CPR
5400 CLASS
MIKADO
LOCOMOTIVES

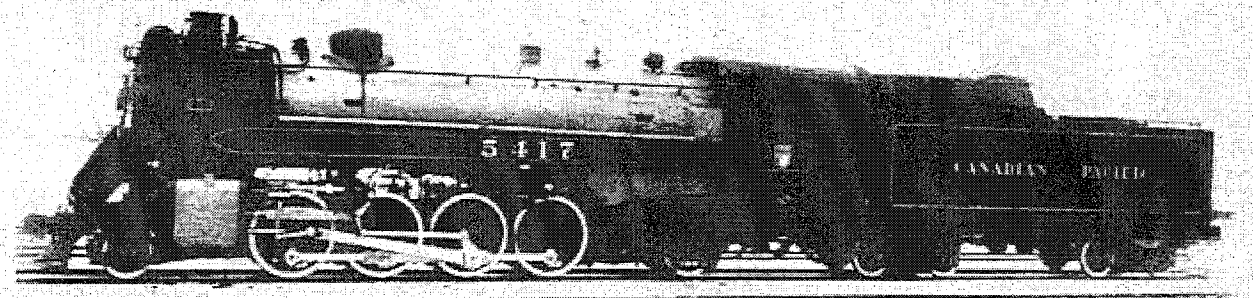
Mikado Locomotives for C.P.R.

The first of 20 Mikado (2-8-2) locomotives being built for the Canadian Pacific by Canadian Locomotive Co. was delivered March 31. All are expected to be in service by the end of this summer.

BRINGING to 84 the number of new locomotives acquired by the Canadian Pacific Ry. since the outbreak of war, 20 new freight locomotives of Mikado type are being added to the company's motive power this year, the first one, illustrated herewith, having been delivered to the company on March 31. These locomotives, which were ordered from Canadian Locomotive Co., Ltd., are, so far as is known, the first in Canada in which considerable Canadian-made boiler shell plate has been used. The need for these new locomotives is shown by the figures recording the increase in freight gross ton mileage since 1939. This gross ton mileage, in millions, increased from 44,934 in 1939 to 49,991 in 1940, to 65,321 in 1941 and to 67,339 in 1942. By percentages, the 1940 movement was 11.2% over that of 1939; the 1941 movement 30.6% over that of 1940, and the 1942 movement 4% over that of 1941.

The new locomotives, being built to the specifications of H. R. Bowen, Chief of Motive Power and Rolling Stock, C.P.R., are being numbered from 5417 to 5436 inclusive; they will be distributed evenly over the system, with ten remaining on Eastern Lines and ten going to Western Lines. With total weight of 287 tons for locomotive and tender, the new locomotives are in the P2h class. With 63 in. driving wheels and 22 x 32 in. cylinders, they carry schedule, but they are so counterbalanced that they can be employed for heavy passenger train work when required, making them suitable for hauling long troop trains. As stated, these locomotives are having much Canadian-made boiler shell plate employed in their construction. In addition, much tender tank plate manufactured in Canada is being used. Before the war, all tank and boiler shell plate was imported from the United States and England. Jacket steel of Belgian manufacture, always the first choice for C.P.R. locomotives before Belgium was over-run by the Nazis, is being replaced by a Canadian-made product. These produced-in-Canada steels were provided by the Steel Co. of Canada, to meet the C.P.R. specifications. The wheels and tires, formerly imported from England, were secured in the United States. As stated, when all of these 20 Mikados are delivered, the C.P.R. will have added 84 new locomotives since war broke out. The other 52 are of the Pacific or 4-6-2 type.

We hope to describe the new Mikado locomotives quite fully in an early future issue.



The First of 20 Mikado Freight Locomotives Built for the C.P.R. by Canadian Locomotive Co.
Delivered on March 31, the locomotive entered service without loss of time, and is now engaged in the vital task of keeping Canada's war materials rolling on schedule.

