing was applied, and a third trial run. On this trip, after having run some 40 kilms., as everything was cool, it was decided to use the locomotive from here on to Rancagua to help out one of the German locomotives which had run into difficulties and was unable to proceed with its train. Said train was coupled to the 819 and delivered satisfactorily at Rancagua, the German engine following light behind. Upon arrival at Rancagua, everything was found to be in excellent shape so the new engine hauled another train back to Santiago, said train having a dead

weight of 450 metric tons. This return trip was made without difficulty, and the following day the locomotive was declared ready for service.

It is difficult to say why the R-6 rod bushing heated, and while some of the men around the roundhouse say it was because the R-6 driving box wedge was a little slack, I am inclined to think that the sprinting had something to do with it. Also that the original and first bushing applied here may have been a little snugger than the other rod bushings, therefore requiring more running in. I was not present when the rods were put on after applying the second new bushing, but have my suspicions that more play on the pin was allowed, and that this accounts for the meritorious performance on the third trip.

The 817, after having the driving box wedges carefully inspected for slackness, made the run from Santiago to Rancagua and return on the 30th ultimo, with no difficulties whatsoever, and at times, on the return trip, the driver in his enthusiasm over the new engine, shoved her up to 85 klms. Per hour. This engine went into service with a light passenger train on October 2nd.

I will report to you later regarding the trials of the remaining five engines, but before closing this letter, wish to call your attention to certain matters which I think it would be well to have on record for the future.

In my conversation with the master mechanic at San Eujenio – the roundhouse in Santiago where grates are being applied, etc., – and with locomotive inspectors who ride the locomotives during the trials, and engine drivers, I have been told of several small changes which have been made on most of the first 12 ‘mountains’ delivered in 1929, and which will be made in these seven new ones as soon as they are ready for service and are handed over to their regular crews.

These changes, for the most part, are details which are in no way a reflection on our design or workmanship, but considered necessary by engine drivers and mechanics here to better meet local conditions and methods of work. Everyone realizes that we are in no way responsible for not having incorporated same on the new engines, and that we were not advised they were required. As a matter of fact, some of these changes have not yet received the approval of the Departamento de Traccion y Maestranzas, nevertheless they have been and will be made.

The changes referred to, are listed on the attached sheets, and I suggest you keep them on file so that when the railways are again in the market for locomotives of this type, the question can be raised as to whether or not they desire them incorporated.

Trusting the foregoing will be of interest, and with kindest regards, I am,

Very truly yours,

C. G. Pinney

Original by steamer.

CC by airmail.

CC to Messrs. Wessel, Duval & Co.

1) Due most likely to inadequate maintenance and lack of spare parts, many of the engine drivers have found that the air operated cylinder cocks as applied to the original 12 ‘mountains] and the seven new ones, are not as practical as the old style hand operated cocks, and would have preferred the later on the new engines. Many of the original 12 engines have had this old type of cylinder cocks applied, although some are still using the original air operated type. All persons with whom I have spoken agree that the air operated type are easier to operate and provide a much freer exit to steam and water.

2) It was through an error on the part of the Tracción y Maestranzas department that the seven new engines were

specified to have Nathan Simplex type R lifting injectors. Everyone prefers the type supplied on the first 12 Mountains, which was the Nathan H.W. type F non-lifting.

- 3) Visors about three inches in height are applied to the front of stack at top in order to better deflect the smoke upwards when the engine is running. This is quite necessary as I have noticed on the trial runs that smoke is carried back into the cab, and drivers claim that these visors, when applied, eliminate a lot of this trouble.
- 4) Oil cavities at top of rear trailing truck boxes should have lids or covers to prevent entrance of water and dirt. Such covers have been applied to all of the original 12 Mountains and will be applied to the new ones.
- 5) The cast steel driving spring staples as supplied have small transverse ridges in the seat which are supposed to bear against the spring band and keep the spring from becoming unseated, or sliding forwards or backwards. In practice it has been found that these small ridges are insufficient to obtain this end, and to remedy this, the railway has welded to the top of each staple, at both front and back of the spring band pocket, a small piece of square steel, placed transversely, thus forming a pocket for the spring band with a lip at front and back of the same height as the side lips now cast integrally with the staples.
This could very easily be taken care of on future staples of this type by simply changing the pattern and casting the top lip all the way round the spring band pocket instead of only at the sides.
- 6) Brake heads supplied are not suitable for the type of replacement brake shoe which they use, and the brake pads (locomotive driver brake) of the original twelve engines have suffered some changes to make them adaptable. I understand, however, that the railway will now cast replacement brake shoes to suit brake heads as supplied.
- 7) All side and main rod grease plugs are changed to a type having a female square in top end and lock nuts are dispensed with.
- 8) Caps to all oil deposits in valve motion are altered by drilling out present oil holes and welding on a piece of 3/8" O.D. pipe about 1" long. Their objection to present caps is that oil they use will not pass quickly through small oil hole provided, and to make sure deposit is not dry, they must remove caps, which takes too much time. With 1" length of 3/8" pipe, though, enough oil can be added at each oiling to ensure deposit not running dry, regardless of how slow the oil added may pass into the deposit.
- 9) Oil cups are bolted to side of crossheads to oil small end of main rod. These are held by two studs and have a pipe leading through oil hole and discharging into oil cavity on front end of main rod.
- 10) Railway would prefer link blocks of brass, as same save the link from wear and are inexpensive to replace. With steel link blocks, they prefer that the top and bottom edges of the faces which make bearing against the link be bevelled slightly to avoid cutting the oil from the wearing surface of the link when position of reverse lever is changed.
- 11) Diagonal holes should be drilled in guide bar from at least one of the guide bar oil cups to lubricate flanges of top crosshead gibs.
- 12) There have been criticisms of our method of marking cut-off points on screw reverse gears. The numbers are merely stamped on the top surface of the gear frames, and I must admit it is not a very neat job. The stamping is uneven, and as the cut-off points are pretty close to one another, it is easy to become confused when desiring to hook up to one position or another. One of the inspectors pointed out to me the arrangement on the screw reverse of the German engines. On these there is applied a brass plate (cast) with embossed numbers and lines. There is no doubt but that it is neater and easier to read than ours.
- 13) Back headlight are changed to a position on the back face of the tender as in their present position, great care must be exercised when taking water, otherwise water spouts on water columns strike the headlight case.
- 14) Oil pockets on bottom crosshead gibs should have hinged or welded covers, as with cross wires as furnished which are supplied to hold the packing in place, same is thrown out and lost when running at 60 or more kilometers per hour.

1.8.4 Appendix 3: The *FCSV*'s response to the proposal that all three state-owned railways should use American locos and rolling stock

This document dates from 1874. It gives insight not only into the *FC Santiago Valparaiso* but also into the operation of two mining railways in the north of Chile, the standard gauge *FC de Chañarcillo* and the 3' 6" gauge *FC de Tongoi*. The background is that there were three independent but connected broad gauge lines, which a decade later in 1884 were combined into the *EFE*. One of the three, the *FCSV*, favoured British-built equipment (though adapted to their own needs), whilst the other two, the *FC del Sur* and the *FC Chillán, Concepcion y Talcahuano*, preferred US-built locos and stock. The *FCSV* had by far the most difficult operating conditions and route as it climbed up from the coast.

In 1873 the relevant ministry had produced a paper suggesting that all three largely government-owned lines should standardise on American equipment. This reply from Sr. Jorge Lyon, Superintendent of the *FCSV* (also referred to as the *Ferrocarril del Norte* in the report) disagrees vehemently. His arguments re locomotives make a lot of sense, for back then US locos were still cheap and cheerful and didn't last long. However, when he gets on to coaches and wagons his innate conservatism begins to show up. His comments on the relative weights of vehicles make sense but rubbishing bogie vehicles per se doesn't make sense. Note, incidentally, that the word 'bogie' hadn't yet entered the vocabulary and that he refers to '*avantren jiratorio*' and other convolutions. *Avantren* = a field gun's limber cart – not a word I had ever met before!

The original document is in file MINT670 at the *Archivo de la Nacion* facing Cerro Santa Lucía, adjacent to the Biblioteca Nacional on the Alameda.



*Departamento de Ingenieros
Valparaiso, Abril 21 de 1874.*

Por Superintendente :

En virtud de la nota de Vd. [Vuestra Merced] fha [de fecha] 3 de Junio del año ppdo [próximo pasado], referente al estudio que el Supremo Gobierno somete al Consejo Directivo de esta Empresa, sobre si debe adoptarse para el ferrocarril del Norte el equipo americano, en vista del buen resultado que segun se ha asegurado al Supremo Gobierno, ha obtenido dentro y fuera del pais el empleo de esa clase de equipo ; tengo el

Department of Engineers
Valparaiso, April 21st 1874

For the Superintendent

In accordance with your note of June 3 of last year, referring to the study that the Supreme Government submits to the Board of Directors of this Company, on whether American equipment should be adopted for the Northern railway, in view of the good result that, as the Supreme Government has been assured, has been obtained by the use of this type of equipment inside and outside the country; I have the honour to inform you that I

honor de informar a Vd. que, he estudiado la cuestion detenidamente, como era preciso en asunto tan importante y sobre el cual, una resolucion infundada, daría un resultado contrario al que se propone al Supremo Gobierno.

Los datos que he obtenido los someto mas abajo; es segun notaré Vd., se refieren principalmente a la locomotora, por ser esta, segun la nota del Señor Ministro del Interior, la cuestion capital que hai que resolver. Si comprendo bien dicha nota, se considera importante que exista un solo tipo de locomotora en todos los ferrocarriles del Estado. Llevar a cabo esta idea tendria desventajas mui grandes, porque se necesitan distintas locomotoras para trenes

de pasajeros y de carga, y para cada uno de estos, segun se quiera que sean de grande o de pequeña velocidad ; y tambien tipos especiales segun que la linea sea de fácil o de difícil explotacion. El servicio diario de una locomotora no debe pasar de 200 quilómetros, y es ventajoso que vuelva a su taller cada día.

Una línea tan estensa como la de Valparaiso a Angol, tendra por precision que explotarse en secciones con respecto al poder motor, segun se acostumbra en casos analogos. Cada seccion debe tener sus maquinistas, mecánicas, talleres y locomotoras con su jefe respectivo responsable de su estado y servicio. Las máquinas deben ser a proposito para la línea que recorren ; y es una ventaja para su económica reparacion, que las que frecuentan un misma taller sean identicas para cada clase de trenes. Pero que se haga esto estensivo a toda la línea, no puede convenir sino cuando ésta es idéntica en toda su lonjitud, y aun entonces esa uniformidad es de mui secundaria importancia.

Pasaré ahora a examinar los demas puntos que toca la nota aludida.

Se observará que las ventajas que se supone reportaría este ferrocarril adaptando las locomotoras del tipo norteamericano consistirian en un menor consumo de combustible, y como consecuencia, “en un aumento en la renta libre que esta línea prodiciria al Estado.

El principal fundamento que espresa la nota del Sr Ministro para creer que una máquina americana será mas económica que una del ferrocarril del Norte, es que se ha llevado una cuenta exacta del consumo de combustible entre una de aquel tipo y otra inglesa resultando que en igualdad de condiciones la americana consumió un tercio ménos de combustible que la inglesa.

have studied the question carefully, as was necessary in such an important matter and one on which an unfounded resolution would give a result contrary to that proposed by the Supreme Government.

I submit below the information which I have obtained; it is as you will notice, mainly referring to locomotives, as this is, according to the note from the Minister of the Interior, the principal question that has to be resolved. If I understand this note correctly, it is considered important that there be only one type of locomotive on all the state railways. Carrying out this idea would have very great disadvantages, because different locomotives are needed for trains

for passengers and for goods, and for each of these, depending on whether they are of high or low speed; and also special types depending on whether the line is easy or difficult to operate. The daily service of a locomotive should not exceed 200 kilometres, and it is advantageous that it returns to its depot every day.

A line as extensive as that of Valparaiso to Angol, will have to be worked in sections with respect to motive power, as is customary in similar cases. Each section must have its drivers, mechanics, workshops and locomotives with their respective chief responsible for their condition and service. The engines must be suitable for the lines they work; and it is an advantage for their economic repair that those that use the same workshop are identical for each class of trains. But that this should be made common over the entire line, can only be convenient when it is identical in nature throughout its length, and even then, that uniformity is of secondary importance.

I will now go on to examine the other points to which the note in question touches upon.

It will be observed that the advantages that this railway would anticipate by moving to locomotives of the North American type would consist of a lower consumption of fuel, and as a consequence, “in an increase in profit that this line would provide to the State.

The main basis expressed in the Minister's note, is the belief that an American engine will be more economical than one of the Northern railway, in that an exact account of the fuel consumption has been kept between one of that type and another English one, under the same conditions, with the result that the American consumed a third less fuel than the English. Before comparing the fuel

Antes de entrar a comparar el consumo de combustible entre las máquinas americanas e inglesas, me permito observar que el Señor Ministro ha partido de una base errónea al suponer que en el ferrocarril del Norte se ha adoptado el tipo inglés de locomotoras.

Los ejemplos que se han suministrado al Smo Gob. [Supremo Gobierno], de ferrocarriles en que las locomotoras americanas eran más económicas de combustible que las inglesas, aun siendo exactos, no tienen por consiguiente aplicación a esta línea, en donde se ha adoptado un tipo que difiere esencialmente de las máquinas inglesas y americanas.

