LOCOMOTIVES AND THEIR PERFORMANCE, No. 30

THE BALDWIN LOCOMOTIVES OF THE WELLINGTON AND MANAWATU RAILWAY

By A. N. Palmer

Reprinted from the late Mr Palmer's series of articles on American-built locomotives in New Zealand published in The New Zealand Railway Observer, *Volume 2, in 1945*

PUBLICATION recently of Douglas Hoy's book *West of the Tararuas* focusses attention on the Wellington and Manawatu Railway, and it therefore seems appropriate to offer a more detailed look at some of the Company's famous locomotives. From 1888 the Company obtained all its motive power from just one manufacturer, the Baldwin Locomotive Works in the United States, and it was noted for innovations in New Zealand locomotive practice. Most readers today no doubt do not have ready access to the late Noel Palmer's series of articles on American-built locomotives for New Zealand, published in Volume 2 of this journal away back in 1945. We therefore have pleasure in presenting the following extract comprising all the text covering the Baldwin locomotives built for the WMR. Even this of course is far from the full story, but space limitations preclude any expansion for the time being.

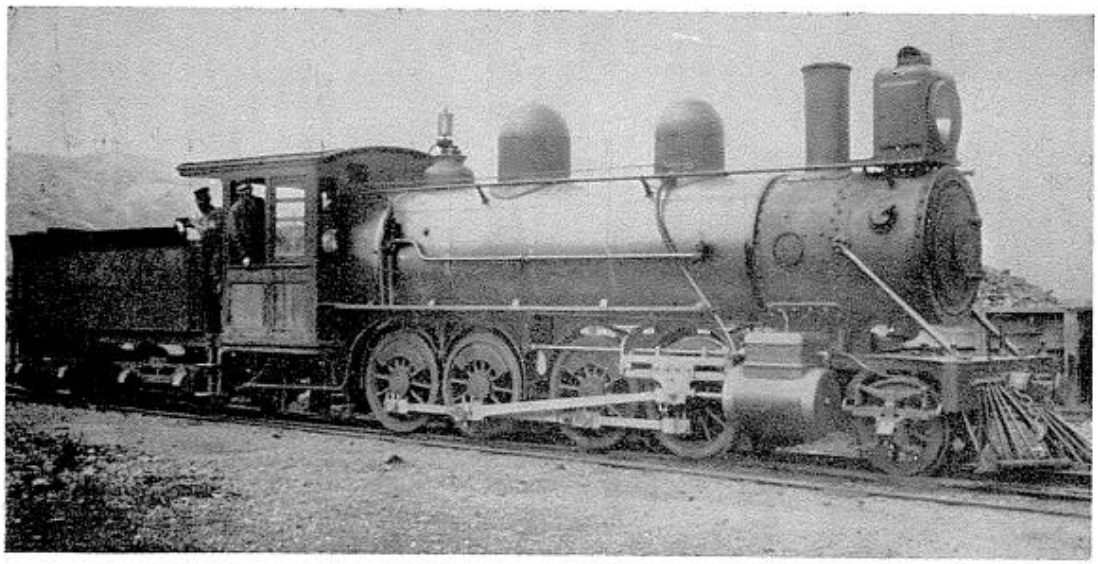
IN 1888 the Wellington and Manawatu Railway Company, whose 83-mile railway ran between Wellington (Thorndon station) and Longburn Junction, where connection was made with the NZR, decided to import some large engines of the 2-8-0 type for service on the heavily graded Wellington-Paekakariki section, 26.4 miles in length. Two engines were duly built and delivered by the Baldwin Locomotive Works, U.S.A., in 1889, being given, at first, road numbers 9 and 10. About 1891-92 they were renumbered 11 and 12, and, when the Manawatu Railway was absorbed by the Government Railways in December 1908, they became NZR "Ob" class Nos. 455 and 456. Their weight in working trim was 57 tons 11 cwt, the engine weighing 38 tons 9 cwt, while the adhesive weight was 34 tons 7 cwt. The length over couplers was 51 ft. 3 in., wheelbase 43 ft. 3½ in., and height over stack 11 ft. 8 in. The cylinders were 16 in. x 20 in., driving wheels 3 ft. 7 in., boiler pressure 140 lb/sq.in., and the heating surface 1,013 sq. ft. The grate area of the original boiler I do not know. At 80 percent of the boiler pressure the tractive force was 13,330 lb. The tender had capacity for 3½ tons of coal and 1,530 gallons of water. Stephenson gear, common to all pre-1901 American-built engines (for New Zealand), was used to actuate the usual slide valves of that era, while an interesting fitting was the Le Chatelier water brake.

These engines, which were large and more powerful than either of the NZR classes of 2-8-0s, "T" and "O", were capable of handling either passenger or freight traffic over the steep grades between Wellington and Paekakariki. In *The Engineer* of February 3, 1893, Mr C. Rous-Marten recorded that these engines "proved equal to a load of 150 tons at 16 miles an hour up a long gradient of 1 in 56, and ran a like load at 42 miles an hour on the level, averaging 36 miles an hour for 15 miles". He also mentioned the latter performance, "of the American Consolidation engine", in *The Railway Magazine* for January 1900 in the following words: "It ran a train of 18 American bogie coaches for several miles on the level at a steady speed of 36 miles an hour." Eighteen American cars would, I think, have represented nearer 200 than 150 tons. Their rated loads, as shown in the December 1908 Working Timetable, after reboilering, up the 4-mile grade of 1 in 40 between Wellington and Johnsonville, were 130 tons for passenger and 155 tons for freight trains. Between Johnsonville and Paekakariki, a section which included grades of 1 in 66 and 1 in 56 against southbound trains and 1 in 57 against northbound trains, the rated loads were 210 tons for passenger and 250 tons for freight trains

In 1906 these engines were reboilered, the boiler pressure being raised to 165 lb per sq. in. with a resultant increase, to 15,710 lb, of 18 percent in the tractive force. The heating surface in the new boilers was reduced to 935 sq. ft. (later NZR diagrams quote 929 sq. ft.) and the grate area was 16.4 sq. ft. The weights were only slightly affected by the reboilering. During their declining years Nos. 455 and 456 were located at Napier, No. 456 being written off in 1929 and No. 455 in 1931.