Railway Freight Traffic

Freight loaded on Canadian railways and received from foreign connections was, in tons:—

	Dec., 1942	Dec., 1941	Dec., 1940

Locomotive Production in United States

Locomotives shipped by the United States builders in January totalled 159, made up of 104 steam and 55 Diesel-electric. In January, 1942, shipments totalled 89 locomotives, viz., 19 steam, 57 Diesel-electric and 13 other, and the January, 1941, shipments totalled 64 locomotives, viz., 16 steam, 43 Diesel-electric and five other. Shipments in the complete year 1942 totalled 1,602 locomotives, viz., 715 steam, 22 straight electric, 787 Diesel-electric and 78 other. In all of 1941, shipments totalled 970 locomotives, viz., 182 steam, 18 straight electric, 712 Diesel-electric and 58 other. In "other" are included steam-electric, Diesel-mechanical, gasoline-electric and gasoline-mechanical locomotives.

Unfilled orders on the books of the locomotive builders at the end of January this year were for a total of 2,043 units, viz., 1,249 steam, 43 straight electric, 746 Diesel-electric and five other.

The foregoing figures do not include locomotives produced in railway shops, or rebuilt and rewritten into railway property accounts. In January this year, there were 17 steam locomotives built or rebuilt in railway shops, and in all of 1942 railway shops built or rebuilt 82 locomotives, viz., 64 steam and 18 electric. At the end of January this year, railway shops had orders for the building or rebuilding of 96 steam and 13 electric locomotives, a total of 109.

Figures in the foregoing are supplied by the Bureau of the Census, U.S. Department of Commerce.

C.N.R. Cincinnati Office

The Canadian National Rys. office in Cincinnati, Ohio, celebrated an anni-

MAY 1943

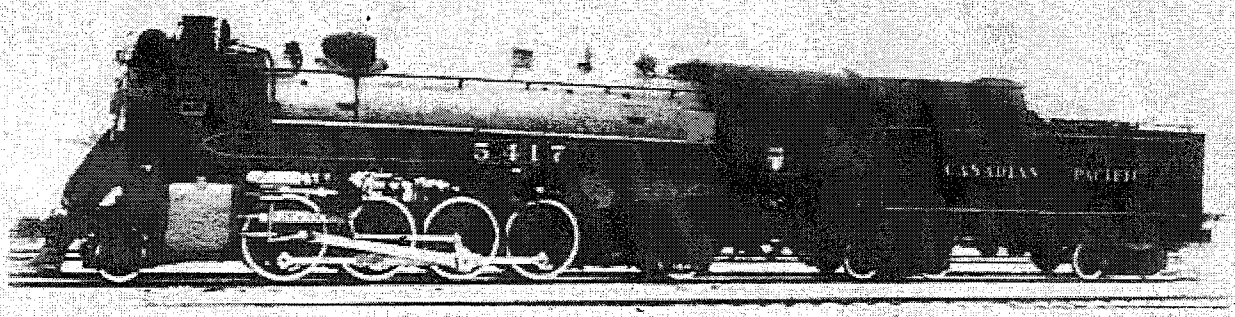
need for these new locomotives is shown by the figures recording the increase in freight gross ton mileage since 1939. This gross ton mileage, in millions, increased from 44,934 in 1939 to 49,991 in 1940, to 65,321 in 1941 and to 67,339 in 1942. By percentages, the 1940 movement was 11.2% over that of 1939; the 1941 movement 30.6% over that of 1940, and the 1942 movement 4% over that of 1941.

The new locomotives, being built to the specifications of H. B. Bowen, Chief of Motive Power and Rolling Stock, C.P.R., are being numbered from 5417 to 5436 inclusive; they will be distributed evenly over the system, with ten remaining on Eastern Lines and ten going to Western Lines. With total weight of 287 tons for locomotive and tender, the new locomotives are in the P2h class. With 63 in. driving wheels and 22 x 32 in. cylinders, they carry boiler pressure of 275 lb. and develop 57,500 lb. maximum tractive effort.