Para operar, pues, un cambio radical en el tipo adoptado por este ferrocarril, se necesitan datos distintos a los espuestos en la nota del Señor Ministro. En cuanto a la economía de combustible, el Jefe de Locomotoras ha presentado un cuadro comparativo de lo consumido por las máquinas en los Estados Unidos y por las de esta línea, que es a favor de las de la última. Este cuadro no hace sin embargo suficiente justicia a su departamento, porque, 1^o. - en él van confundidas todas las máquinas que posee este ferrocarril, siendo las más económicas las del modelo adoptado y que no forman la tercera parte de la que la Empresa posee ; 2^o. - la lignita sólida que se emplea aquí en las máquinas, es muy inferior como combustible, al carbon de piedra de los Estados Unidos ; 3^o. - el tamaño medio de las máquinas de esta línea es superior al de las de Estados Unidos, y por consiguiente consumen más combustible que si fueren del mismo tamaño de las de este último país.

Debo también observar que de las locomotoras de esta línea las menos económicas de combustible son las que se aproximan al tipo americano, como es fácil verificarse consultando los estados mensuales que se llevan del consumo de cada máquina. Este hecho no es tampoco sorprendente, porque las máquinas americanas, en general, no se distinguen por su pequeño consumo de carbon comparadas con las inglesas. En frente de ello cito el ingeniero norte-americano Colburn, autor de una de las obras más completas que se han escrito sobre el asunto de que trato. Este Señor en su memoria sobre el equipo americano, publicada en 1869, dice en la página 7. "La economía de combustible no ha sido estudiada en locomotoras americanas hasta el grado que lo ha sido en las inglesas." El mismo autor explica en seguida este hecho en la baratura del excelente carbon de piedra que se consigne en los Estados Unidos y que hace innecesarios los gastos en aparatos para obtener

consumption between American and English engines, I allow myself to observe that the Minister has started from an erroneous base when supposing that the English type of locomotives has been adopted on the Northern railway.

The examples that have been provided to the Supreme Government, of railways in which the American locomotives were more fuel-efficient than the English, although being exact, do not therefore have application to this line, where a type has been adopted that differs essentially from the English and American engines. To put into effect, therefore, a radical change in the type adopted by this railway, data other than those set forth in the note from the Minister are needed. Regarding fuel economy, the Head of Locomotives has presented a comparative table of what is consumed by the engines in the United States and by those of this line, which is in favour of the latter. However, this table does not do enough justice to his department, because, 1st – all engines are mixed up in it owned by this railway, those of the adopted model being the most economical and which do not form one third part of those which the Company owns; 2nd – the solid lignite which is used here in the engines, is much inferior as fuel, to United States coal; 3rd – The average size of the engines in this line is greater than that of the United States, and therefore they consume more fuel than if they were the same size as those of the latter country.

DES Note – I think that the term solid lignite may be so described in order to differentiate it from peat.

I must also observe that of the locomotives of this line, the least fuel-efficient are those that are similar to the American type, and it is easy to see this by consulting the monthly statements that are taken of the consumption for each engine. This fact is not surprising either, because the American engines, in general, are not distinguished by their low consumption of coal in comparison with the English ones. In this I cite the North American engineer Colburn, author of one of the most complete works that has been written on the subject of which I treat. This gentleman, in his study of American equipment, published in 1869, says on page 7. "Fuel economy has not been studied in American locomotives to the degree that it has been in English engines." The same author immediately explains this fact by the cheapness of the excellent coal available in the United States and that it makes unnecessary the expense of devices to obtain fuel economy, which would result in increasing the weight

economía de combustible, los cuales darían por resultado aumentar el peso y el costo de las máquinas.

Los norte-americanos de reputacion no pretenden, por consiguiente, que sus máquinas sean mas económicas de combustible que las inglesas y con ménos razon podran pretenderlo sobre las adoptadas por este ferrocarril, en las que la cuestion de economía se ha estudiado por necesidad con suma perseverancia y felizmente con mui bien éxito, gracias a los trabajos y ensayos del ex-Jefe de Locomotoras Señor Mather.

Por otra parte, el ahorro en el consumo de carbon que se ha supuesto en la nota del Señor Ministro, aun siendo posible, no tendría el importante resultado que ella lo supone. Por ejemplo, en esta línea, el gasto de combustible, el gasto total de la explotacion y el capital del ferrocarril durante los últimos tres años, fué el siguiente :-

1	2	3	4	5	6
1871	\$14.752,533	\$863,300	\$103,677	77%	13%
1872	\$14.969,318	\$901,073	\$207,243	138%	23%
1873	\$15.322,259	\$1.111,026	\$264,843	173%	24%

1 = Año
 2 = Capital
 3 = Gasto total de explotacion
 4 = Gastos de combustible
 5 = Proporción entre 4 y 2
 6 = Proporción entre 4 y 3

En este estado estan incluidas todas las locomotoras que posee el ferrocarril siendo las antiguas, mucho mas consumidoras de combustible que las nuevas. Si cambiando las locomotoras se hubiera ahorrado un tercio del combustible, segun refiere la nota del Señor Ministro, el interes sobre el capital invertido en el ferrocarril habría aumentado en el año 1871 un cuarto (¼) por ciento; en 1872, un medio (½) por ciento; y en 1873 algo mas ; advirtiéndole que el precio del carbon de piedra en los dos últimos años ha sido casi el doble de lo que era en 1871, aun siendo de inferior calidad.

Ya he observado que la economía en consumo de combustible de nuestra máquinas varía segun su tipo. Sin embargo, la diferencia no es tan grande que pudiera justificar el abandono de las ménos económicas porque el ahorro de combustible con la adquisicion de otras de la mejor clase, no alcanzaría a cubrir el interes del capital que se podría [podría] inutilizándolas.

and cost of the engines.

Reputable North Americans do not claim, therefore, that their engines are more fuel efficient than English ones, and with even less reason could they claim it over those adopted by this railway, in which the question of economy has been studied of necessity with extreme perseverance and happily with very good success, thanks to the work and trials of the ex-Head of Locomotives Mr. Mather.

On the other hand, the saving in the consumption of coal that has been assumed in the note of the Minister, even if possible, would not have the important result that he supposes. For example, in this line, the cost of fuel, the total cost of working and the capital of the railway during the last three years, was as follows: -

1	2	3	4	5	6
1871	\$14.752,533	\$863,300	\$103,677	77%	13%
1872	\$14.969,318	\$901,073	\$207,243	138%	23%
1873	\$15.322,259	\$1.111,026	\$264,843	173%	24%

1 = Year
 2 = Capital
 3 = Total costs of exploitation
 4 = Fuel costs
 5 = Ratio between 4 and 2
 6 = Ratio between 4 and 3

In this statement all the locomotives that the railway owns are included, the old ones being much more fuel consuming than the new ones. If changing the locomotives would have saved a third of the fuel, according to the note from the Minister, the interest on the capital invested in the railway would have increased in 1871 by a quarter (¼) percent; in 1872, one half (½) percent; and in 1873 a little more; noting that the price of coal in the last two years has been almost double what it was in 1871, even though it was of inferior quality.

I have already observed that the economy in fuel consumption of our engines varies according to their type. However, the difference is not so great that it could justify the abandonment of the less economical because the fuel savings resulting from the acquisition of others of the better class, would not cover the interest on the capital which would render them useless.

En vista de este resultado no sera difícil comprender que la economía de combustible, aunque no debe despreciarse, no es de tan alta importancia en nuestra línea y en otras, como lo es el que las locomotoras no sufran continuas descomposturas, y que puedan ejercer una gran fuerza de traccion. Entonces estos puntos la máquina adoptado por el ferrocarril del Norte, sobresale, segun paso a detallarlo :-

1^o.- Consumo de combustible – Estas máquinas se emplean todo el año entre Santiago y Valparaiso, arrastrando trenes de 24 carros cargados, cuyo peso varía poco de 300 toneladas. El consumo medio por los dos años 1871 y 1872 fué de 14¾ quilógramos por quilómetro corrido. Segun el ingeniero norte-americano Colburn, las locomotoras americanas de ménos fuerza consumen mas del doble de esta cantidad (véase las pájinas 8 y 9) de escelente carbon de piedra, mientras que el combustible de este ferrocarril no es sino una lignita comparativamente mui de inferior calidad.

2^o.- Solidez de su construccion – Sobre este punto no necesito estenderme, por que ya repetidas veces, al hacer presente la urjante necesidad de aumentar el equipo se ha demostrado hasta la evidencia que es las máquinas, aun sin tomar en cuenta las dificultades de la línea, hacer un servicio doble, y sin embargo, como a Vd. le consta, rara vez necesitan entrar a los talleres para la refaccion de algunas de su piezas.

3^o.- Fuerza de traccion.- La que estas locomotoras desplegan diriamente en verano e invierno, dia y noche, es de subir 360 toneladas, incluso su propio peso (o 300 escluyendolo) sobre una gradiente de mas de 19 por mil (1 en 52) o de 100 pies por milla y en una lonjitud de 1550 metros por curvas cerradas de 300 metros de radio. El mismo peso arrastran diariamente por otra subida de 15½ por mil (1 en 65) o 81 pies por milla, en 4 quilómetros de lonjitud. Las locomotoras que hacen este extraordinario servicio pesan 36 toneladas, tienen solamente cuatro ruedas motoras de cinco pies de diámetro con 22 toneladas sobre ellas, y cilindros de 17½ pulgadas. Este no es, sin embargo, el límite del peso que estas locomotoras pueden arrastrar, porque aun de noche, en presencia del Jefe de Locomotoras del ferrocarril del Sur, han subido por la gradiente de 15½, o 81 pies por milla arrastrando 348 toneladas fuera de su propio peso que con tender es de 60 toneladas, esto es en junto 408 toneladas.

Vamos a ver ahora lo que arrastra una locomotora americana de la mejor clase y de dimensiones iguales a

In view of this result, it will not be difficult to understand that fuel economy, although it should not be neglected, is not of such high importance in our line and in others, and factors such as the locomotives do not suffer continuous breakdowns, and can exert a great tractive effort. Then these points the engine adopted by the Northern railway, stand out, according to these details: –

1st – Fuel consumption – These engines are used all year between Santiago and Valparaiso, pulling trains with 24 loaded wagons, whose weight fluctuates around 300 tons. The average consumption for the two years 1871 and 1872 was 14¾ kilograms per kilometre travelled. According to the North American engineer Colburn, less powerful American locomotives consume more than double this amount (see pages 8 and 9) of excellent coal, while the fuel of this railway is nothing but a lignite of comparatively a very inferior quality.

2nd – The strength of their construction – On this point I do not need to continue, because already repeatedly, when the urgent need to increase the equipment, it has been shown up in evidence that it is the engines, even without taking into account the difficulties of the line, undertake a double service, and yet, as you know, rarely need to enter the workshops for the repair of some of their components.

3rd – Tractive effort. – The effort that these locomotives deploy daily in summer and winter, day and night, is to lift 360 tons, including their own weight (or 300 excluding it) up a gradient of more than 19 per thousand (1 in 52) or 100 feet per mile and in a length of 1550 metres with tight curves of 300 metres radius. The same weight is hauled daily on another climb of 15½ per thousand (1 in 65) or 81 feet per mile, over a distance of 4 kilometres. The locomotives that perform this extraordinary service weigh 36 tons, have only four five-foot diameter driving wheels with 22 tons on them, and 17½-inch cylinders. This is not, however, the limit of the weight that these locomotives can haul, because even by night, in the presence of the Chief of Locomotives of the Southern railway, they have climbed the gradient of 15½ [%], or 81 feet per mile hauling 348 tons above their own weight that with tender is 60 tons, that is all together 408 tons.

Let us now see what an American locomotive of the better class and of dimensions equal to those mentioned

las aludidas. Lo adjunto un catálogo ilustrado de la acreditada fábrica de Baldwin de Filadelfia, recientemente publicado, que es considerada una de las mejores, sino es la mejor fábrica de Estados Unidos. En la página 65 se dan las dimensiones de una máquina que se aproxima dentro de un 6p% [6%] a las del tipo adoptado por el ferrocarril del Norte.- El fabricante se compromete a que una máquina de estas dimensiones en una línea recta y en buena condición (veáse la páj. 50) arrastre en una gradiente de 100 pies por milla 130 toneladas incluso el peso de los carros, peso esclusivo el de la máquina y su tender ; y en una gradiente de 80 pies por milla un peso de 165 toneladas.

Las máquinas del tipo adoptado en el ferrocarril del Norte arrastran por consiguiente el doble de las mejores locomotoras norte-americanas de iguales dimensiones; así fines, se tendría en el ferrocarril del Norte que aumentar casi en el doble el número de trenes actuales si se adoptara las máquinas americanas referidas. Apénas necesito insinuar el considerable aumento que habría en los gastos de explotación debido a este solo hecho, y el serio inconveniente que ofrecería en ferrocarril como éste de una sola via el aumentar como sería de necesidad el número de los cruzamientos de trenes.