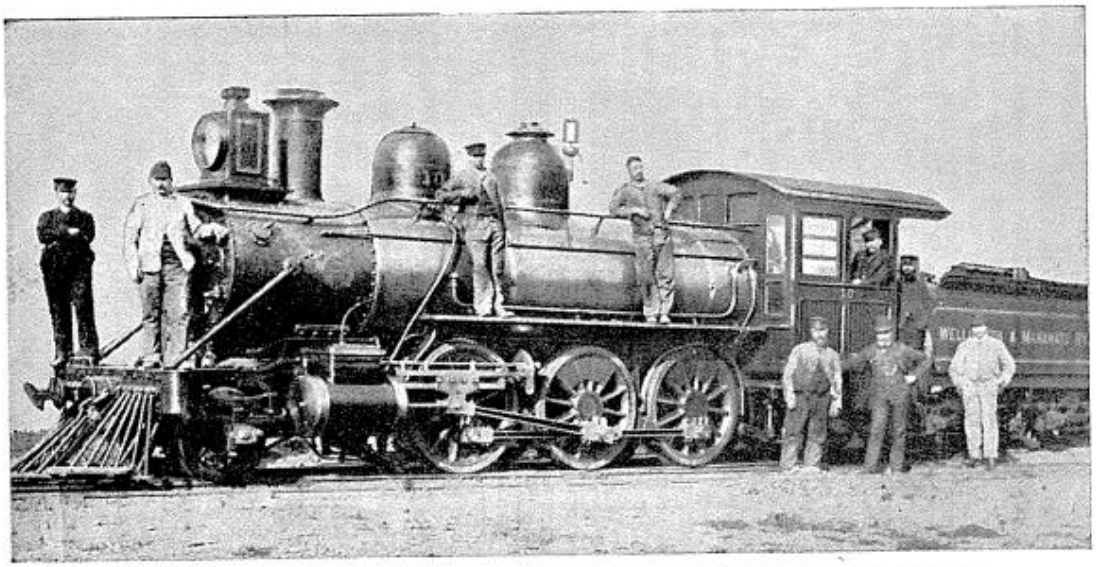
By the year 1891, traffic on the Manawatu Company's progressive railway had increased to such an extent that the three English "V" class 2-6-2 engines, Nos. 6, 7, and 8, which were built by Nasmyth Wilson in 1885, could no longer cope with the volume of work over the Paekakariki-Longburn section. These three engines, which were duplicates of the "V" class that had caused the NZR so much trouble in 1884 owing to excessive weight, were performing very good work on the Paekakariki-Longburn section and, apart from a little boiler trouble in 1889, had given the Company no cause for concern. Prior to 1891, each of the three engines had been running up annual mileages as high as 30,000 miles, and eventually the time arrived when they needed both relief and heavy repairs.

Accordingly the Manawatu Company ordered two 2-6-2 express passenger engines from Baldwin in 1891, these being Nos. 9



Photograph: courtesy Alexander Turnbull Library

WMR 2-8-0 "Consolidation" type locomotive No. 11, one of the two supplied by the Baldwin Locomotive Works in 1888 (maker's Nos. 9018 and 9021), the first Baldwin locomotives for the Company. This view shows No. 11 in its original condition. Larger than any of the NZR 2-8-0 type locomotives, Nos. 11 and 12 each scaled 57.5 tons ready for service. They became the NZR "Ob" class in 1908.



Block: courtesy New Zealand Railways

WMR 2-6-2 type "N" class locomotive No. 10, second of the two locomotives of this type built by the Baldwin Locomotive Works in 1891 and received by the Company in March 1892 (maker's Nos. 12104 and 12106). No. 10 was the locomotive used on the famous trial run of 20 July 1892, when an average speed of 60 m.p.h. was maintained for 15 miles across the Makerua Plains with a light train of about 22 tons.

and 10, later NZR "N" class engines Nos. 453 and 454. These new 2-6-2s were of a similar design to the NZR 1885 "N"s, but had a slightly larger boiler with a heating surface, as quoted in the WMR 1905 report, of 893 sq. ft. and a working pressure of 140 lb/sq.in. The tractive effort, at 80 percent, was thus 10,260 lb. Another difference was that the Manawatu locomotives were fitted with long smokeboxes and straight stacks whereas the NZR examples, when built, had short smokeboxes and spark-arresting stacks. In working trim, the adhesive weight of the Manawatu "N"s was 23 tons 9 cwt, engine weight was 31 tons 15 cwt, and the total weight of engine and tender was 50 tons 15 cwt.

On speed trials in 1892, one of these engines, No. 10, broke all existing records for the 3 ft. 6 in. gauge by attaining nearly 65 m.p.h. At 9.20 a.m. on 20 July 1892, No. 10 left Wellington with a light train composed of one car and a brake van, a tare weight of just over 20 tons. In the cab were Driver Fryer, Fireman Taylor, Mr J. E. Fulton (Chief Engineer), Mr J. Marchbanks (Assistant Engineer), and Mr C. Rous-Marten. The three latter gentlemen each independently recorded the speeds attained. Ascending the 4-mile 1 in 40 grade to Khandallah at a speed which varied between 30 and 35 m.p.h., the little locomotive took all in its stride, while the climb up the 2½ miles of 1 in 57 from Plimmerton to Pukerua Bay was accomplished without falling below 33 m.p.h. Owing to the sodden nature of the ground from heavy rain the previous day, and threatened slips, the 1 in 66 descent from Pukerua Bay to Paekakariki was made with extreme caution.