Twelve other Mikado locomotives have been acquired by the C.P.R. since the war started, these being of the P2g class, built in 1940; numbered in the 5400 series, all were placed in service on the Algoma district.

A feature of the new locomotives, differentiating them from the 12 Mikados sent to the Algoma district, is that the steam dome is being omitted on this latest group. Not only are the new locomotives destined to play a big part in keeping vital war materials rolling on choice for C.P.R. locomotives before Belgium was over-run by the Nazis, is being replaced by a Canadian-made product. These produced-in-Canada steels were provided by the Steel Co. of Canada, to meet the C.P.R. specifications. The wheels and tires, formerly imported from England, were secured in the United States. As stated, when all of these 20 Mikados are delivered, the C.P.R. will have added 84 new locomotives since war broke out. The other 52 are of the Pacific or 4-6-2 type.

We hope to describe the new Mikado locomotives quite fully in an early future issue.



The First of 20 Mikado Freight Locomotives Built for the C.P.R. by Canadian Locomotive Co.
Delivered on March 31, the locomotive entered service without loss of time, and is now engaged in the vital task of keeping Canada's war materials rolling on schedule.

Railway Freight Traffic

Freight loaded on Canadian railways and received from foreign connections, in tons:—

	Dec., 1942	Dec., 1941	Dec., 1940
Prince Edward Island	22,787	16,484	18,649
Nova Scotia	662,221	749,866	649,317
New Brunswick	298,315	274,955	238,210
Quebec	1,566,254	1,719,496	1,298,321
Ontario	5,591,989	4,542,256	3,705,111
Manitoba	462,729	519,786	468,936
Saskatchewan	463,296	590,135	444,614
Alberta	922,694	932,968	976,522
British Columbia	778,342	744,833	623,987
Total	11,258,914	10,878,779	8,484,668
The products, in tons, were:—			
Agricultural	3,119,717	2,294	[illegible]
Animal	290,847	252,009	[illegible]
Mine	4,159,876	3,681,242	[illegible]
Forest	923,569	871,187	[illegible]
Manufactures and miscellaneous	2,693,975	3,941,657	2,400,471
Total	11,258,914	10,878,779	8,484,668

locomotive builders at the end of January this year were for a total of 2,043 units, viz., 1,249 steam, 43 straight electric, 746 Diesel-electric and five other.

The foregoing figures do not include locomotives produced in railway shops, or rebuilt and rewritten into railway property accounts. In January this year, there were 17 steam locomotives built or rebuilt in railway shops, and in all of 1942 railway shops built or rebuilt 82 locomotives, viz., 64 steam and 18 electric. At the end of January this year, railway shops had orders for the building or rebuilding of 96 steam and 13 electric locomotives, a total of 109.

Figures in the foregoing are supplied by the Bureau of the Census, U.S. Department of Commerce.

C.N.R. Cincinnati Office

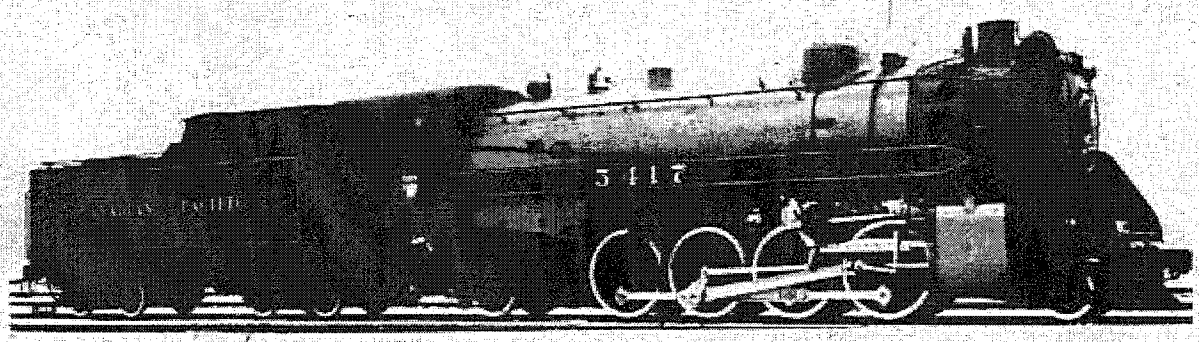
The Canadian National Rys. office in Cincinnati, Ohio, celebrated an anniversary at the beginning of this year, it having been founded in January, 1893, by the Grand Trunk Ry. Co. of Canada. The agency has been maintained uninterruptedly since that time, and now functions as that of the Canadian National, covering portions of Ohio, Indiana, Tennessee and all of Kentucky. The bituminous coal trade brings much business to this agency, and during 1942 over 42,000 cars of coal from the area were routed via the C.N.R. Incidentally, Cincinnati is the third largest railway center in the United States, Chicago ranking first and New York second.