La superioridad de la fuerza de tracción de las máquinas adoptadas por el ferrocarril del Norte se ha demostrado recientemente de una manera palmaria con el tren de equipo misto arrastrado por una locomotora americana que en la actualidad recorre nuestra línea cada dos días, sustituyéndola en los intermedios una de las locomotoras ordinarias del ferrocarril del Norte con equipo ingles. En la prueba que se hizo por orden del Supremo Gobierno durante dos días consecutivos en presencia de una comisión compuesta de los Jefes de Locomotoras de las Empresas del Norte y Sur, resultó : – que las locomotoras ordinarias de la línea del Norte trasportaban un veintiuno por ciento (21p%) y posteriormente 38p% mas de carga que la mas poderosa que posee el ferrocarril del Sur, no obstante que esta, por las dimensiones de su mecanismo, debía trasportar un peso mucho mayor que aquella, siendo igual en ambas la presión del vapor. La máquina americana aludida es la “Contratista” que fué mandada fabricar por su primitivo dueño Don Enrique Meiggs a todo costo para el servicio de la línea del Norte cuya construcción tenía contratada en es época. Esta máquina es de un tipo semejante a la inglesa de Chañarcillo y a las remolcadoras del ferrocarril del Norte. Desde que la compró la línea del Sur, ha sufrido

may haul. Attached is an illustrated catalogue recently published of the Baldwin factory in Philadelphia, which is considered one of the better, if not the best, factory in the United States.

On page 65 are given the dimensions of a engine that approximates within 6% to those of the type adopted by the Northern railway. The manufacturer undertakes that a engine of these dimensions on a straight line and in good condition (see page 50) will haul on a gradient of 100 feet per mile, 130 tons including the weight of the wagons, exclusive of the weight of the engine and its tender; and on a gradient of 80 feet per mile, a weight of 165 tons.

Engines of the type adopted on the Northern railway therefore haul twice that of the best North American locomotives of the same size; thus, it would be necessary to increase the number of current trains in the Northern railway to almost double if the American engines referred to were adopted. I just need to hint at the considerable increase in operating costs which would be due to this fact alone, and the serious inconvenience it would offer in a railway such as this single line, as it would be necessary to increase the number of train crossing places.

The superiority of the tractive effort of the engines adopted by the Northern railway has recently been demonstrated in a clear way by the mixed train hauled by an American locomotive that currently runs our line every two days, replaced on the intervening days by one of the ordinary English-built locomotives of the Northern railway. In the test that was carried out by order of the Supreme Government for two consecutive days in the presence of a commission composed of the Heads of Locomotives of the railway companies of the North and South, resulted in: – that the ordinary locomotives of the North line carried twenty-one per cent (21%) and later 38% more cargo than the most powerful that the Southern railway possesses, despite the fact that this, due to the dimensions of its mechanism, had to transport a much greater weight than that, the pressure of the steam being equal in both. The aforementioned American engine is the "Contratista" that was ordered to be manufactured by its original owner, Don Enrique Meiggs, at his own expense for the service of the North Line, whose construction of which was contracted at that time. This engine is of a type similar to the English one in Chañarcillo and to the banking engines of the Northern railway. Since the South line bought it, it has undergone

modificaciones y ha sido notablemente mejorada ; debe, por consiguiente, considerarse como mui superior al tipo ordinario de locomotoras americanas. La “Contratista,” lo mismo que las remolcadoras de la línea del Norte, se ha fabricado para arrastrar un gran peso a pequeña velocidad y aunque por un poco de tiempo podrá, lo mismo que las remolcadoras aludidas, correr entre Sant^O y Valparaiso desplegando toda la fuerza, no podrá, sin embargo, continuar mucho tiempo el mismo servicio sin serios deterioros; así que, aunque hubiera demostrado ser mas poderosa que las que ordinariamente corren entre Sant^O y Valparaiso como debió haber sucedido por las dimensiones de las piezas que influyen en la fuerza de traccion de una máquina, no por eso hubiera convenido adoptarla para correr entre Sant^O y Valparaiso, por la misma razon que no conviene colocar entre esos puntos las remolcadoras del Norte, que son mucho mas poderosas que sus locomotoras ordinarias.

Que la “Contratista,” no obstante sus ventajas en cuanto a traccion haya arrastrado un peso menor que las ordinarias del Norte, demuestra evidentemente la inferioridad de las mejores máquinas fabricadas en los Estados Unidos a las fabricadas en Inglaterra confirme al tipo adoptado en el ferrocarril del Norte.

En cuanto a solidez de construccion creo estar en la verdad de los hechos, si afirmo que se ha gastado en refacciones de la “Contratista” diez veces mas de lo invertido en las máquinas de tipo adoptado en el ferrocarril del Norte, por igual peso arrastrado a igual distancia y esto en una línea de mucho mas fácil explotación que la del Norte. Como se acostumbra llevar una cuenta de las reparaciones que exige cada locomotora será fácil cerciorarse de este hecho.

La máquina en uso del ferrocarril del Norte, disminuyendole el diámetro de las ruedas, y aumentando su número, es capaz de arrastrar un peso mucho mayor sobre las gradientes mencionadas, pero a trueque de perder en duracion lo que ganaría en fuerza, a causa de la mayor velocidad, con que se moverían las piezas del mecanismo. Una modificacion en este sentido sería, por consiguiente, de dudosa ventaja.

La máquina tipo de que me ocupo es debida a los estudios y a la esperiencia de los mui inteligentes jefes de locomotoras que la ha cabido en suerte a este ferrocarril tener a su servicio ; y a ellos es debido el grado de fuerza, la economía y durabilidad por la cual se distinguen dichas locomotoras, y que sería mui difícil

modifications and has been significantly improved; it must, therefore, be regarded as much superior to the ordinary type of American locomotive. The “Contratista” like the banking engines of the North line, has been manufactured to haul a large load at a low speed and although for a short time it will be able, like the banking engines mentioned, to run between Santiago and Valparaiso, deploying all available strength, however, it will not be able to continue the same service for a long time without serious wear. So, although it would have been shown to be more powerful than those that ordinarily run between Santiago and Valparaiso, as it should have happened due to the dimensions of the components that influence the tractive effort of an engine, it would not have been appropriate to adopt it to run between Santiago and Valparaiso, for the same reason that it is not convenient to use between those points the banking engines of the North, which are much more powerful than their ordinary locomotives.

That the “Contratista” despite its advantages in terms of traction, has carried a lesser weight than the ordinary ones of the North, evidently demonstrates the inferiority of the best engines made in the United States compared to those made in England and confirms the type adopted on the Northern railway.

Regarding solidity of construction, I think I am close to the truth, if I affirmed that on parts of the “Contratista” ten times more has been spent than has been expended in the engines of the type adopted on the Northern railway, for the same weight hauled an equal distance, and this on a line of much easier operation than that of the north. As it is customary to keep an account of the repairs required by each locomotive, it will be easy to verify this fact.

The engine in use on the Northern railway, by reducing the diameter of the wheels and increasing their number, is capable of hauling a much greater weight on the gradients mentioned, but in exchange for losing in durability what it would gain in effort, due to the higher speed with which the parts of the mechanism would move. A change in this direction would therefore be of dubious advantage.

The type of engine that I am dealing with resulted from the studies and the experience of the many intelligent locomotive managers that this railway have been lucky to have at their service; and to them is due the degree of strength, economy and durability by which the said locomotives are distinguished, and which would be very

encontrar en otras, segun se ha demostrado. Como estas máquinas difieren de todas las obras conocidas, ha sido preciso al mandarlas fabricar en Europa, remitir los diseños y planos con todo sus detalles y una especificacion mui completa ; documentos que se varían de tiempo en tiempo segun las mejoras que, enseñadas por la experiencia, se introducen en ellas todos los años. Merece la mui sería consideracion de Vd. el hecho de si, el haberse segun este sistema de estudio, ha sido un error o si, por el contrario, hubiera sido preferible haber encargado las máquinas sin plano ni especificacion a un fabricante extranjero, corrienda el albur de que nos remitiesen locomotoras inaparentes para el tráfico de esta línea. A mi juicio, una medida de esta clase sería fatal para las intereses de la Empresa ; porque no es posible que un fabricante extranjero pueda estimar con exactitud los pormenores del trayecto, la naturaleza del combustible y la calidad del agua que se tiene que emplear, como así mismo otro mil detalles de una explotacion, que no se pueden conocer debidamente sino por los encargados de las locomotoras.

Creo haber espuesto lo suficiente para indicar el peligro que se correría en este ferrocarril de tan difícil explotacion, si se cambiarse el tipo de locomotora que le ha dado tan espléndidas resultados, sin hacer previamente la seguridad el que el tipo que se quedando sustituir es superior a aquel en los requisitos que son indispensables para una económica y segura explotacion, tanto mas cuanto que el tipo propuesto ha demostrado ser siempre inferior al que ya posemos.

Segun ya he observado solamente tenemos una tercera parte de nuestro equipo conforme al diseño adoptado, quedando las primeras locomotoras en número de diez (con las cuales se abrió la línea hasta Quillota) de uno de los tipos ingleses, si bien modificado para el consumo del combustible del país. Estas locomotoras que son construidas para el empleo del coke que no se usó en ellas aquí a causa de su costo, y por muchos años corrieren consumien de carbon ingles, con gran detrimento de su fuerza de traccion, hasta que el Señor Mather, ex-jefe de Locomotoras, las modificó para el económico consumo de carbon del país, y mediante sus modificaciones, pudieron ejercer la fuerza para la cual fue son construidas.

Será útil averiguar si conviene conservar estas máquinas o si no sería preferible abandonarlas; porque, segun los ejemplos suministrados al Supremo Gobierno y contenidos en la nota del Señor Ministro, todo abandono

difficult to find in others, as has been shown. As these engines differ from all known models, it has been necessary when having them manufactured in Europe, to submit the designs and plans with all their details and a very complete specification; documents that vary from time to time according to the improvements that, taught by experience, are introduced into them every year. It would be worth your very serious consideration, the fact that having followed this logic, it would be an error if, on the contrary, the choice was made to order the engines, without a blueprint or specification from a foreign manufacturer, encouraging us to obtain inappropriate locomotives for traffic on this line. In my opinion, such a measure would be fatal to the interests of the company; because it is not possible for a foreign manufacturer to accurately estimate the details of the journey, the nature of the fuel and the quality of the water to be used, as well as a thousand other details of our operations, which cannot be properly known except by the locomotive managers.

I think I have shown enough to indicate the danger that would be arise on this railway of such difficult operation, if the type of locomotive were changed that has given i such splendid results, without previously assuring that the type that remains to be replaced is superior to that in the requirements that are indispensable for economic and safe operation, all the more since the proposed type has always been shown to be inferior to the one we already possess.

As I have already observed, only a third of our equipment is according to the adopted design, leaving the first ten locomotives (with which the line to Quillota was opened) of one of the English types, although modified for the consumption of this country's fuel. These locomotives were built for the use of coke that is not used in them here because of the cost, and for many years they ran consuming English coal, with great detriment to their tractive effort, until Señor Mather, ex-Head of Locomotives, modified them for the economic consumption of this country's coal, and through their modifications, they were able to exert the tractive effort for which they were built.

It will be useful to find out if it is acceptable to maintain these engines or if it would not be preferable to abandon them; because, according to the examples provided to the Supreme Government and contained in the note from the

del equipo ingles, no obstante la perdida inmediata que ha ocasionado, ha redundado mas tarde en beneficio para las empresas. "Este resultado es, sin embargo, tan contrario a los datos que poseia yo sobre las ventajas comparativos de ambos equipos, datos obtenidos tanto en obras norte-americanas como europeas, y sobre todo en estudios prácticos en nuestro pais, que me he tornado algun empeño en averiguar la exactitud de los ejemplos aducidos en prueba por el Señor Ministro, y he arribado a un resultado mui distinto del que asevera la nota de mi referencia.

Allí se dice : – "El gran ferrocarril del Canadá ha cambiado por americano su antiguo equipo ingles haciendo enormes sacrificios, puesto que el equipo abandonado imputaba muchos millones, y apesar de esto, el cambio se ha traducido en mayores rendimientos para la empresa." Este ejemplo encierra una gran equivocacion, porque, segun se trasluce, todo la mayor parte de su equipo se supone que en un tiempo fué ingles, mientras que el hecho efectivo es que, en su principio, todo el equipo, incluso locomotoras, coches y carros fué americano ; y ha sido solo posteriormente cuando se han ido introduciendo locomotoras inglesas en una proporcion siempre creciente. En el año pasado, de 36 locomotoras que poseia ese ferrocarril, se comprarian aproximadamente por terceras partes, de americanas, canadienses e inglesas.