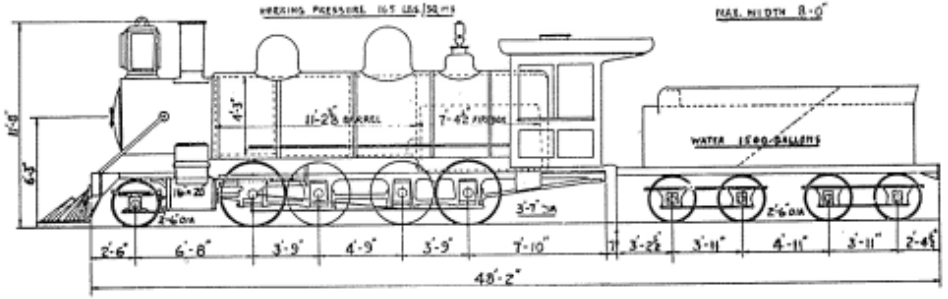
Beyond Paekakariki the train maintained a steady 50-55 m.p.h. for most of the next 20 miles to Otaki, 46.1 miles from Wellington and the first scheduled stop for the special. This distance had taken 75½ minutes, including a signal stop at Johnsonville costing 4 minutes, as well as permanent way slacks. The 37.1 miles from Otaki to Longburn are over comparatively level country, the ruling grade being 1 in 100, and the sharpest curves of 15 chains radius, except for several 10-chain curves within the first four miles. Owing to the adverse grade out of Otaki and the severe curves on the Manakau bank, the first 5.5 miles to Manakau took 9½ minutes, but speed soon rose into the "fifties" and up to a maximum of 61 m.p.h. (down 1 in 100) immediately before slackening for Kereru (now Koputaroa). Beyond Kereru, in Mr Rous-Marten's own words as published in *The Engineer* of February 3, 1893, at page 91: "The engine was put out to its full power along this straight and level line. A rate of 60 miles was soon regained, and this was maintained as an average for 15 miles continuously. It was several times slightly exceeded. Two miles were done in 59 secs. each, two in in 58 secs., one in 57 secs., and one in 56.2 secs. This was the fastest mile: but one quarter mile was run in exactly 14 secs. — equal to a speed of 64.4 m.p.h." Including a severe reduction in speed for the large wooden bridge spanning the Manawatu River near Longburn, the 37.1 miles were covered in 46 minutes start to stop at an average speed of 48.4 m.p.h., a speed equal to that attained by some of the best English express trains of that day. The overall time from Wellington to Longburn was 2hr. 6min., and the total net running time 1hr. 58min., an average speed of 42.3 m.p.h. for the 83.2-mile run over a by-no-means-easy road.

In ordinary service, the maximum rated loads from Wellington to Johnsonville for these 2-6-2s in 1908 were 80 tons for passenger and 95 tons for freight trains. Between Johnsonville and Paekakariki the ratings were 130 and 155 tons, and north of Paekakariki were 210 and 280 tons respectively. In later years, when owned by the NZR, they were transferred to the Wairarapa district, and ultimately to Westland, where they ran the mail trains between Greymouth and Otira. No. 453 was written off in 1926 and No. 454 in 1928, the latter engine being reputedly dumped in the Waimakariri River in the South Island, far from the scene of its early triumphs.

The Baldwin Works built another 2-6-2 for the Manawatu Railway in 1894, this being No. 14, later NZR "Na" class No. 459. This fine locomotive was a Vauclain compound and was rather heavier than the "N" class simples. Its total weight in working trim was 54 tons 9 cwt, of which the engine accounted for 35 tons 8 cwt. The adhesion weight was 25 tons 3 cwt. Length over couplers was 50 ft. 10 in., wheelbase 42 ft. 10 in., and height over stack 11 ft 6 in. High-pressure cylinders were 10 in. diameter and low-pressure 17 in. diameter

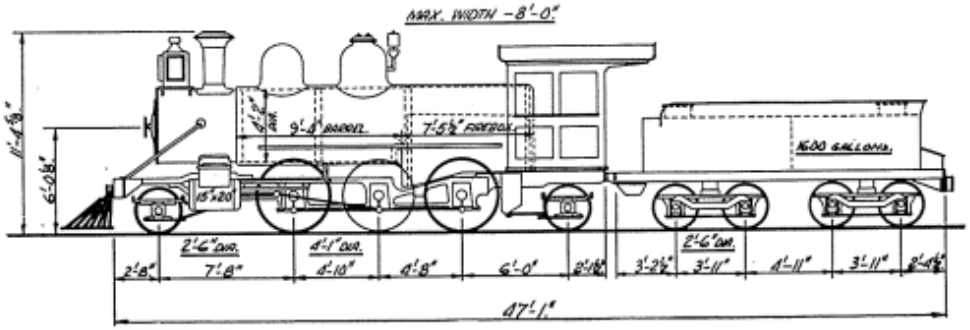
WELLINGTON AND MANAWATU RAILWAY COMPANY

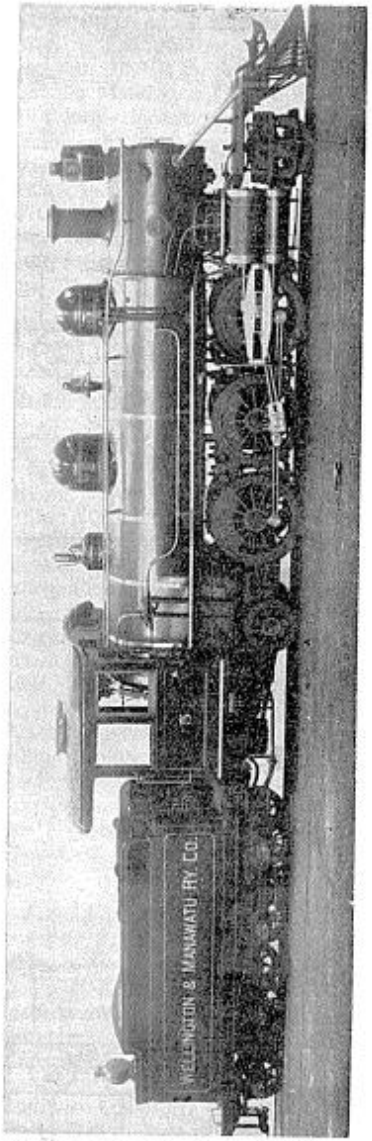
"Consolidation" Type Locomotive built 1888
by Baldwin Locomotive Works, U.S.A.
(NZR Class "Ob" after 1908)



WELLINGTON AND MANAWATU RAILWAY COMPANY

"N" Class 2-6-2 Type Locomotive built 1891
by Baldwin Locomotive Works, U.S.A.