MAY 1943

Canadian Transportation

New Mikado Locomotives on C.P.R.

Delivery is proceeding by Canadian Locomotive Co., to the Canadian Pacific, of 20 2-8-2 freight locomotives of the P2h class, having 22 x 32 in. cylinders and 63 in. drivers, and, with boiler pressure of 275 lb., developing 57,500 lb. tractive effort.



The First of 20 New Mikado Locomotives Being Built for the Canadian Pacific by Canadian Locomotive Co.
This locomotive was delivered on March 21, and lost no time in entry into service.

PRELIMINARY reference was made in Canadian Transportation for May to the first of 20 new freight locomotives to be delivered to the Canadian Pacific Ry. by Canadian Locomotive Co., Ltd., Kingston, Ont., in an order for 20. These locomotives, designated as of the P2h class, are, so far as is known, the first in Canadian railway service in which Canadian-made boiler shell plate is employed to considerable extent. The new locomotives, built to the specifications of H. B. Bowen, Chief of Motive Power and Rolling Stock, C.P.R., are being numbered 5417 to 5436 inclusive; ten of them are destined for operation on the Eastern Lines, and an equal number on Western Lines. At time of writing, the exact distribution of weight on the two-wheel leading truck, on the four pairs of drivers, and on the two-wheel trailing truck is not available; total weight of locomotive is approximately 339,000 lb., while weight of tender in working order is 258,000 lb. The following are the leading dimensions, etc.:—

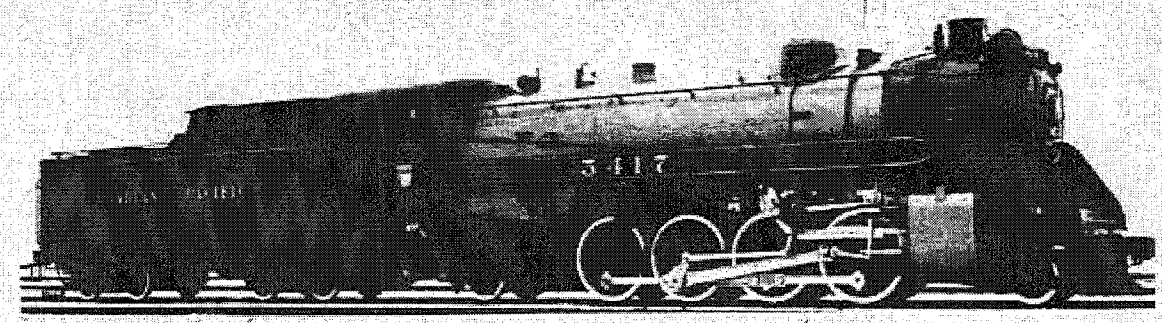
Wheelbase, driving	16 ft. 8 in.
Wheelbase, rigid	16 ft. 8 in.
Wheelbase, loco.	35 ft. 11 in.
Wheelbase, loco. and tender	78 ft. 9 in.
Cylinder, diam. and stroke	22 x 32 in.
Boiler pressure	275 lb. per sq. in.
Diam. of driving wheels	63 in.
Boiler:	
Diam. inside, first ring	71½ in.
Firebox, length and width	10 ft. 0 1/16 in. x 7 ft. 0½ in.
Combustion chamber, length	2 ft. 3 in.
Grate area	70.3 sq. ft.
Tubes, number and diam.	168-2¼ in. and 32-2 in.
Flues, number and diam.	45-5½ in.
Distance between tube sheets	17 ft. 10⅝ in.
Heating surfaces:	
Firebox, combustion chamber and arch tubes	316 sq. ft.
Tubes and flues	3128 sq. ft.
Superheating	950 sq. ft.