La desgraciada historia de esta empresa, como negocio, es bien conocida. En su principio fué simplemente un ferrocarril dentro de los Estados Unidos, de 240 quilómetros de longitud, llamado el "Atlantico y San Lorenzo." Esta línea fué arrendada en 1853 con todo su equipo (que naturalmente era americano y con talleres para la fabricacion del mismo) por la Compañía que en 1859 lo prolongó al travez del Canadá. Posteriormente la misma Compañía arrendó otro ferrocarril americano en el occidente de los Estados Unidos (el llamado Detriot y Port Huron) así que el "Grand Trunk" en 1859 tenía su centro en el Canadá y sus extremos en los Estados Unidos, porque su principal objeto era trasportar los productos del occidente de este pais a su ribera del Atlantico para que fueren en último termino conducidos a Europa. En 1859, cuando se abrió la línea de oriente a poniente sin interrupcion, su equipo consistía, segun se veía en el informe de dicho ferrocarril por ese año, que adjunto, (cuadro C.) en 110 locomotoras americanos, 43 fabricadas en el Canadá y 50 inglesas, o por toda 203 locomotoras. En 1871 el número de máquinas había

Minister, any abandonment of the English equipment, despite the immediate loss it has caused, has later led to benefits for the companies. "This result is, however, so contrary to the data that I had on the comparative advantages of such equipment, data obtained both in North American and European works, and especially in practical studies in our country, that I have made some effort to find out the accuracy of the examples adduced in evidence by the Minister, and I have arrived at a result that is very different from that found in the note of my instruction.

There it is said: – "The great Canadian railway has changed its former English plant for American, making enormous sacrifices, since the abandoned plant involved many millions, and despite this, the change has translated into higher returns for the company." This example contains a big mistake, because, according to what is revealed, all of the major part of his equipment is supposed to have been English at one time, while actually initially is that, in principle, all the equipment, including locomotives, coaches and wagons was American; and it was only later that English locomotives were introduced in an ever-increasing proportion. In the past year, of 336 locomotives owned by that railway, they would be bought about one third each, American, Canadian and English.

The unfortunate story of this Company, as a business, is well known. Originally, a 240-kilometre long railway within the United States was called the "Atlantic & St Lawrence." This line was leased in 1853 with all its equipment (which was naturally American and with workshops to manufacture it) by the Company, which in 1859 extended it across Canada. Subsequently the same Company leased another American railway in the western United States (the so-called Detriot and Port Huron) so the "Grand Trunk" in 1859 had its centre in Canada and its ends in the United States, because its main objective was to transport the products of the western part of this country to its Atlantic shore so that they would ultimately be shipped to Europe. In 1859, when the line from east to west was opened throughout, its equipment consisted, as will be seen in the report of that railway for that year, which I enclose (Table C.) in 110 American locomotives, 43 manufactured in the Canada and 50 English, or in total 203 locomotives. In 1871 the number of engines had increased from 336, according to the manual of the railroads of the United States, from Poor, corresponding

aumenta de a 336, según aparece del manual de los ferrocarriles de los Estados Unidos, de Poor, correspondiente a los años 1872-1873, pág. 454. Las 133 adicionales consistían en algunas compradas en los Estados Unidos, pero casi todas en máquinas fabricadas en el Canadá y la Gran Bretaña. Las adquiridas en este último país, salieron de los talleres de Fairbairn, de Slaughter y Neilson; las últimas, en número de 25, se fabricaron en el año 1868, y se encuentran diseñadas y descritas en la publicación "Engineering" de 20 de Marzo del año mencionado.

Este último hecho demuestra por sí solo que el "Grand Trunk" no ha podido abandonar el equipo inglés y que muy al contrario este debe haber dado un resultado muy superior al americano cuando ha sido preferido, no obstante que su costo se recargaba con los gastos de desarme, fletes, derechos de importación y armadura en el Canadá, gastos que se habrían vitado si estas máquinas se hubieron fabricado en los Estados Unidos. Es evidente entonces, que si los rendimientos del "Grand Trunk" son mayores, la causa no es la supuesta en la nota del Señor Ministro, porque el equipo inglés en lugar de haber sido abandonado ha sido aumentado en mayor proporción que el americano.

Paso a examinar con satisfacción los párrafos de la nota relativos a los ferrocarriles de Chañarcillo y de Tongoi, porque estando en nuestro país es más fácil comportar todo dato referente a ellos.

El párrafo aludido de la citada nota del Señor Ministro dice así: –

"En efecto, los ferrocarriles de Chañarcillo y de Tongoi usaron al principio el sistema inglés, y como resultado, obtuvieron esas empresas pérdidas enormes.

Resolvieron a cambiar de sistema y desde que emplearon el americano han pedido distribuir buenos dividendos entre sus socios."

El ferrocarril de Chañarcillo se compró por el de Copiapó a fines del año 1868. En el informe anual de esta línea correspondiente a este año, pág. 35 se encuentra el acta de la junta general de accionistas en la que se aprobó dicha compra. Consta allí también, que, según los Directores, Superintendente, Jefe de Talleres e Ingeniero del Ferrocarril de Copiapó, el de Chañarcillo tenía una entrada neta de 18 a 20 mil pesos anuales, en los años anteriores a la fecha de la compra; y los mismos, calculaban que una vez dueño el de Copiapó del de Chañarcillo las entradas netas pasarían de 30 mil pesos, "realizando las economías que pueden obtenerse

to the years 1872-1873, page 454. The additional 133 consisted of some purchased in the United States, but almost all of them made in Canada and Great Britain. Those acquired in the latter country, were from the Fairbairn, Slaughter and Neilson workshops; the last, amounting to 25, were manufactured in 1868, and are discussed and described in the "Engineering" publication of March 20 of the said year.

This last fact alone shows that the "Grand Trunk" has not been able to abandon English equipment and that, on the contrary, it must have given a much better result than the American when it was preferred, despite the fact that its cost included the cost of dismantling, freight, import duties and erection in Canada, expenses that would have been avoided if these engines had been manufactured in the United States. It is evident then, that if the yields of the "Grand Trunk" are higher, the cause is not the one supposed in the note of the Minister, because the English equipment instead of having been abandoned has been increased to a greater extent than the American.

I turn to examine with satisfaction the paragraphs of the note related to the railways of Chañarcillo and Tongoi, because being in our country it is easier to scrutinise all data referring to them.

The relevant paragraph of the aforementioned note from the Minister says thus: -

"Indeed, the Chañarcillo and Tongoi railways initially used the English system, and as a result, these companies made huge losses. They resolved to change the system and since they used the American they have distributed good dividends to their shareholders."

The Chañarcillo railway was bought by the Copiapó railway at the end of the year 1868. In the annual report of this line corresponding to this year, p. 35 are the minutes of the general shareholders' meeting in which the said purchase was approved. There is also evidence that, according to the Directors, Superintendent, Head of Workshops and Engineer of the Copiapó Railway, that of Chañarcillo had an income of 18 to 20 thousand pesos per year, in the years prior to the date of purchase; and they calculated that once the owner of Copiapó and that of Chañarcillo had a net income of more than 30 thousand pesos, "Realizing the savings that can be obtained in

en los gastos con la supresion de la maestranza que aquella compañía tenía en Pabellon y con la de varios empleos innecesarios-” Esto mui bien se comprende. Un ramal se puede esplotar con mucha mas economía por la línea principal que por se mismo.

Segun se notará, no se contaba con ninguna economía en la sustitucion de las máquinas. La recomendacion del Directorio fué aprobada por los accionistas, y el ferrocarril de Chañarcillo fué comprado el 10 de Noviembre de 1868 por 138 mil pesos, habiendo importado mas de un millon a sus dueños anteriores.

Una vez la línea de Copiapó en posesion de la de Chañarcillo, se retiraron a causa de su mal estado las locomotoras inglesas que hacían el servicio de esta línea y que eran las Nos. 22, 23 y 24, siendo sustituidas por las No. 19 y 20 norte-americanas. (véase el informe de 1868 páj. 14) Durante los años 1869 y 1870 el tráfico del ramal se verificó por estas locomotoras norte-americanas (véase el informe de esas épocas páj. 14 y 11 de los años respectivos). En estos años se llevó una cuenta reparada de las entradas y gastos del ferrocarril de Chañarcillo, así que es fácil averiguar si el empleo de las locomotoras norte-americanas tuvo el importante efecto que se supone en la nota del Señor Ministro, aumentando las ganancias de la línea. Recordaré que el ferrocarril de Copiapó tomando por base la entrada liquida del de Chañarcillo, calculaba que esta línea dejaría una entrada neta de 30 mil pesos, suprimiendo la maestranza y algunos empleos; sin embargo, la entrada nota de 1869 fué solamente de 22,310 pesos, y la de 1870, 17,912 pesos, o un término medio en los dos años de 20,111 pesos anuales (véase los informes de 1869 y 1870, páj. 14 y 11).

Resulta entonces que esplotado el ferrocarril de Chañarcillo por sí misma dejada una ganancia anual de 18 a 20 mil pesos, y siendo esplotado por el de Copiapó con el ahorro considerable que tenía que resultar en su administracion, no dió sino 20,111 pesos. Es claro por este resultado que las máquinas no causaron el sorprendente efecto que se los ha supuesto, y lo que es mui significativo es el hecho que 1871 se quitaron esas máquinas de la línea de Chañarcillo y tomaron su lugar las inglesas que ántes habian hecho el mismo servicio, es decir, las Nos. 22 y 24 (véase el informe de 1871 páj. 11 y cuadro No. 8) La cuenta separada que por sus productos y gastos se formaba a la línea de Chañarcillo fué suprimida por orden del Directorio desde el 1º de Enero de 1871, así que nadie conoce la ganancia que ha tenido esta línea despues del año 1870 (véase el informe de

expenses with the closure of the workshops that company had in Pabellon and elimination of several unnecessary jobs." This is very well understood. A branch can be worked with much more economy along with the main line than by itself.

As will be noted, there was no economy in the substitution of the engines. The recommendation of the Board of Directors was approved by the shareholders, and the Chañarcillo railway was purchased on November 10, 1868 for 138 thousand pesos, having cost its previous owners more than a million.

Once the Copiapó railway was in possession of the Chañarcillo line, the English locomotives that served this line and which were Nos. 22, 23, and 24, were withdrawn owing to their poor condition, being replaced by Nos. 19 and 20 of North American origin (see the 1868 report page 14). During the years 1869 and 1870 the branch traffic was operated by these North American locomotives (see the report of those times pages 14 and 11 of the respective years). In these years a corrected account of the entries and expenses of the Chañarcillo railway was kept, so it is easy to find out if the use of North American locomotives had the important effect that is supposed in the note of the Minister, increasing the profits of the line. I recall that the Copiapó railway, based on the net income of the Chañarcillo, calculated that this line would leave a net income of 30 thousand pesos, by eliminating the workshops and some jobs; however, the income note for 1869 was only 22,310 pesos, and that of 1870 17,912 pesos, or an average in the two years of 20,111 pesos per year (see reports of 1869 and 1870, pages 14 and 11).

It turns out then that the Chañarcillo railway when operated on its own brought in an annual profit of 18 to 20 thousand pesos, and on being worked by the Copiapó railway, with the considerable savings that had resulted in its management, brought only 20,111 pesos. It is clear from this result that the engines did not cause the surprising effect that they have been supposed to have had, and what is very significant is the fact that in 1871 those engines were removed from the Chañarcillo line and the English engines, which formerly fulfilled that role, then had taken their place, that is, Nos. 22 and 24 (see the report of 1871, page 11 and table No. 8). The separate account of income and expenses of the Chañarcillo line was deleted by order of the Directorate from January 1, 1871, so nobody knows the profit that this line has made after the year 1870 (see the report of

1870 pág. 13) ; pero es claro que no se habrían vuelto a colocar las máquinas inglesas en lugar de las norteamericanas, después de la prueba que se había tenido de estas, si el empleo de las primeras no hubiera sido ventajoso.

Las máquinas inglesas fueron fabricadas para el tráfico que tenía el ferrocarril de Chañarcillo anterior al año 1860; desde entonces este tráfico ha seguido disminuyendo disminuyendo considerablemente, como es bien sabido ; y estas máquinas en la época en que se vendió el ferrocarril eran demasiado poderosas y por consiguiente pesadas para que su empleo fuese económico en una línea cuyas gradientes alcanzan a un cinco por ciento y en donde es de importancia, remolcar el menor peso muerto posible. Sorprende por consiguiente, que las referidas máquinas se hayan puesto en una línea para la cual no eran ya aparentes, en lugar de algunas de las otras norteamericanas más livianas que poseía el ferrocarril de Copiapó. Este hecho demuestra lo ventajoso que eran las máquinas inglesas no obstante las cambiadas circunstancias del tráfico. El ferrocarril de Copiapó debe haber conocido la desventaja de explotar una línea como la de Chañarcillo con máquinas demasiado pesadas, porque encargó a los Estados Unidos otras más pequeñas, según los planos y especificaciones de su jefe de locomotoras, y a propósito para el servicio del ramal ; máquinas que principiaron a funcionar en 1872, en lugar de las inglesas que se colocaron en el servicio de la línea principal (véase el informe de 1872 pág. 11, cuadro No. 8). Posteriormente me ha escrito el jefe de Locomotoras del ferrocarril de Copiapó que a causa de la disminución creciente del tráfico de Chañarcillo las nuevas máquinas han llegado a ser a su turno demasiado poderosas para el tráfico. De todo esto se desprende que las máquinas inglesas en el ferrocarril de Chañarcillo, muy lejos de causar pérdidas enormes, como se pretende, debieron ser para el tráfico primitivo de ese ferrocarril, para el cual se fabricaron, muy superiores a las americanas, y que es muy natural que el ferrocarril de Chañarcillo dé buenos dividendos entre sus socios actuales, pero debido, no a las máquinas, sino a la circunstancia de haber éstos investido un capital tan pequeño en la adquisición de esa línea.