Block: courtesy New Zealand Railways

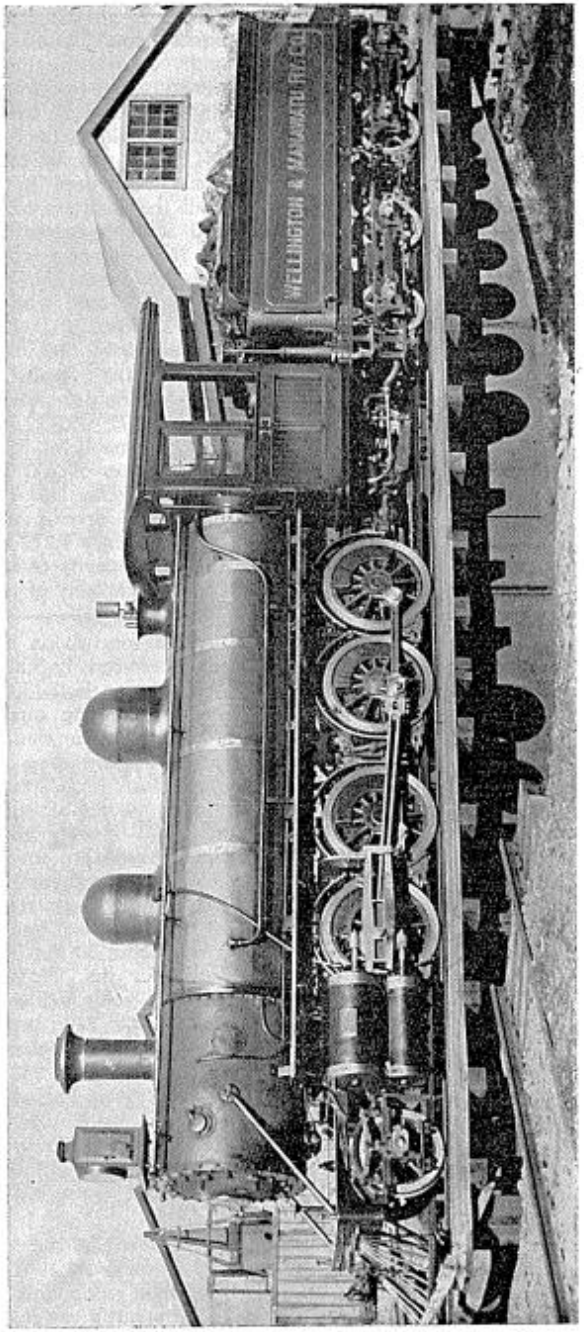
WMR Vauclain Compound 2-6-2 type locomotive No. 5 supplied by the Baldwin Locomotive Works in 1901 (maker's No. 19797). It took the place of the earlier tank locomotive No. 5, which was sold in 1900. The new locomotive later became the NZR "Nc" class No. 462.

by 20 in. stroke, driving wheels were 49 in in diameter, boiler pressure was 180 lb/sq in., heating surface was 957 sq.ft. (quoted on later NZR diagrams as 935 sq.ft.), grate area was 16.4 sq.ft., bunker capacity of tender was 3½ tons, and tank capacity was 1,330 gallons. In its 1905 report, the Manawatu Company quoted the tractive force as being 11,538 lb (probably at 85 percent of the boiler pressure, this being the Company's practice), but later NZR diagrams give the tractive force as 9,700 lb.

It is recorded that, in 1896, No. 14 hauled a train weighing 432 tons from Longburn to Paekakariki over a ruling grade of 1 in 100, no mean feat for such a small 2-6-2. The maximum rated loads for the "Na"s were given in 1908 as 95 tons and 110 tons for passenger and freight trains respectively from Wellington to Johnsonville, 150 and 180 tons between Johnsonville and Paekakariki, and 230 and 340 tons between Paekakariki and Longburn.

Another locomotive of this type was built by Baldwin in 1896, this being Manawatu No. 15, later NZR "Na" class No. 460. This engine had a boiler pressure of 200 lb/sq.in. and a tractive force as quoted by the WMR of 13,636 lb. The heating surface was given as 939 sq.ft. The weights in working trim were as follows: adhesive 28 tons 17 cwt; engine, 37 tons 19 cwt; engine and tender, 57 tons. Both Nos. 459 and 460 were written off in 1929, No. 459 having been last stationed at Cross Creek, and No. 460 at Frankton Junction.

With the 2-6-2 No. 14 supplied in 1894, the Baldwin Works also supplied a 2-8-0 similar in appearance to the "Ob" class 2-8-0s, but arranged as a Vauclain compound. Known by the Manawatu men as *The Lady*, this stately locomotive was the Company's No. 13, later to become NZR "Oa" class No. 457. Together with the two "Ob"s, the "Oa" was used to work the Company's trains over the heavily graded Wellington-Paekakariki section, their rated loads being the same. In working trim it weighed 57 tons 7 cwt, of which the engine accounted for 38 tons 7 cwt, the adhesive weight being 33 tons 14 cwt. The length over couplers was 51 ft. 8 in., wheelbase was 43 ft. 7 in., and height over stack was 11 ft. 8 in. The boiler was rather larger than those fitted to the "Ob"s, having a heating surface of 1,056 sq ft. and a grate area of 16.7 sq.ft. Cylinder dimensions were (h.p.) 11 in. and (l.p.) 18 in. diameter



Photograph: courtesy F. C. Spencer

WMR locomotive No. 13, a 2-8-0 "Consolidation" type supplied by the Baldwin Locomotive Works in 1894 (maker's No. 13908), was the first Vauclain Compound locomotive in New Zealand. As had been adopted for narrow-gauge practice, the low-pressure cylinders were mounted above the high-pressure cylinders. The feature of Samuel Vauclain's system of compounding was that both pistons (high-prossure and low-pressure) drove on to a common crosshead.

by 20 in. stroke. The boiler pressure was raised to 180 lb/sq.in. and the tractive force was quoted by the WMR in 1905 as 15,177 lb. The tender had capacity for 3¼ tons of coal and 1,300 gallons of water.

During a test in August 1894, the new compound 2-8-0 hauled a train of 83 empty four-wheel wagons, about 350 tons, up the 2½-mile 1 in 100 Koputaroa bank at 6 m.p.h., and with 25 percent less fuel consumption than No. 12 with a load of 250 tons.