These locomotives are being built under the wartime regulations which have "frozen" locomotive designs for the duration of the war, and which were adopted in view of the scarcity of engineering personnel and of the desire to reduce the labor and material costs incidental to development and to the production of pattern and die equipment. The necessity of keeping within the limits of the "freezing" order, and the delays attendant upon securing substitute materials required, coupled with the shortage of skilled labor, have retarded delivery of these locomotives. The first one was received some 15 months after the order was placed in January, 1942; under ordinary conditions all 20 locomotives would be delivered and in service within that length of time.

June 1943

New Mikado Locomotives on C.P.R.

Delivery is proceeding by Canadian Locomotive Co., to the Canadian Pacific, of 20 2-8-2 freight locomotives of the P2h class, having 22 x 32 in. cylinders and 63 in. drivers, and with boiler pressure of 275 lb., developing 57,500 lb. tractive effort.

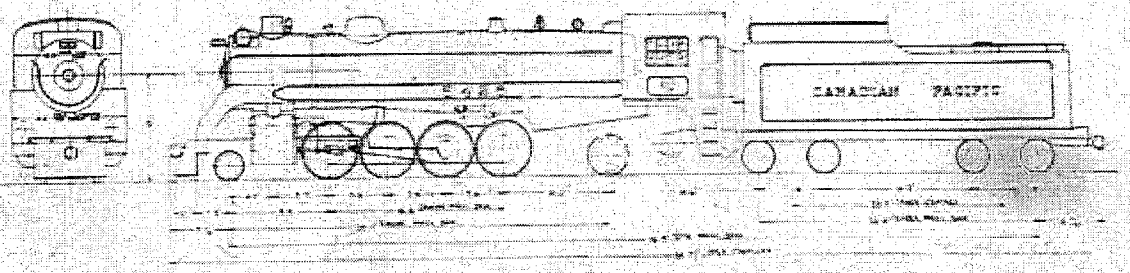


The First of 20 New Mikado Locomotives Being Built for the Canadian Pacific by Canadian Locomotive Co.
This locomotive was delivered on March 31, and lost no time in entry into service.

PRELIMINARY reference was made in Canadian Transportation for May to the first of 20 new freight locomotives to be delivered to the Canadian Pacific Ry. by Canadian Locomotive Co., Ltd., Kingston, Ont., in an order for 20. These locomotives, designated as of the P2h class, are, so far as is known, the first in Canadian railway service in which Canadian-made boiler shell plate is employed to considerable extent. The new locomotives, built to the specifications of H. B. Bowen, Chief of Motive Power and Rolling Stock, C.P.R., are being numbered 5417 to 5436 inclusive; ten of them are destined for operation on the Eastern Lines, and an equal number on Western Lines. At time of writing, the exact distribution of weight on the two-wheel leading truck, on the four pairs of drivers, and on the two-wheel trailing truck is not available; total weight of locomotive is approximately 329,000 lb., while weight of tender in working order is 258,000 lb. The following are the leading dimensions, etc.:—

Wheelbase, driving	18 ft. 6 in.
Wheelbase, rigid	18 ft. 6 in.
Wheelbase, loco.	33 ft. 11 in.
Wheelbase, loco. and tender	76 ft. 9 in.
Cylinder, diam. and stroke	22 x 32 in.
Boiler pressure	275 lb. per sq. in.
Diam. of driving wheels	63 in.
Boiler:	
Diam. inside, first ring	73½ in.
Firebox, length and width	96 ft. 6 1/16 in. x 7 ft. 0¼ in.
Combustion chamber, length	3 ft. 3 in.
Grate area	58.3 sq. ft.
Tubes, number and diam.	158-2¼ in. and 32-2 in.
Flues, number and diam.	40-5½ in.
Distance between tube sheets	17 ft. 10⅞ in.
Heating surfaces:	
Firebox, combustion chamber and arch tubes	316 sq. ft.
Tubes and flues	3128 sq. ft.
Superheating	870 sq. ft.