Tongoi. – Los informes semestrales de este ferrocarril no comprueban lo afirmado con respecto a esta línea en la nota del Señor Ministro. Dicha línea fué abierta al tráfico en junio de 1867 y fué explotada hasta Octubre del 1870 con equipo inglés. Entre esta última fecha y Abril

1870 page 13); but it is clear that the English engines would not have been put in place of the North American ones, after the test that had been had of these, if the use of the former had not been advantageous.

The English engines were made for the traffic that the Chañarcillo railway had before 1860; since then this traffic has continued to decline considerably, as is well known; and these engines at the time the railway was sold were too powerful and therefore too heavy for their use to be economical on a line whose gradients reached five percent and where it is important to haul the least possible weight. It is surprising, therefore, that the aforementioned engines were put on a line for which they were no longer suitable, instead of some of the other lighter North American ones that the Copiapó railway owned. This fact shows how advantageous English engines were despite the changed circumstances of the traffic. The Copiapó railway must have had the disadvantage of working a line like the Chañarcillo with overly heavy engines, because it ordered the United States to make smaller ones specifically for the branch service, according to the plans and specifications of its locomotive manager, engines that started operating in 1872, instead of the English ones that were placed in the service of the main line (see the 1872 report, page 11, table No. 8). Subsequently, the head of the Locomotives of the Copiapó railway wrote to me that due to the accelerating decrease in the traffic from Chañarcillo, the new engines have in their turn become too powerful for the traffic. From all this it follows that the English engines on the Chañarcillo railway, far from causing enormous losses, as it is claimed, must have been for the original traffic of that railway, for which they were manufactured, much superior to the American ones, and that it is quite natural that the Chañarcillo railway should pay good dividends to its current investors, not because of the engines, but because of the fact that they invested so little capital in the acquisition of this line.

Tongoi. – The six-monthly reports of this railway do not prove what has been said regarding this line in the north by the Minister. This line was opened to traffic in June 1867 and was operated until October 1870 with English equipment. Between this latter date and April 1871, new

de 1871 se puso en servicio el nuevo equipo norteamericano. Comprobando entonces la utilidad anual que dejó este ferrocarril durante los años de 1868 y 1870, en que se obtuvo posteriormente cuando se empleaba también el equipo americano, se conocerá si el o no exacto el hecho que se afirma en la nota de que me ocupó. El siguiente es el resultado.

1	2	3	4	5	6	7
1868	1.327,470					
1869	1.356,201	}\$547.740	\$291,731	\$85,336	6¼%	
						53¼%
1870	1.383,440					
1871	1.617,599					
1872	1.585,000	}\$332,376	\$179,499	\$76,438	4¾%	
						54%

- 1 = Año
- 2 = Capital
- 3 = Producto bruto
- 4 = Gastos
- 5 = ? medio de producto neto
- 6 = Interes [?] anual [?] capital [?] [?] [?]
- 7 = [?]

Resulta entonces que el ferrocarril de Tongoi durante los tres primeros años en que se empleó sino el equipo inglés, dió un interes anual sobre el capital invertido, de 6¼ por ciento, mientras que cuando el equipo era misto (inglés y americano) no dió sino 4¾%. Es evidente que si el producto neto de un ferrocarril fuese con argumento en pró o en contra de su equipo, el americano, por el resultado que dió en Tongoi, se debió considerar inferior al inglés. Los datos que he suministrado estan al alcance de todos ; pero aun sin consultar las memorias semestrales, es bien conocido que los accionistas de este ferrocarril, despues de emplear el equipo americano, no recibieron los buenos dividendos que la nota supone. Algunos de los tres miembros del Consejo Directivo pueden corroborar este asento, por que fueron, o sin todavia, accionistas de ese Empresa. Con el objeto de conocer con fijeza las ventajas comparativas entre las locomotoras inglesas y norteamericanas, conseguí que uno de los Directores del ferrocarril de Tongoi escribirse en ese sentido al Superintendente en Jefe de Locomotoras, de ese ferrocarril. La siguiente fué su respuesta :

“Tongoi, 30 de Agosto de 1873 – Le adjunto un estado del trabajo y gastos relativos de las locomotoras

North American equipment was put into service. Comparing then the annual profit that this railway achieved during the years 1868 and 1870, which was later obtained when the American equipment was also used, it will be known whether or not the fact is confirmed in the note that I am dealing with. The following is the result.

1	2	3	4	5	6	7
1868	1.327,470					
1869	1.356,201	}\$547.740	\$291,731	\$85,336	6¼%	
						53¼%
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- 7 = [?]

It turns out then that the Tongoi railway during the first three years in which only the English equipment was used, gave annual interest on the capital invested, of 6¼ percent, while when the equipment was mixed (English and American) it gave only 4¾ %. It is evident that if the net income of a railway were with arguments for or against its equipment, the American, due to the result it gave in Tongoi, should have been considered inferior to the English. The data I have provided is available to everyone; but even without consulting the semi-annual reports, it is well known that the shareholders of this railway, after using the American equipment, did not receive the high dividends that the note assumes. Some of the three members of the Board of Directors can corroborate this assertion, because they were, or were not yet, shareholders of that Company. In order to get a firm grasp of the comparative returns between the English and North American locomotives, I commented that one of the Directors of the Tongoi Railway wrote on that topic to the Superintendent in Chief of Locomotives of that railway. The following was his response:

“Tongoi, August 30, 1873 – I attach a statement of the work and relative expenses of the English and

inglesas y norte-americanas empleadas en esta línea; se verá que el resultado en cuanto a economía es en favor de las locomotoras inglesas, por mi parte dió decididamente la preferencia a los fabricantes inglesas, a causa de la mui superior obra de mano y materiales que estos emplean comparados con lo que se acostumbra en jeneral en Norte-América. Nuestras locomotoras americanas son causa de continua inquietud y gastos, debido a la mala calidad de la obra de mano de los calderos. Viajan indudablemente con mas facilidad sobre la línea por razon de la menor distancia entre sus ruedas; este defecto en las locomotoras inglesas es debido a que no se especificó al tiempo de encargar las locomotoras, el trabajo especial que tenian que hacer. En el caso que esta Compañía necesite mas locomotoras recomendaría enérgicamente que se adoptaren locomotoras inglesas.” Juan Langland.

Segun los estados acompañados a la carta anterior y a este informe, las locomotoras inglesas gastaron en carbon 22 centavos por quilómetro corrido, mientras que en las norte-americanas subió est gasto a 33 centavos. Las últimas son, sin embargo, de mayores dimensiones y fuerza que las primeras en la proporcion de 13 a 10, así que, calculando el consumo de carbon en proporcion a la fuerza de la máquina, cálculo que es favorable a las norte-americanas, resultaría una proporcion de gasto de combustible de 22 a 25, o la inglesa gastaría un 12% ménos de combustible, cuando ambas máquinas desfilégaran la misma fuerza.

En cuanto al primer costo, las inglesas importaron cada una \$9.500, y las americanas \$15,229. El peso de las americanas comparado con el de 20 a 17, así que una máquina inglesa de la misma fuerza que la americana habría importado \$11,176, o 26% ménos que la americana.

En cuanto a su material y otra de mano, hemos visto por la carta del Super-intendente de ese ferrocarril que el de las máquinas americanas es mui inferior al de las inglesas. Las americanas en el ferrocarril de Tongoi son, por consiguiente, en iguales circunstancias con las inglesas, mas costosas, ménos económicas de combustible, exigen mas reparacionas, y a causa de se inferior calidad son ménos durables de las primeras. En uno de los ramales del ferrocarril de Tongoi, el de Talaya, las locomotoras americanas suben un peso algo mayor que las inglesas en proporción de un 2% si se toma en cuenta, como se debe, las diferentes dimensiones de ambos tipos. Las americanas tienen cilindros de 13

North American locomotives employed in this line; it will be seen that the result in terms of economy is in favour of the English locomotives, for my part it gave preference decisively to the English manufacturers, because of the much superior workmanship and materials that they use compared to what is customary in general in North America. Our American locomotives are a cause of continuing concern and expense due to the poor quality of the boiler work. They undoubtedly travel more easily on the line due to the shorter distance between their wheels; This defect in English locomotives is due to the fact that the special work that they had to do was not specified at the time of ordering the locomotives. In the event that this Company needs more locomotives, I would strongly recommend that English locomotives be adopted.” Juan Langland.

According to the summary accompanying the previous letter and this report, English locomotives cost 22 cents per kilometre run on coal, while for the North American engines this expense increased to 33 cents. The latter are, however, larger and stronger than the first in the proportion of 13 to 10, so, calculating the consumption of coal in proportion to the output of the engine, a calculation that is favourable to the North American ones, would result in a proportion of fuel expenditure of 22 to 25, or the English would spend 12% less fuel, when both engines exercise the same output.

As for the initial cost, the English were imported for \$ 9,500 each, and the American \$ 15,229. The weight of the American engine compared to that of an English one is 20 to 17, so an English engine of the same strength as the American would have cost imported \$ 11,176, or 26% less than the American.

As for its materials and other workmanship, we have seen from the letter from the Superintendent of that railway that that of the American engines is much poorer than that of the English ones. The American ones on the Tongoi railway are, therefore, in the same circumstances as the English ones, more expensive, less fuel-efficient, require more repairs, and because of their inferior quality are less durable than the former.

In one of the branches of the Tongoi railway, that of Tamaya, the American locomotives will haul a somewhat higher load than the English ones in proportion of 2% if the different dimensions of both types are taken into account, as they should be. The Americans have 13-inch

pulgadas de diámetro, 18 pulgadas de golpe, y una presión de vapor de 140 libras sobre una pulgada cuadrada, y pesan 20 toneladas. Las inglesas en iguales piezas tienen 12, 17, 130 y 17 toneladas respectivamente. Las dimensiones de las ruedas motrices son iguales en ambas. Con estos datos se verá que la fuerza de las primeras comparada con las últimas, es de 13 a 10. Las primeras ascienden por el ramal de Tamaya, según su Superintendente en Jefe de Locomotoras, 65 toneladas incluso su propio peso, mientras que las últimas arrastran 49 toneladas bajo las mismas circunstancias, (véase el estado que adjunto) debiendo para igualar a las primeras arrastrar 50. Esta diferencia debería sin embargo, ser mucho mayor porque las máquinas inglesas no son aparentes para el servicio de este ramal que tiene curvas excepcionalmente cerradas de 57 metros de radio, para las cuales no fué fabricada dicha máquina ; y de donde resulta que gran parte de su fuerza se gasta en vencer la resistencia que le presentan las curvas aludidas. La americana por el contrario, fué diseñada por el antiguo Jefe de la Maestranza del ferrocarril de Copiapó especialmente para el ramal de Tamaya, y fué fabricada en uno de los principales talleres de Estados Unidos. Que esta máquina no dé un mejor resultado que el queda, de muestra la inferioridad de las máquinas americanas comparadas con las isas aun en las circunstancias altamente favorables a las primeras. Le adjunto los estados originales del consumo de las máquinas de Tongoi, su peso, dimensiones, carga que arrastran, costo, etc. suministrados por el Superintendente de esa línea.

Resumiendo lo dicho anteriormente la resulta : – que lo que verdaderamente ha pasado en los ferrocarriles del “Grand Trunk”, Chañarcillo y Tongoi, en cuanto a equipo, da un resultado diametralmente opuesto a lo afirmado en la nota del Señor Ministro sobre las ventajas como operativas del equipo inglés y americano. Los ejemplos suministrados en dicha nota, no pueden en consecuencia aducirse en apoyo del abandono de las diez locomotoras primitivas que poseemos de uno de los tipos ingleses, las que si no son tan aparentes para esta línea como las del adoptado anteriormente, prestan sin embargo, servicios importantes en los trenes lijeros que requiere la explotación variada de este ferrocarril y en una economía en sus gastos de tracción y compostera, superior al de las máquinas americanas que trabajan en el país.

Mucho ménos convendría la adopción de máquinas

diameter cylinders, 18-inch stroke, and a steam pressure of 140 pounds per square inch, and weigh 20 tons. The English data are 12, 17, 130 and 17 tons respectively.

Driving wheel diameters are the same on both. With this data it will be seen that the power of the former, compared to the latter, is 13 to 10. The former climb the Tamaya branch, according to its Chief Superintendent of Locomotives, with 65 tons including their own weight, while the latter haul 49 tons under the same circumstances, (see the attached summary) having to equal the first ones haul 50. This difference should, however, be much greater because the English engines are not suitable for the service of this branch that has exceptionally tight curves of 57 metre radius, for which that engine was not manufactured; And where does it come from that much of its power is spent on overcome the resistance caused by the aforementioned curves. The American, on the other hand, was designed by the former Chief of the Maestranza of the Copiapó railway, especially for the Tamaya branch, and was manufactured in one of the main workshops of United States. That this engine does not give a better result than the rest, shows the inferiority of the American engines compared to the English ones even in circumstances highly favourable to the former.

I attach the original statistics of the Tongoi engines, their weight, dimensions, tractive effort, cost, etc. supplied by the Superintendent of that line.