On June 23, 1896, No. 13 ran into a slip on the grade south of Paekakariki and, together with several wagons, plunged over the bank to the beach below. It was thoroughly repaired after this mishap, and the opportunity was taken to effect several small improvements, including the fitting of balanced slide valves to improve its efficiency. No. 13 was finally written off in 1929, having spent the last years of its life, as NZR No. 457, at Frankton Junction.

During 1896 another 2-8-0 of an almost identical design was built by Baldwin for the Manawatu Railway, this being Manawatu No. 16, later NZR class "Oc" No. 458. Like its sister engine of class "Oa" it was of the Vauclain compound type but was rather larger and heavier. One noticeable difference lay in the irregular spacing of the coupled wheels. With the "Oa" the coupled wheels were divided into two sets of four by an exaggerated space between the second and third pairs, whereas in the case of the "Oc" the increase was between the first and second pairs. The heating surface came down to 1,038 sq.ft., but the boiler pressure was raised to 200 lb/sq.in. The tractive force was quoted in 1905 as 16,240 lb. Wheels and cylinders were of the same dimensions as those of the "Oa". The total weight in working trim was 62 tons 15 cwt, engine weight was 41 tons 15 cwt, and adhesive weight was 36 tons 15 cwt. The tank capacity of the tender was increased to 1,500 gallons.

The "Oc" was rated in 1908 to take a rather heavier load than the "Oa" between Wellington and Paekakariki, the ratings being 140 tons for passenger and 170 tons for freight trains up the hill to Johnsonville, and 225 and 280 tons respectively on to Paekakariki. It was written off in 1930 after having been stationed at Cross Creek for a time.

At the turn of the century the Government Railways had a busy time ordering and receiving large numbers of new locomotives from the United States, and the Wellington and Manawatu Railway Company itself was not at all lax in attending to the motive power requirements of its own important and rapidly progressing line. In 1901 a large, powerful, wide-firebox 2-6-2 type Vauclain compound was built by Baldwin, this being Manawatu No. 5, later NZR "Nc" class No. 461. This was by far the largest 2-6-2 that had been seen in New Zealand, and like all the Baldwin locomotives of that period was an exceptionally handsome machine. Its weight in working trim with tender was 65 tons 2 cwt, the engine weighing 41 tons 7 cwt, while the adhesive weight was 27 tons 10 cwt. The length over couplers was 54 ft. 10 in., and the wheelbase 44 ft. 2 in., the overall height being 11 ft. 8 in. The tractive force, as quoted by the WMR in 1905, was 12,574 lb working compound, presumably at 85 percent of the working pressure of 200 lb/sq. in. The cylinders were 10 in. and 17 in. diameter by 20 in. stroke, driving wheels 49 in. diameter, heating surface 1,119 sq.ft., grate area 25 sq.ft., tank capacity of tender 1,500 gallons, and bunker capacity of tender 4½ tons.

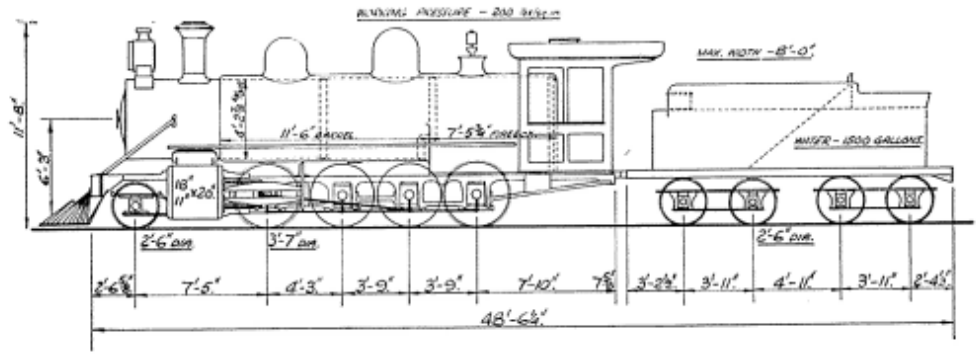
This engine, provided for use on mixed and passenger trains between Paekakariki and Longburn, soon became noted for its easy running and smooth riding qualities, the latter being attributed to the cantilever springing arrangement of the trailing bogie. In 1901 the maximum authorised speed on the Manawatu line was 40 m.p.h., and the fastest trains, Nos. 2 and 5, were allowed 3hr. 40min., including 12 stops, to cover the 83 miles between Wellington and Longburn. Allowing for stops, the average running speed over the 56.8 miles between Paekakariki and Longburn was about 30 m.p.h. The maximum rated loads for the "Nc" class between Wellington and Johnsonville were 95 tons for passenger and 110 tons for freight trains, while between Johnsonville and Paekakariki the ratings were 150 and 180 tons respectively. Between Paekakariki and Longburn the rated loads were 230 tons for passenger and 340 tons for freight trains. After being stationed at Cross Creek for some of its last years, No. 461 was written off in 1934.

The second engine ordered by the Manawatu Railway from Baldwin in 1901 was a large 2-8-2 type Vauclain compound. This was No. 17 on the Company's roster, later

(Continued on Page 80)