These locomotives are being built under the wartime regulations which have "frozen" locomotive designs for the duration of the war, and which were adopted in view of the scarcity of engineering personnel and of the desire to reduce the labor and material costs incidental to development and to the production of pattern and die equipment. The necessity of keeping within the limits of the "freezing" order, and the delays attendant upon securing substitute materials required, coupled with the shortage of skilled labor, have retarded delivery of these locomotives. The first one was received some 15 months after the order was placed in January, 1942; under ordinary conditions all 20 locomotives would be delivered and in service within that length of time.



One of the Canadian Pacific New Mikado Locomotives in Elevation.

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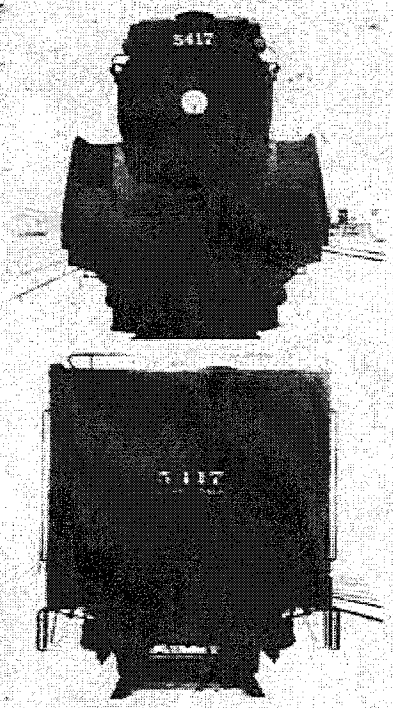


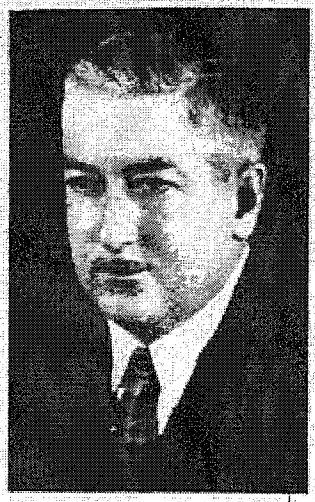
Upper, Head-on View of the First of the New Mikado Locomotives Delivered; Lower, the Rear of the Tender.

The use of Canadian-made boiler shell plate in considerable quantity does not represent the only departure from peacetime materials in the construction of these locomotives. Another example of such a departure is the use, in quantity, for the first time, of tender tank plate of Canadian manufacture. Prior to the war, tank and boiler shell plate for Canadian locomotive construction originated in England and the United States. Another new development is the use of Canadian-made jacket steel. Before the war, the jacket steel used in building C.P.R. locomotives came from Belgium. This material has been unavailable since Belgium was overrun by the Nazis. The Canadian-made boiler and tender tank plate and jacket steel, for these locomotives, was developed by the Steel Co. of Canada,

in Northern Ontario, and five were of Royal Hudson (4-6-4) type, numbered from 2860 to 2864 and built in 1940, these having gone to the British Columbia District. The use of materials of other than customary origin was evident as concerns a few of the Pacific type locomotives; in that instance, four-piece welded wrapper sheets of steel produced in Canada were used, in order to avoid delay in delivery; ordinarily, one large single wrapper sheet of steel obtained from the United States is used.

An important difference between the Mikado locomotives of the P2h class and the 12 locomotives of similar wheel arrangement, in the P2g class, is that the P2g locomotives are fitted with the conventional steam dome, whereas the locomotives now building have the dome omitted, and employ an internal steam collecting pipe, an arrangement which has been applied on certain preceding lots of C.P.R. locomotives.