Summarizing the above, it is found: – that what has really happened on the “Grand Trunk”, Chañarcillo and Tongoi railways, in terms of equipment, gives a result that is diametrically opposed to what was stated in the note from the Minister on the operational advantages of the English and American engines. The examples provided in that note, therefore, cannot be adduced in support of the abandonment of the ten early locomotives that we have of one of the English types, which, if not as effective for this line as those of the one previously adopted, provide, however, important services, on the light trains that are needed during the varied operation of this railway and in an economy in its expenses of traction and train make-up, superior to that of the American engines that work in the country.

Much less would be the adoption of American engines, of

americanas, de cualquier clase que sean, en preferencia al tipo especial adoptado por esta Empresa.

No estará, probablemente, de mas que advienta, que el tipo de las máquinas inglesas que posee esta línea es distinto al de las inglesas que poseen el "Grand Trunk", Chañarcillo y Tongoi. No son tampoco aquellas del antigua sistema ingles que insinua la nota del Señor Ministro, a cuyo sistema, por el contrario, se asemeja mucho la locomotora americana en sus piezas esenciales.

Por ejemplo : – el armazon que sostiene todo el mecanismo es el mui imperfecto de barras de fierro, tal como lo tenían las antiguas locomotoras inglesas de 1830, varias de las cuales fueron remitidas a los Estados Unidos y allí copiadas. Posteriormente se mejoró notablemente esta fuerza forjándola en forma de plancha, mejora que se ha jeneralizado en toda la Europa, pero que todavía no se ha aplicado en los Estados Unidos a la máquina americana. Casi todas las locomotoras americanas se fabrican con sus cilindros colocados esteriores, como lo era primitivamente la máquina inglesa y lo es todavía armado? en la misma nacion, aunque esta situacion es anti-economica de combustible y no tiene mas ventaja que abaratar la máquina. Las ruedas de las locomotoras americanas son en jeneral de fierro colado, aunque hace muchos años la inglesa no emplea sino las mui superiores de fierro balido. En fin : la primera emplea fierro colado en muchas de las piezas en que la última usa el fierro batido o bronce; y la americana usa el fierro batido en casos en que la inglesa para la mayor duracion de la máquina se sirve del bronce o cobre. En resúmen: en la locomotora americana se sacrificar la fuerza, economía y duracion de la máquina, al objeto de disminuir su primer costo, porque de otra manera no podría competir, aun dentro de su propio territorio, con las fabricadas en Europa, a donde los materiales y obra de mano son de menor costo que en los Estados Unidos. En prueba de que lo que antecedentes exajerado, cito enseguida testualmente varios párrafos del ingeniero norte-americano Colburn. Este dice en su memoria sobre el equipo americano, páginas 1a a 15:

"Los ferrocarriles norte-americanos demuestran en su construccion y explotacion poco mas que la aplicacion modificada de la práctica inglesa. Cuando los sistemas de material movible de ambos paises se comparan, se encuentra que las diferencias que primeramente llaman la atencion son mas bien superficiales que fundamentales

any class they are, in preference to the special type adopted by this Company.

It will probably not be unexpected, that the type of English engines that this line owns is different from the English ones that the "Grand Trunk", Chañarcillo and Tongoi railways run. They are not those of the old English system that the note of the Minister insinuates, to whose system, on the contrary, the American locomotive is very similar in its essential parts.

For example: – The frame that supports the whole mechanism is of very imperfect iron bars, just like the old English locomotives of 1830 had, several of which were sent to the United States and copied there. Later this strength was notably improved by forging it in the form of a plate, an improvement that has become general throughout Europe, but has not yet been applied to the American engine in the United States. Almost all American locomotives are manufactured with their cylinders placed externally, as the English engine was originally and still built in the same nation, although this situation is anti-economical in fuel and has no more advantage other than making the engine cheaper. The wheels of the American locomotives are in general of cast iron, although many years ago the English replaced them with superior ones of wrought iron. Finally, the former uses cast iron in many of the pieces in which the latter uses wrought iron or bronze; and the American uses wrought iron in cases where the English uses bronze or copper for the longer life of the engine. In short, in the American locomotive the strength, economy and length of life of the engine is sacrificed, in order to reduce its first cost, because otherwise it could not compete, even within its own territory, with those manufactured in Europe, where materials and labour are of lower cost than in the U.S. In proof that what I have outlined, I immediately quote several paragraphs from the North American engineer Colburn. It says in his report about American equipment, pages 1 to 15:

"The North American railways demonstrate in their construction and operation little more than the modified application of English practice. When the rolling stock systems of both countries are compared, it is found that the differences to which it first calls attention is rather superficial than fundamental and also that many of the

y tambien que mucha de las peculiaridades de construccion todavía conservadas en norte-america son debidas a la iniciativa de ingenieros ingleses. Si no fuera por las necesidades de un pais nuevo y la escasez comparativa de capitales, los ferrocarriles norte-americanos y sus equipo hubieron sido indudablemente construidos como en otros paises, segun modelos ingleses, y explotados principalmente segun los principios ingleses de administracion.”

“El avantren jiratorio es la principal pieza característica de las locomotoras y equipo norte-americano ; fuera de este, las diferencias entre las locomotoras inglesas y norte-americanas sin mas bien superficiales que de principios importantes de construccion.”

“El trabajo de calderería de las locomotoras norte-americanas es inferior con respecto a resistencia y perfeccion al de las locomotoras inglesas, y en cuanto a explosiones de locomotoras, son ciertamente mucho mas numerosas en Estados Unidos que en Inglaterra, aun tomando en cuenta que en el primer pais hai 15 mil y en el último 10 mil máquinas.”

“El costo de casi todos los materiales y la obra de mano que se emplea en la reparacion de las locomotoras, excepto la madera, es mucho mayor que en la Gran Bretaña.”

Esto es lo que dice un ingeniero norte-americano cuya especialidad era el ramo de locomotoras y que en razon de su competencia, fué comisionado por varias líneas norte-americanas para que visitara la Europa y les informase sobre las mejoras que se habian introducido en sus ferrocarriles.

Es un error, por consiguiente, suponer que los norte-americanos han inventado la locomotora que poseen, siendo que la fabricada en Estados Unidos no es sino una copia de la inglesa, modificada para las líneas mas imperfectas de aquel pais y por el empleo de materiales de inferior clase, pero sin muchas de las mejoras que ha recibido inglesa con el trascurso de los años. Tambien se juzgará de la imposibilidad que en Inglaterra se adopte un tipo de máquina norte-americana que, como he manifestado, es el propio antigua de ella modificado para una clase de líneas que no existe en Inglaterra.

En órden a la capital cuestion de locomotoras, creo haber demostrado en suficientes detalles lo perjudicial que ha dado tan excelentes resultados en este ferrocarril, sin tener la seguridad que el que se propone sustituir es superior al adoptado, en los requisitos necesarios de fuerza, economía y duracion ; requisitos que hasta ahora

peculiarities of construction still used in North America are due to the initiative of English engineers. If it weren't for the needs of a new country and comparative scarcity of capital, railways North Americans and their equipment had undoubtedly been built as in other countries, according to English models, and operated mainly according to English principles of administration.”

“The turning front truck is the main characteristic piece of North American locomotives and equipment; apart from this, the differences between the English and North American locomotives are more superficial than important construction principles.

“The boiler work of the North American locomotives is inferior with respect to strength and assembly to that of the English locomotives, and as for locomotive explosions, they are certainly much more numerous in the United States than in England, even taking into account that the first country has 15,000 and the latter 10,000 engines.”

“The cost of almost all the materials and the labour that is used in the repair of the locomotives, except wood, is much higher than in Great Britain.”

This is what a North American engineer says whose speciality was in locomotives and because of his competence, he was commissioned by several North American lines to visit Europe and inform them of the improvements that had been made to their railways.

It is a mistake, therefore, to suppose that the North Americans have invented the locomotive they possess, since one manufactured in the United States is but a copy of the English one, modified for the most imperfect lines in that country and the use of lower quality materials, but without many of the improvements that English has received over the years. It will also be judged from the impossibility that in England a type of North American engine should be adopted, which, as I have stated, is its own type, modified for a class of lines that does not exist in England.

In respect of the capital question of locomotives, I think I have demonstrated in sufficient detail how damaging such excellent results which have been given in this railway, without having the certainty that the one that which is intended to replace it is superior to that adopted, in the necessary requirements of tractive effort, economy and

posee, como suyo de esos mismos detalles, en mui inferior grado, la locomotora americana segun sus propios fabricantes.

Coches de Pasajeros

El sistema americano de coches para tientes de pasajeros ha sido ensayado en Austria, Wurtemberg, Bavaria y Suiza y posteriormente abandonado como inferior al sistema ingles, esceptuando el ferrocarril Nor-este de Suiza, en el que se ensaya un tipo denominado misto, pero que no tiene mas de americano que el pasadizo interior.

Las razones principales que se tienen para preferir el tipo ingles al americano son las siguientes : –

1^o.- Menor peso absoluto del carro.

2^o.- Menor peso por cada pasajero que puede contener el carro, cuando los de ambos tipos son de igual material y solidez.

3^o.- Mayor facilidad para entrar y salir del tren.

4^o.- Mayor velocidad que admite sin peligro un tren de coches ingleses.

5^o.- Amoldarse mejor a las variaciones del tráfico.

6^o.- Mayor facilidad en colocar en la via un coche que se han salido de ella.

Por otra parte, el coche americano tiene la ventaja de correr con mas seguridad sobre una línea desnivelada. Segun autores europeos, esta circunstancia ha obligado su empleo en los Estados Unidos, no obstante sus numerosas desventajas. Uno de estos autores mas distinguidas, el ingeniero frances Couche, que actualmente publica una obra mui completa sobre el material movible de los ferrocarriles, se espresa de esta manera : (páj. 24) “Los coches sobre aparatos jiratorios pueden correr con pequeña velocidad sobre vias de débil construccion, medianamente mantenidas y con imperfecto nivel. Las alineaciones y el estado de las vias seran suficiente por sí solas para obligar una combinacion de esta clase : estos aparatos jiratorios pueden inclinarse o amoldarse por sus cuatro o seis puntos de apuyo sobre las desigualdades de la vía y repartir de esa manera el peso entre ellos, sin que la caja del coche siga en sus movimientos.

“Esta independiencia de los aparatos jiratorios concuerda mui eficazmente, bajo este punto de vista, con la accion de los resortes de suspension; pero este sistema es inadmisibile a gran velocidad, aun sobre vias escelentes, etc.

Paso a detallar las desventajas de los coches americanos

durability; requirements which till now you have to a much lesser degree, the American locomotive according to its own manufacturers.

Passenger Coaches

The American system of passenger coaches has been tested in Austria, Wurtemberg, Bavaria and Switzerland and later abandoned as inferior to the English system, excepting the Northeast railway in Switzerland, in which a type called composite is being tested, but which has nothing American other than the gangway inside.

The main reasons for preferring the English to the American type are the following: –

1st – Lower absolute weight of the coach.

2nd – Less weight per passenger that the coach can carry, when those of both types are of the same materials and solidity.

3rd – Greater ease to enter and exit the train.

4th – Higher safe speed possible with a train of English coaches.

5th – Easier to adapt to traffic variations.

6th – Greater ease in re-railing a coach that has left the track.

On the other hand, the American coach has the advantage of running more safely on an uneven line. According to European authors, this circumstance has forced their employment in the United States, despite its numerous disadvantages. One of these most distinguished authors, the French engineer Couche, who currently publishes a very complete work on the rolling stock of the railways, expresses himself in this way: (p. 24) “coaches on rotating devices can run with slow speed on tracks of weak construction, moderately maintained and with an imperfect level. The alignment and the state of the track would be sufficient enough on their own to force a combination of this kind: these swivel devices can be tilted or shaped by their four or six points of support on the inequalities of the line and thus distribute the weight among them, without the coach body following in their movements.

“This independence of the giratory devices agrees very effectively, from this point of view, with the action of the suspension springs; but this system is unacceptable at high speed, even on excellent lines, etc.

Moving on to to list the disadvantages of American

de pasajeros :

1^o.- Su mayor peso absoluto – En los Estados Unidos, como regla jeneral, no existe sino una clase de pasajeros, y cada coche pesa de 18 a 30 toneladas vacío, para una vía más estrecha que la del ferrocarril del Norte (Consulten la obra norte-americana de Vose sobre los ferrocarriles de ese país, 1873 pág. 411).

Los coches ingleses para una vía igual pesan ordinariamente seis toneladas.

El servicio económico de la línea del Norte, a donde el número de viajeros disminuye a medida que las estaciones se alejan de Valparaíso, exige que se viajen dejando carros en Viña del Mar, Quillota y Llaillai. Esto se hace fácilmente en la actualidad con los carros ingleses, pero no sería posible hacer estas maniobras con los americanos de triple o quintuple peso, sin aumentar considerablemente el personal y por consiguiente los gastos de la estaciones o el de arrastrar por todas las fuertes subidas de la línea con peso inútil que obligaría a disminuir la dotación de coches de los trenes.

La dificultad de trasladar los americanos de un punto a otro, a causa de su gran peso, en los numerosos casos en que no es posible no conveniente emplear la locomotora, es demasiado evidente y me evita que me extienda más sobre este punto.

2^o.- Menor peso por pasajero de los coches ingleses comparado con los americanos.