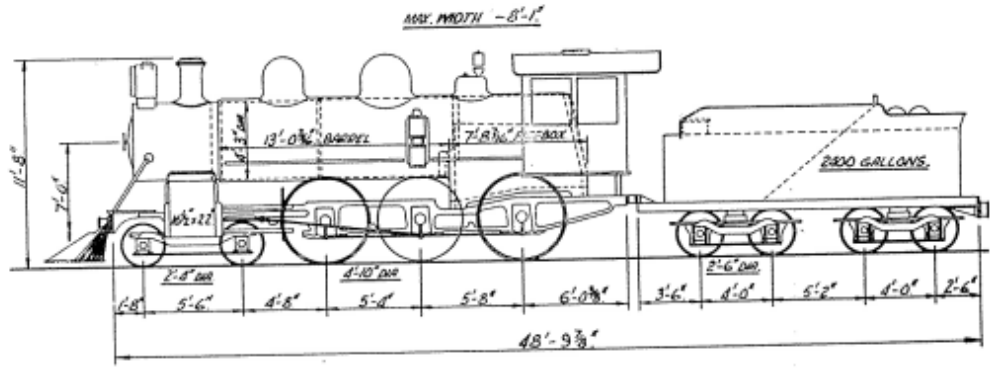
WELLINGTON AND MANAWATU RAILWAY COMPANY

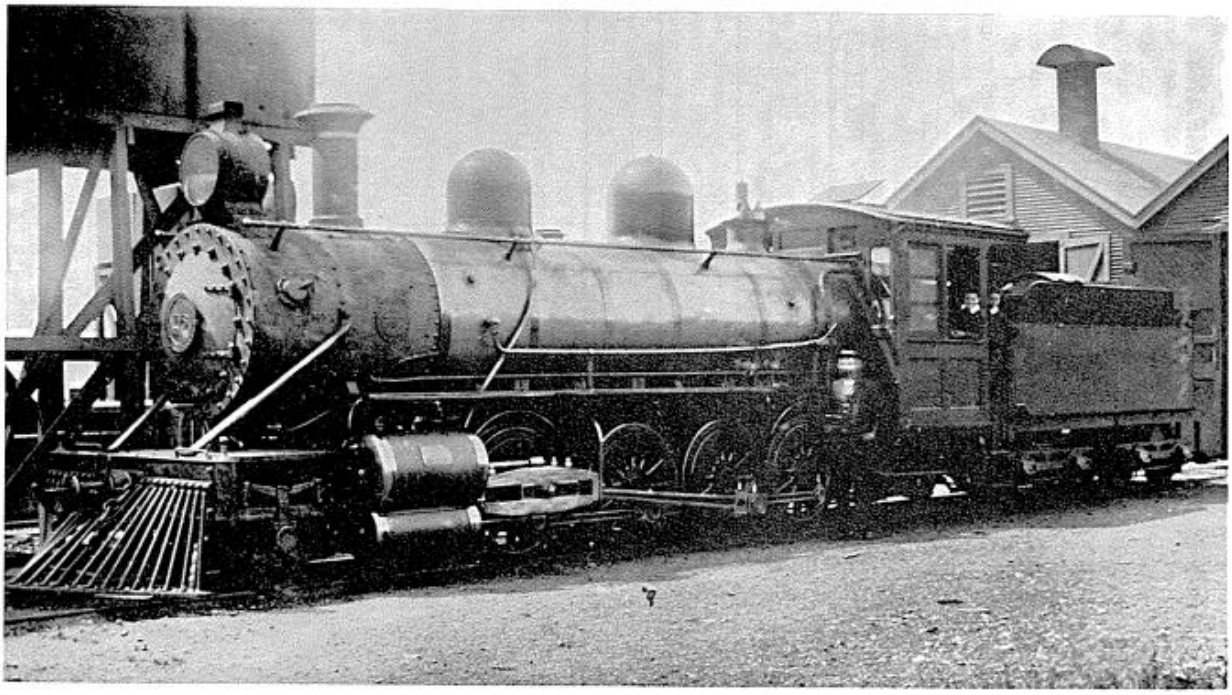
Vauclain Compound 2-8-0 Locomotive built 1896
by Baldwin Locomotive Works, U.S.A.
(NZR Class "Oc" after 1908)



WELLINGTON AND MANAWATU RAILWAY COMPANY

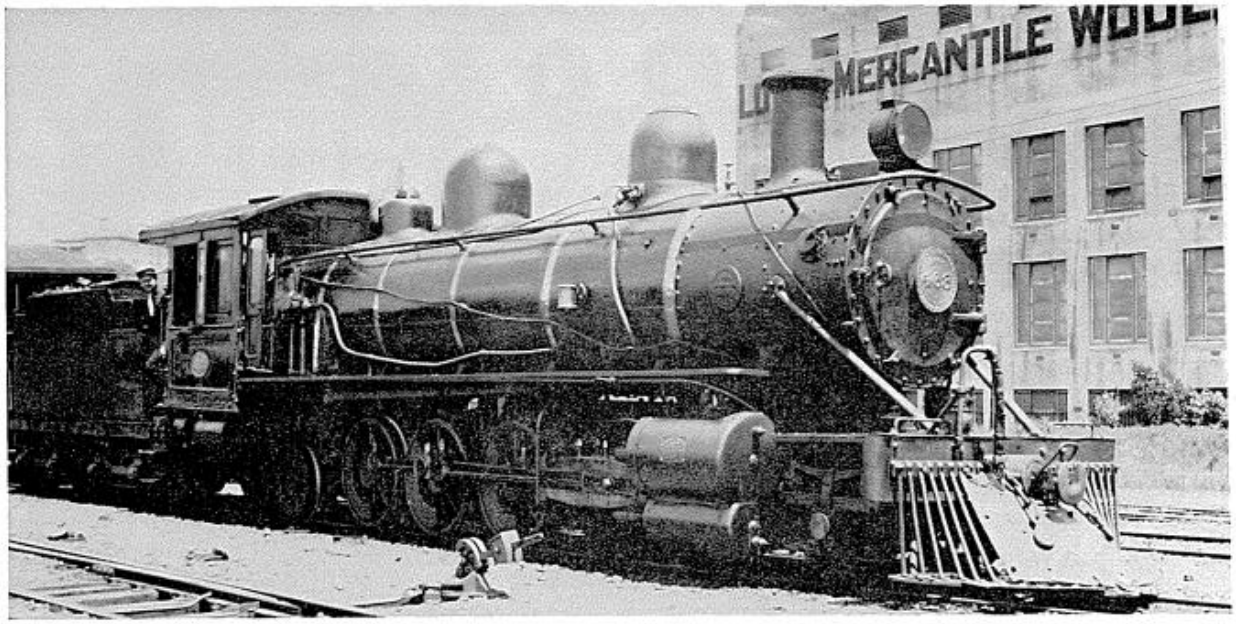
Ten-Wheel (4-6-0 Type) Locomotive built 1904
by Baldwin Locomotive Works, U.S.A.
(NZR Class "Ud" after 1908)