Según el autor norte-americano Colburn, en su obra sobre el equipo de su nación, los coches americanos no aprovechan en sus asientos sino la mitad de su piso, mientras que los ingleses ocupan las dos terceras partes. Esto es, en dos coches de igual largo y ancho y de ambos tipos, habrá asientos para una tercera parte más de pasajeros en el inglés que en el americano. Este hecho es debido al espacio inutilizado con el pasadizo central característico del equipo americano. – Es claro entonces que en igualdad de condiciones el peso del coche por pasajero, tiene que ser mayor en el americano que en el inglés.

Hai, sin embargo, otra circunstancias que aumenta todavía más el peso de aquel coche, y es la gran distancia que hai entre los puntos que sostiene la caja y que es de cuatro a seis veces mayor que en los ingleses, lo que le obliga a hacer una enmaderación de mayor dimensiones y por consiguiente más pesada que en el otro tipo. El carro americano tiene por consiguiente que son más pesado por pasajero que el inglés cuando ambos tienen igual solidas e igual comodidad. Mui bien dificultad

passenger coaches:

1st – Their great absolute weight – In the United States, as a general rule, there is only one class of passengers, and each coach weighs 18 to 30 tons empty, for a narrower gauge than that of the Northern railway (Consult Vose's North American work on the railways of that country, 1873 p. 411).

English coaches for the same gauge ordinarily weigh six tons.

The economic service of the North line, where the number of travellers decreases as the stations move away from Valparaíso, demands that it travels leaving coaches in Viña del Mar, Quillota and Llaillai. This is easily done nowadays with the English coaches, but it would not be possible to shunt the American ones of three or five times the weight, without considerably increasing the personnel and consequently the expenses of the stations or surmounting all the steep climbs of the line with useless weight that would force a decrease in the number of coaches on the trains.

The difficulty of moving the American coaches from one point to another, due to their great weight, in the numerous cases in which it is not possible not to use the locomotive, is all too evident and prevents me from dwelling further on this point.

2nd – Lower weight per passenger of English coaches compared to American ones.

According to the North American author Colburn, in his work on the equipment of his nation, American coaches do not use more than half of their floor-space in their seats, while the English occupy two thirds. That is, in two coaches of equal length and width and of both types, there will be seats for a third more passengers in English than in American. This fact is due to the unused space with the central passageway characteristic of the American vehicles. It is clear then that in equal conditions the weight of the coach per passenger, has to be greater in the American than in the English.

Nevertheless other circumstances that increase even more the weight of that coach, is the great distance that there is between the points at which the body is supported and which is four to six times greater than in the English, which requires framing of greater dimensions and therefore heavier than the other type. The American coach is therefore heavier per passenger than the English when both have equal strength and equal comfort. Very great difficulty in building coaches of the first type

hacerse carros del primer tipo comparativamente mas livianos : estrechando los pasajeros en un espacio reducido e incomodo ; debilitando las maderas y empleando pino en lugar de roble ingles y teka ; no aplicándoles sino fierros débiles los que no violenten la enmaderacion y que no servirian para líneas accidentadas como la del Norte, y en fin, desentendiéndose que en un choque de trenes los de esta última clase se destruirían. No sería justo comparar estos carros con los fabricados de las mejores y fuertes maderas y con amplia comodidad para el viajero.

Comparando los coches americanos tal como se construyen en los Estados Unidos, con los ingleses en uso en Europa, se conocerá la gran ventaja de estos en cuanto a peso comparativo. Como ejemplo de los ingleses someteré los de la línea francesa de Ostiano, por encontrarse en la obra acreditada y muy conocida aqui, de Goschler (Chemins de Fer, tomo 3^o., páj^a. 305) aunque estos son algo mas pesado que los en uso en Inglaterra. Los de 1^a. clase pesan 6,050 quilógramos y contengan 24 pasajeros o 252 quilógramos por pasajero. Los de 2^a. clase pesan 5440 quilógramos y contengan 40 asientos o 136 quilógramos por asiento. Los de 3^a. clase pesan 5,460 quilógramos con asientos para 50 pasajeros o 109 quilógramos por pasajero.

El término medio es de 149 quilógramos por cada pasajero que pueden contener los coches.

Los americanos ordinarios pesan segun el autor norteamericano Vose (Manual de ferrocarriles – 1873 página 411) 279 quilógramos por pasajero o un 10% mas que los de 1^a clase ingleses. Sería mas justo sin embargo comparar el coche americano que sirve para todas las clases de la sociedad en los Estados Unidos con el término medio del equipo europeo que es de 149 quilógramos por unidad, o lo que es lo mismo el americano pesa 87% mas que el ingles por cada pasajero que contiene.

Los de 1^a clase europeo, aunque comparativamente mas livianos que los americanos, no deben sin embargo compararse con éstos que no ofrecen la comodidad de aquellos, sino mas bien con los americanos llamados de Pullman.

Estos pesan hasta 500 quilógramos por pasajero o el doble de los coches ingleses.

En la línea de Valparaiso a Santiago es de suma importancia, a causa de lo accidentado del camino, que el peso muerto sea el menor posible y que tengan al mismo tiempo mucha solidez para que así resista la

comparatively more lightly: squeezing passengers in a small and uncomfortable area; weakening the woods and using pine instead of English oak and teak; applying only weak iron. It must those which do not distort the framing and which would not serve for rugged lines like the North, and finally, ignoring that in a train crash those of the latter class would be destroyed. It would not be fair to compare these coaches with those made of the best and strongest woods and with ample comfort for the traveler.

Comparing the American coaches as they are built in the United States, with the English ones in use in Europe, the great advantage of these in terms of comparative weight will be known. As an example of the English I will submit those of the French line of Ostiano, found in the credited and very well-known work here, of Goschler (Chemins de Fer, volume 3, p. 305) although these are somewhat heavier than those in use in England. Those of 1st class weigh 6,050 kilograms and carry 24 passengers or 252 kilograms per passenger. Those of 2nd class weigh 5,440 kilograms and carry 40 seats or 136 kilograms per seat. Those of 3rd class weigh 5,460 kilograms with seats for 50 passengers or 109 kilograms per passenger.

The average is 149 kilograms for each passenger who occupies the coaches.

Ordinary American coaches weigh according to the North American author Vose (Railroads Manual – 1873 page 411) 279 kilograms per passenger or 10% more than those of English 1st class. It would be fairer, however, to compare the American coach that serves all classes of society in the United States with the average of the European equipment that is 149 kilograms per unit, or what is the same, the American weighs 87% more than the English for each passenger it contains.

Those of European 1st class, although comparatively lighter than the Americans, should not however be compared with those which do not offer the comfort of those, but rather with the American coaches called Pullman.

These weigh up to 500 kilograms per passenger or twice that of English coaches.

On the line from Valparaiso to Santiago it is of utmost importance, due to the ruggedness of the road, that the dead weight is as low as possible and that they are at the same time very solid so that it thus resists the action of

accion de los poderosos frenos con que deben proveerse. El equipo ingles, como hemos visto, cumple mas satisfactoriamente con estas condiciones que el americano.

3º.– Menor facilidad para entrar y salir de un tren de coches americanos que de otro de equipo ingles.

Los coches americanos con doble número de pasajeros de los que entiene uno ingles, tienen solamente la mitad de las puertas, y ademas cada pasajero recorre, término medio, una distancia desde su asiento a la puerta diez veces mayor que en los del tipo ingles.

Resulta entónces que con estos coches hai que aumentar el tiempo que los trenes demurran en las estaciones.

4º.– Mayor velocidad que admiten sin peligro los coches ingleses.

Ya he citado sobre este punto la opinion de Mr. Couche, que no es mas que un resúmen de la opinion de los ingenieros, europeos sobre este defecto de material americano.

5º.– Los coches americanos no se prestan a una explotacion complicada cada con tanta facilidad como los ingleses.

Un tren que tuviera suficiente dotacion para el servicio a que se destina con un coche de cada clase del equipo ingles, si para este trabajo se le colocan coches americanos, se tendria en este caso que arrastrar cuatro veces mayor peso que en el primero. Aplicándolos al tren nocturno misto de la línea del Norte habría necesariamente que disminuir notablemente el número de sus carros de carga. En los trenes espresos de ramal de Los Andes y los especiales que corren para unos pocos pasajeros, la desproporcion entre el peso muerto y el útil sería enorme.

En los Estados Unidos donde no hai coches sino de una sola clase, estos inconvenientes sin por supuesto, de secundaria importancia.

6º.– Dificultad para colocar en la via un coche que se ha salido de ella.

Esta consiste no solamente en el mayor peso que hai que levantar, sino tambien en que las ruedas jiratorias una vez fuera de los rieles se atraviezan a la línea e impulsan los carros a mucha mayor distancia de los rieles que las ruedas ordinarias. Por esta misma razon es mucho mas dificil volver a colocar el coche en la vía, aunque se encuentre mui cerca de ella, y en el ferrocarril del Norte, sobre todo en el Tabón sería fatal un desrielamiento que hiciera correr los coches a gran distancia fuera de los rieles.

the powerful brakes with which they must be provided.

The English stock, as we have seen, meets these conditions more satisfactorily than the American equipment.

3rd – Less ease for getting in and out of a train of American coaches than another of the English equipment.

The American coaches with double the number of passengers of an English one, have only half the number of doors, and also each passenger travels, on average, a distance from their seat to the door ten times greater than in those of the English type.

It turns out then that with these coaches it is necessary to increase the time that the trains stop at the stations.

4th – Higher speed which English coaches allow without danger.

I have already quoted on this point the opinion of Mr. Couche, which is nothing more than a summary of the opinion of the European engineers on this defect in American material.

5th – American coaches do not each lend themselves to complicated operation as easily as the English.

A train that had sufficient capacity for the service that it provides with a coach of each class of English equipment, if for this work American coaches are used, it would have to haul in this case four times more than with the former. Applying them to the mixed night train of the North line would necessarily have to significantly reduce the number of their goods wagons. The Los Andes branch express trains and specials that run for a few passengers, the disproportion between the deadweight and the useful would be enormous.

In the United States where there are only coaches of the one class, these drawbacks are of course of secondary importance.

6th – Difficulty replacing a coach that has left the line. This consists not only in the heavier weight to be lifted, but also that the swivelling wheels, once off the rails, traverse the line and propel the coaches much farther from the rails than ordinary wheels. For this same reason it is much more difficult to put the coach back on the line, even if it is very close to it, and on the railway del Norte, especially in the Tabón, a derailment that would make the cars run a great distance off the rails would be fatal.

En el único punto en que el coche americano aventajaría al inglés aplicado a esta línea, es en la mayor facilidad con el conductor del tren recojería los boletos de los pasajeros y en la comodidad de estos de poderse mover de un coche a otro. Apenas necesito observar que esta ventaja es de mui secundaria importancia a los numerosos inconvenientes con que está gravado el equipo americano y que ha causado ser rechazado despues de largos años de ensayos en varios países de Europa donde ha sido probado.

Carros de Carga.

Los carros de carga americanos tienen el inconveniente, como los de pasajeros del mismo tipo, de ser mas pesados por sí y por unidad de peso que cargan, que los del tipo inglés.

En una línea comun, los carros de plataforma ingleses bien proporcionados, pueden conducir el doble de su propio peso, mientras que los americanos, en iguales circunstancias, solamente media vez mas. Iguales proporciones comparativos rijen en los de cajon de ambos tipos y en cuanto a los de bodega ingleses, cargan una y media vez su peso, mientras que los americanos solamente lo que pesan o algo mas. Estas proporciones son las que se aplican a ambos tipos en un ferrocarril comun medianamente accidentado ; pero fácilmente se comprenderá que dichas proporciones varían mucho de una línea a otra segun las dificultades de su trazado y la velocidad de sus trenes de carga. Se puede, sin embargo, tomar como regla jeneral que en una misma línea por igual peso de carro, el inglés carga un tercio mas que el americano.

Los carros de plataforma americanos que posee el ferrocarril del norte, pesan diez toneladas y no conducen sino el mismo peso. Los de cajon ingleses del modelo mas pesado que posee el ferrocarril y con frenos de tornillo se fabricaron para conducir 10 mil quilógramos y pesan 5,400, esto es, llevan la misma carga que los americanos de plataforma y pesan mucho ménos. Los de bodega, lo mismo que los de cajon, tienen mayor peso muerto que el acostumbrado en líneas europeas ordinarias a causa de las dificultades excepcionales que presenta a la explotacion el ferrocarril del Norte.

No estará demas que advierta que a causa de la escasez de equipo en la línea del Norte, se coloca mui a menudo sobre sus carros un peso superior al que pueden resistir con seguridad; y para evitar el abuso, la administracion se ha visto en la necesidad de borrar el peso que el

The only point in which the American coach would surpass the English on this line, is in the easier manner for the train guard to collect passenger tickets and in the convenience of being able to move from one car to another. It is just necessary to note that this advantage is of secondary importance compared with the many disadvantages with which the American equipment is subject and that it has caused rejection after long years of testing in various countries in Europe where it has been tried.

Goods Wagons

American freight wagons have the drawback, like passenger coaches of the same type, of being heavier on their own and per unit of weight they carry, than those of the English type.