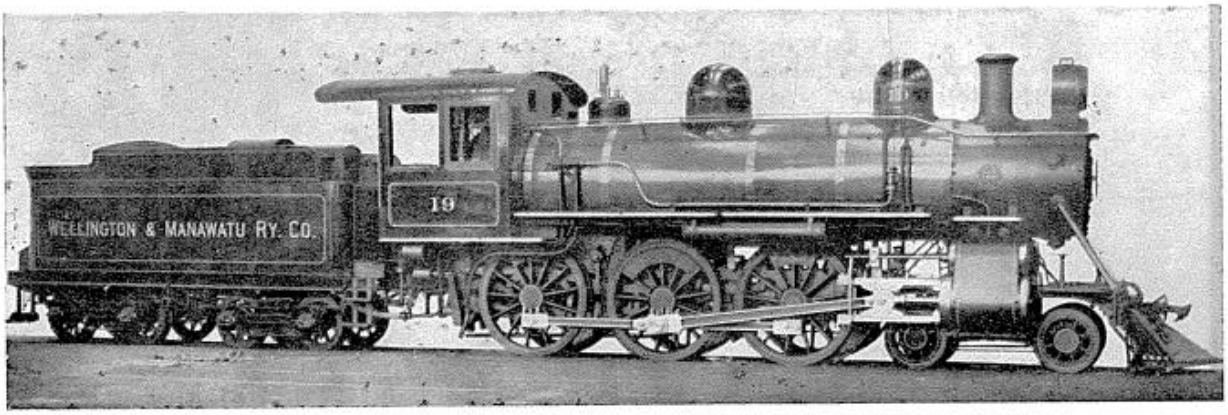
Photograph: N.Z. Railways Publicity

WMR locomotive No. 16 (Baldwin Locomotive Works No. 15055 of 1896) was the second Vauclain Compound 2-8-0 "Consolidation" type on the railway, and was slightly heavier and more powerful than No. 13. It became the NZR "Oc" class No. 458 at the close of 1908.



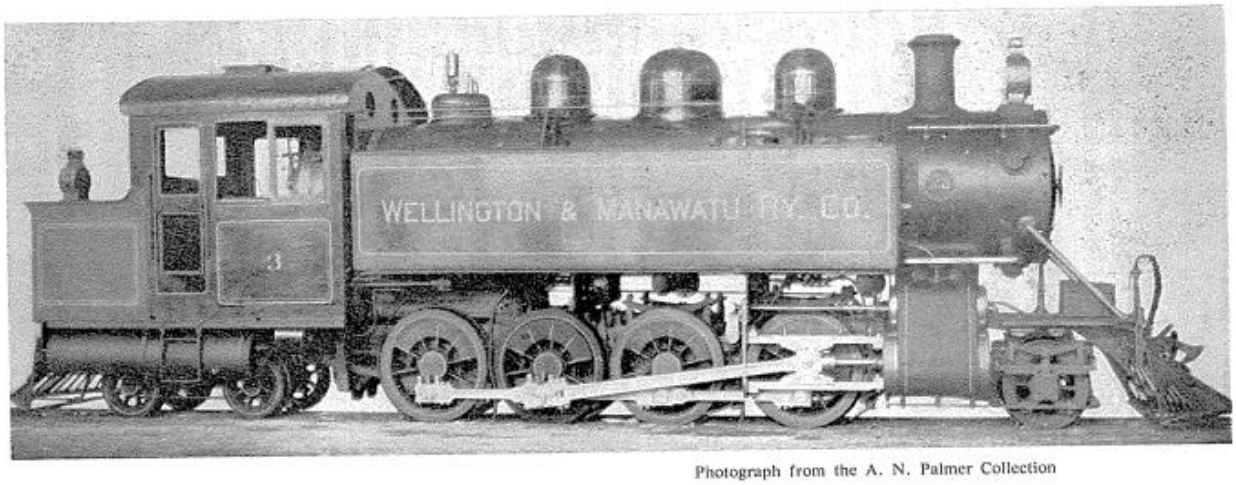
Photograph: W. W. Stewart

WMR locomotive No. 17, a 2-8-2 "Mikado" type (Baldwin Locomotive Works No. 19796 of 1901), is seen here in its later years as NZR class "Bc" No. 463. This was the largest, heaviest (at 71.4 tons), and most powerful locomotive employed by the Company.



Photograph from the A. N. Palmer Collection

WMR locomotive No. 19 (Baldwin Locomotive Works 1904, No. 24086) was a high-stepping American Ten-Wheeler, or 4-6-0 type, one of two supplied to the Company, later to become the NZR "Ud" class. They reputedly had a rare turn of speed, thanks to their 58-inch diameter coupled wheels, but were not noted for heavy work in their later years.



Photograph from the A. N. Palmer Collection

WMR 2-8-4 type tank locomotive, the Company's second No. 3 and known popularly as "Jumbo", was supplied by the Baldwin Locomotive Works in 1904. This 53½-ton machine, later to become the NZR "Wj" class No. 466, spent most of its life banking trains from Wellington to Johnsonville. It was the only 8-coupled tank locomotive ever used on New Zealand Railways.

(Continued from Page 74)

becoming NZR "Bc" class No. 463. No. 17 was the largest and heaviest engine owned by the Manawatu Railway, and indeed ranked just about equal with the NZR "Q" class 4-6-2s of 1901 for the honour of being the largest in New Zealand at that time. In working trim, with tender, its weight was 71 tons 8 cwt, of which the engine accounted for 45 tons 8 cwt, the adhesive weight being 33 tons 19 cwt. The length over couplers was 55 ft. 7 in., wheelbase 46 ft. 11½ in., and height over stack 11 ft. 8 in. The tractive force, as quoted by the WMR in 1905, was 17,667 lb at presumably 85 percent of the boiler pressure of 200 lb/sq.in., the cylinders being 11½ in. and 19 in. diameter by 20 in. stroke. The diameter of the driving wheels was 3 ft. 7 in., heating surface 1,491 sq.ft., grate area 25 sq.ft., tank capacity of tender 1,660 gallons, and bunker capacity of tender 4 tons.

This fine engine earned the reputation of being the favourite locomotive on the Manawatu Railway, being used by the Company for working trains over the steep grades between Wellington and Paekakariki. Its ratings from Wellington to Johnsonville were 140 tons for passenger and 170 tons for freight trains, while between Johnsonville and Paekakariki the loads were 225 and 280 tons respectively. Those who were intimately connected with this fine old engine must have very much regretted seeing it written off in 1926, and no doubt its handsome outline was missed from its usual Wellington haunts for some time.