In a common line, well-proportioned English platform wagons can carry twice their own weight, while American ones, in the same circumstances, only half as much more. The same comparative proportions apply to high-sided ones of both types, and as for the English vans, they carry one and a half times their own weight, while the Americans only what they weigh or a little more. These proportions are those that apply to both types in a moderately rugged road; but it will be easily understood that these proportions vary greatly from one line to another according to the difficulties of its route and the speed of its freight trains. It can, however, be taken as a general rule that in the same line for the same wagon weight, the Englishman carries a third more than the American.

The American flat wagons that the northern railway owns weigh ten tons and only carry the same weight. The English high-sided wagons of the heaviest model that the railway owns and with screw brakes were manufactured to carry 10 thousand kilograms and weigh 5,400, that is, they carry the same load as the American flat wagons and weigh much less. The box vans, as well as the high-sided ones, have a greater dead weight than the ones customary on ordinary European lines due to the exceptional difficulties that the Northern railway presents for operations.

It will not be too much to notice that due to the shortage of equipment on the North line, a load is often placed on their wagons higher than they can safely carry; And to avoid abuse, the management has needed to delete the weight that the manufacturer had marked on the wagons,

fabricante había marcado sobre los carros demostrando el que según ella podía soportar con seguridad, y lo ha sustituido por un número menos.

Por ejemplo : en los carros que se han fabricado para transportar 10 toneladas se han marcado 8, etc. Los números sobre los carros no indican, por consiguiente, el peso verdadero que pueden resistir sin riesgo, sino uno menos.

Por carro americano me refiero al de ocho ruedas en dos grupos de cuatro, por ser este el más usado en los Estados Unidos, y por inglés el de cuatro ruedas, aunque ambos fueron introducidos de Inglaterra a aquel país. Los primeros, sin embargo, han sido casi totalmente abandonados en Inglaterra hace más de cuarenta años. En los Estados Unidos, al contrario, las dos terceras partes son de ocho ruedas y el resto de 4.

El peso de los carros que se emplearon en los Estados Unidos es el siguiente:—según el manual del autor norteamericano Voze, 1873, pág. 412, y se refiere a la vía ordinaria de los Estados Unidos que es más estrecha que las del Gobierno en Chile.

	Peso	Carga	***
Carros de cajón de 8 ruedas	6,132	10,304	1.66 i 1
Carros de cajón de 4 ruedas	3,091	6,182	2.00 i 1
Carros de bodega de 8 ruedas	8,188	9,200	1.12 i 1

*** = Proporción entre la carga y el peso del carro

En los carros fabricados en Estados Unidos para sus propias líneas el carro de 8 ruedas es, según se notará de mayor peso comparativo que el de 4 ruedas.

La proporción entre el peso muerto y útil es mucho mayor en la práctica en contra del sistema americano, de lo indicado arriba; porque los carros no conducen en término medio ni la mitad del mayor peso que puede recibir su plataforma.

El mayor peso absoluto y relativo no es el único inconveniente del equipo americano ; con este material no pueden emplearse con ventaja mesas giratorias, cuyo uso es de gran utilidad en las estaciones de mucho tráfico cuando su espacio es reducido. El sistema de enganche de los carros ingleses, comparado con el americano facilita sobremano la armadura de trenes, ventaja importantísima en una estación como la de Valparaíso en donde el número de artículos y sus destinos es tan variado.

Las desventajas de los carros americanos de carga, comparados con los ingleses, son tan evidentes que en los

displaying what it was thought it could safely support, and has replaced it with a lesser number.

For example: on wagons that have been manufactured to transport 10 tons, 8 has been marked, etc. The numbers on the wagons therefore do not indicate the true weight they can safely carry, but a lesser one.

By American wagon I mean the eight-wheel wagon in two groups of four, as this is the most used in the United States, and by English that of four wheels, although both were introduced from England to that country. The former, however, have been almost entirely abandoned in England more than forty years ago. In the United States, by contrast, two thirds are eight wheels and the rest 4.

The weight of the wagons used in the United States is as follows:—according to the manual of the North American author Voze, 1873, p. 412, and refers to the ordinary gauge of the United States that is narrower than that of the Government in Chile.

	Tare	Load	***
8 wheeled open wagons	6,132	10,304	1.66 to 1
4 wheeled open wagons	3,091	6,182	2.00 to 1
8 wheeled vans	8,188	9,200	1.12 to 1

*** = Ratio between the load and the tare weight

In wagons made in the United States for their own lines, the 8-wheel wagon is, as will be noted, of greater comparative weight than the 4-wheel wagon.

The ratio between dead weight and useful weight is much greater in practice against the American system, than indicated above; because the wagons do not carry on average half of the greatest weight that could be accommodated on the platform.

The greater absolute and relative weight is not the only drawback of the American wagons; With this material, turntables cannot be used to advantage, the use of which is very useful in busy stations where space is limited. The coupling system of English wagons, compared to the American one, greatly facilitates the making up of trains, a very important advantage in a station like the one in Valparaíso where the number of articles and their destinations is so varied.

The disadvantages of American freight wagons, compared to the English, are so evident that the

ferrocarriles europeos ni se discute la conveniencia de emplear aquellos en las líneas férreas, y los ingenieros europeos que han visitado los Estados Unidos no han encontrado otro motivo para su empleo en este país, que el estado imperfecto de la mayor parte de sus líneas férreas en donde sería peligroso hacer correr carros de cuatro ruedas ; y consideran por esta razón que la adopción del de ocho ruedas es obligatoria en la mayor parte de dicho país, pero muy desventajoso en países donde las líneas están mantenidas en buen estado. Sin embargo, en el ferrocarril del Norte los americanos tienen una aplicación parcial importante, y es en la conducción de madera de moderadas dimensiones, tráfico que ha tenido un gran desarrollo entre Sant^o y Valparaíso durante los últimos años.

MCC note – I think this is a less than subtle dig at the state of the tracks of the FC del Sur and the FC Chillan, Concepción y Talcahuano.

Los de plataforma del tipo inglés a propósito para este tráfico, que posee esta Empresa son muy insuficientes en número, y el ferrocarril se ha visto obligado a completar los de cajón a falta de aquellos. Felizmente, a causa de la firme construcción de estos carros ha sido posible empleados en objetos para lo cual no fueron construidos. Al mismo tiempo, tan luego como este ferrocarril este en aptitud de adquirir equipo adicional, conviene en beneficio del existente, (que se resiente con un trabajo extraño a su objeto) que se dé preferencia a la clase de carro que se destina o sea aparente para la conducción de maderas. Entre los del tipo inglés o americano, soy de parecer que, para este objeto se deben preferir los últimos, modificados, si, en las ruedas, frenos y enganches, porque el primero no puede emplearse sino para piezas largas, muchas que el último, aunque no tan aparente para éstas, sirve para toda carga que se puede conducir en carro de plataforma en circunstancias que casi toda la que baja por esta línea consiste en bultos pequeños. Resulta entonces que la mayor parte de los carros para madera, del tipo inglés, vuelven a Valparaíso vacíos, inconveniente que se evitaría con los del otro tipo. En este caso las desventajas del carro americano quedarían más que compensadas con el doble servicio que prestaría.

Por este motivo los coches de pasajeros del tipo americano, que poseía esta línea y que no se usaban por

desirability of employing those on railways was not discussed on European railways, and European engineers who have visited the United States have found no other reason for their employment in this country, that the imperfect state of the greater length of its railway lines where it would be dangerous to run four-wheeled wagons; and they consider for this reason that the adoption of the eight-wheeler is compulsory in most of said country, but very disadvantageous in countries where the lines are maintained in good condition. However, in the North railway the Americans have an important partial application, and it is in the carrying of wood of moderate dimensions, traffic that has had a great development between Santiago and Valparaíso in recent years.

DES note – I assume that the Author is comparing side buffers + 3-link couplings (English) with link & pin central couplings (American).

MCC note – I think this is a less than subtle dig at the state of the tracks of the FC del Sur and the FC Chillan, Concepción y Talcahuano.

Those English type flat wagons built for this traffic, which this Company owns, are very lacking in number, and the railway has been forced to deploy the high-sided ones in the absence of those. Fortunately, due to the solid construction of these wagons, it has been possible to use them for purposes for which they were not built. At the same time, as soon as this railway is capable of acquiring additional equipment, it is convenient for the benefit of the existing one, (which suffer from a task for which they were not intended) that preference be given to the type of wagon that is intended for or is suitable for carrying wood. Among those of the English or American type, it seems that, for this purpose, the latter, modified, if, on the wheels, brakes and couplings, because the former cannot be used except for long lengths, many of which the latter, although not so apparent for these, are suitable for all loads that can be carried on a flat wagon in circumstances where almost all that goes down this line consists of small packages. It turns out then that most of the English type wooden wagons return to Valparaíso empty, an inconvenience that would be avoided with those of the other type. In this case the disadvantages of the American wagon would be more than offset by the double service it would provide.

For this reason, passenger coaches of the American type, which this line owned and which were not used due to

sus inconvenientes se han convertido en carros americanos para madera como tambien otros del equipo ordinario.

Su número es, sin embargo, como ya he incinuido, mui insuficiente para las necesidades del tráfico de este ferrocarril.

Con esta escepcion, por los motivos espuestos, sería mui perjudicial el empleo jeneral del carro de carga americano en esta línea que, sea dicho de paso, tendría que fabricarse de mucho mayor solidez, y por consiguiente de mayor peso y costo que el empleado en la línea del Sur, como lo prueban los proporciones y accesorios con que han sido arreglados en los talleres de la línea del Norte, para que sean aparentes a su servicio. Tengo tambien que observar que las obras y edificios de esta línea se han ejecutado para que sirvan para el equipo actual y no se prestan para un servicio misto o distinto sino de una manera imperfecta.

Resúmen.

Resumiendo el informe que antecede resulta: – que las locomotoras que ha adoptado el ferrocarril del Norte difieren de las máquinas inglesas y americanas, así que toda comparacion hecha entre ellas no puede aplicarse a esta línea, sea cual fuere el resultado de esa comparacion. En cuanto a economía de combustible y fuerza de traccion, la máquina americana es mui inferior a las que ha adoptado este ferrocarril, segun se deduce de lo espuesto sobre aquellas por los que las fabrican y las han descrito, ademas de lo que se ha experimentado en este ferrocarril. Adoptando las americanas se tendría, pues, la seguridad de que los gastos de explotacion se aumentarían tanto con mayor consumo de combustible que exigen, como tambien con el mayor número de trenes que sería necesario hacer correr, comparado con el que sería suficiente con las máquinas actuales.

Con respecto a los coches y carros americanas, he indicado que, su uso es obligatorio en los casos de vias mal mantenidas o con curvas escepcionalmente cerradas ; pero no siendo este caso aplicable a la línea del Norte, no hai motivo alguno para gravarla con las numerosos inconvenientes que son peculiares al equipo americano y que ha ocasionado su abandono en las líneas a donde se puede emplear el carro de cuatro ruedas.

En apoyo de estos hechos me he valido principalmente de los documentos oficiales de las distintas empresas citadas y de autores de fama universal y de nacionalidad norteamericana y francesa, que tienen por especialidad un

their inconveniences, have been converted into American wagons for wood as well as other ordinary equipment.

Their number is, however, as I have already suggested, very insufficient for the traffic needs of this railway.

With this exception, for the stated reasons, the general use of the American goods wagon in this line would be very harmful, which, by the way, would have to be manufactured with much greater solidity, and therefore with greater weight and cost than that employed in the South line, as evidenced by the proportions and accessories with which they have been equipped in the workshops of the North line, to make them suitable for the service. I must also note that the works and buildings on this line have been carried out to serve the current equipment and are not suitable for a different or mixed service, but only in an imperfect way.

Summary.

Summarizing the previous report it turns out: – that the locomotives that the Northern railway has adopted differ from the English and American engines, so that any comparison made between them cannot be applied to this line, whatever may be the result of that comparison. In terms of fuel economy and traction effort, the American engine is much inferior to those adopted by this railway, as can be deduced from what is stated above those by which they are manufactured and described, in addition to what has been experienced on this railway. Adopting the American ones, then, one would have the certainty that the operating costs would increase both with the greater fuel consumption that they require, as well as with the greater number of trains that would need to be run, compared to that which would be sufficient with the present engines.

With regard to American coaches and wagons, I have indicated that their use is mandatory in cases of poorly maintained lines or exceptionally tight curves; but this case not being applicable to the North line, there was no reason to burden it with the numerous inconveniences that are associated with the American equipment and has occasioned its abandonment in the lines where the four-wheeled wagon can be used.

In support of these actions, I have mainly used the official documents of the various companies mentioned and of authors of universal distinction of North American and French nationality, who have a specially a deep

*conocimiento profundo de la materia de que se trata. He
excluido intencionalmente todo autor ingles, para emitir
de esta manera una opinion que no pueda tacharse de
parcial. Acompaño los documentos aludidos en este
informe en comprobacion de mio citas.*

*Dios Gue [Guarde] a Vd. [Vuestra Merced]
Jorge S. Lyon*

(Jorge Silvestre Lyon Santa Maria 1832-1929)

knowledge of the subject of which it is being clearly with.
I have intentionally excluded every English author, in
order to express an opinion that cannot be ignored as
being biased. I enclose the documents referred to in this
report in verification of my citations.

May God protect you
George S. Lyon

(Jorge Silvestre Lyon Santa Maria 1832-1929)