The next American order from New Zealand was not placed until 1904 when the Manawatu Railway, again finding its motive power hard-pressed, ordered a further four locomotives. One of these was another 2-6-2 Vauclain Compound similar to No. 5, this later engine being No. 18, later NZR "Nc" class No. 462. It was practically identical to the 1901 engine, except that it was provided with a steel cab instead of a wooden one. In working trim it weighed 63 tons 7 cwt, of which the engine accounted for 39 tons 12 cwt, the adhesive weight being 27 tons 6 cwt. The tractive effort was quoted by the WMR in 1905 as being 12,574 lb, although later NZR diagram blueprints quote it as 10,800 lb, evidently at 80 percent of the boiler pressure, which was 200 lb per sq.in. The grate area was 20.4 sq.ft., heating surface (WMR figures in 1905) 1,119 sq.ft., and height over stack 11ft. 4½in. In later years No. 462 was fitted with a stovepipe stack, and it may be safely said that this did not enchance its appearance. As No. 462 this engine saw considerable service on the Wairarapa line, working out of Cross Creek. Its writing-off was authorised in 1928.

The most outstanding locomotive on the Manawatu Railway's 1904 order was a very powerful 2-8-4 side-tank engine, this being WMR No. 3, later NZR "Wj" class No. 466. It was stationed at Wellington for many years, and was used to haul or bank trains over the heavy grades to Paekakariki. A well-known identity to Wellington citizens of bygone years, it was known to all by the very appropriate, though unofficial, nickname of *Jumbo*. In working trim, No. 3 weighed 53 tons 13 cwt, of which 38 tons 5 cwt was available for adhesion. The overall length was 37ft. 2in., overall width 8ft. 0in., and overall height 11ft. 6in. The WMR worked the engine at 190 lb per sq.in., with a resultant tractive effort, at 80 percent boiler pressure, of 20,430 lb, but in later years, when owned and operated by the NZR, it was worked at 200 lb per sq.in., and the tractive effort became 21,510 lb. Cylinders were 17in. x 20in., the outside piston valves being actuated by inside Stephenson valve gear. The driving wheels were 3ft. 7in. in diameter, grate area was 16.5 sq.ft., heating surface 1,100 sq.ft., coal capacity of bunker 2½tons, and water capacity of side tanks 930 gallons.

Jumbo was rated to haul 140-ton passenger trains and 175-ton freight trains up the heavy grade from Wellington to Johnsonville, while between Johnsonville and Paekakariki the ratings were 230 and 285 tons respectively.

In common with all Baldwin engines, *Jumbo* had bar frames. In this instance they had a habit of breaking immediately behind the smokebox saddle, and the NZR experienced considerable trouble of this kind. *Jumbo* appears to have been used almost exclusively for piloting or banking on the Johnsonville grade right up until withdrawal was authorised in 1927. It is believed that its boiler was afterwards in use at the Taihape locomotive depot. Like many other fine engines that have operated on the NZR, *Jumbo's* early demise may be attributed to the fact that it was the only specimen of the class.

The last two engines built for the Wellington and Manawatu Railway were supplied, as usual, by Baldwin, being built in 1904. They were of the 4-6-0 type and were numbered 19 and 20, later becoming NZR "Ud" class Nos. 464 and 465. These were the largest and heaviest locomotives of the 4-6-0 type ever to run in New Zealand, and they had the largest driving wheels ever fitted to a narrow-gauge locomotive in this country. Their weight in working trim was 66 tons 17 cwt, of which the engine accounted for 39 tons 9 cwt, the adhesive weight being 29 tons 4 cwt. The length overall was 51ft. 6in., wheelbase 44ft. 4in., and height overall approximately 12 feet. The tractive effort at 80 percent of the working pressure of 185 lb per sq.in. was 15,290 lb. The driving wheels were 4ft. 10in. in diameter, cylinders were 16½in. x 22in., grate area was 16.5 sq.ft., and total heating surface 1,089 sq.ft. The tender had a bunker capacity of 4 tons and a tank capacity of 2,000 gallons. Outside piston valves were actuated by inside Stephenson valve gear.

As a result of the introduction of these faster and slightly more powerful locomotives, the Manawatu Railway was able to substitute them for the 2-6-2s on the Mail Trains, Nos. 4 and 7. By this time these trains were running right through to and from New Plymouth, being operated north of Longburn Junction by the NZR. This arrangement was brought into operation in October 1902, and saved the necessity for passengers having to change trains at Longburn, the trains being composed of WMR cars on Mondays and Thursdays, and NZR cars on Tuesdays, Wednesdays, Fridays, and Saturdays. The schedules of both trains were reduced by 10 minutes (from 1 November 1904), thus bringing the overall time down to 3hr. 30min. for the 83 miles from Wellington to Longburn. The "Ud"s were on a number of occasions roughly recorded at speeds of 60 m.p.h. and more when hauling these trains, and there is no doubt that, had their speed potentialities been exploited, some remarkable runs could have been recorded. The rated loads for the "Ud"s between Paekakariki and Longburn were 250 tons for passenger and 350 tons for freight trains.

(Concluded on page 85)

Photograph: N.Z. Railways Publicity

The Erecting Shop at the Hillside railway workshops, Dunedin, in 1962, showing a number of steam locomotives undergoing repairs and overhauls. At least two "Ja" class 4-8-2 locomotives are in evidence, and the tender of a "Ba" class 4-8-0 in the foreground.

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Although they performed quite satisfactorily on the Manawatu trains, the NZR did not regard them as being a very serviceable class of engine, which no doubt was the prime factor in their being written off at the comparatively early age of 24 years. Both engines were written off in 1928, and by 1931 they had been withdrawn from service. They were last stationed at Frankton Junction, being used mainly on the Frankton Junction-Paeroa section, but some years previously they had been used for the haulage, among other duties, of the "Wairarapa Mail" trains between Cross Creek and Woodville.

In 1908 the Wellington-Auckland Main Trunk line was nearing completion and the Government had decided the time had come when the Company's railway would have to be incorporated into the State railway system. A bill known as the "Wellington and Manawatu Railway Purchase Bill" became law in September 1908, and the railway became State property on 7 December 1908, the purchase price being £915,000. Included in the 20 locomotives taken over with the railway were the 14 Baldwin engines that have been described in this survey.