In the boilers of the P2h class locomotives, the high tensile steel used in the first course is $\frac{9}{16}$ in. thick, while that used in the second and third courses is 27/32 in. thick. The firebox is equipped with a brick arch carried on four $3\frac{1}{2}$ in. diam. arch tubes. An Elesco type K-40 feedwater heater is located on top of the smoke box. On the left side, the boiler is fed by an Elesco type CF-1 feedwater pump, located between the main and rear drivers. This pump is supported on a bracket attached to the main frame, and has capacity of about 80,000 lb. per hour. At the right side, the boiler is fed by a Hancock type 2-W-5000 inspirator. Three Okadee type FSD $1\frac{1}{2}$ in. blow-off cocks are applied. One is located at the right front corner of the firebox, and is equipped with a sludge removing pipe extending across the throat sheets; one is located at the left back corner of the firebox, and is equipped with a sludge removing pipe

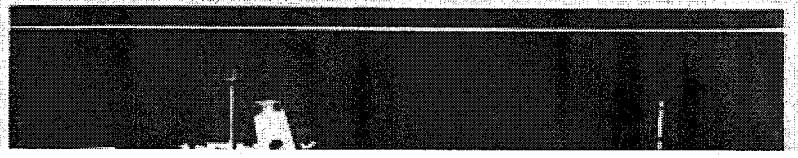


H. B. Bowen,
Chief of Motive Power and Rolling Stock, C.P.R., responsible for the design of the Mikado locomotives described herein.

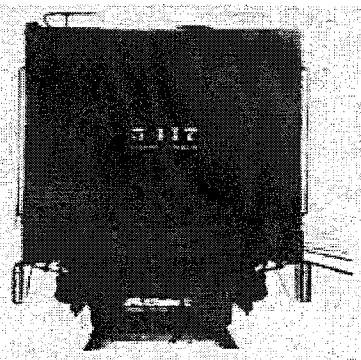
extending across the boiler back head, and the third is at the left side of the firebox.

There are three McAvity World Consolidated flanged type safety valves, of which two are plain and one is muffled. The solid and hollow staybolts are of Atlas steel, and the Flannery flexible staybolts have the telltale holes copper coated.

These locomotives are fitted with turrets for both superheated and saturated steam, both turrets being of McAvity manufacture. The superheated turret supplies steam for the stoker engine, air compressor, water pump, whistle and blower, while saturated steam is supplied from the other turret for the inspirator, dynamo, steam heat, hydrostatic lubricator, force feed lubricator heater and automizers; and also to the auxiliary heater lines to feed pump suction lines, inspirator, etc.



JUNE 1943



Upper, Head-on View of the First of the New Mikado Locomotives Delivered; Lower, the Rear of the Tender.

The use of Canadian-made boiler shell plate in considerable quantity does not represent the only departure from peacetime materials in the construction of these locomotives. Another example of such a departure is the use, in quantity, for the first time, of tender tank plate of Canadian manufacture. Prior to the war, tank and boiler shell plate for Canadian locomotive construction originated in England and the United States. Another new development is the use of Canadian-made jacket steel. Before the war, the jacket steel used in building C.P.R. locomotives came from Belgium. This material has been unavailable since Belgium was overrun by the Nazis. The Canadian-made boiler and tender tank plate and jacket steel, for these locomotives, was developed by the Steel Co. of Canada, Ltd., to meet the C.P.R. requirements and specifications. The wheels and tires for C.P.R. locomotives have customarily been secured from England; for these Mikados, the wheels and tires were secured in the United States.

Of course, these locomotives are not the first built for the C.P.R. since the outbreak of war, in which have been employed materials other than those customarily used. When these 20 Mikado locomotives are delivered, they will bring to 89 the total number of locomotives added to C.P.R. equipment since the war broke out. Fifty-two of these were Pacific (4-6-2) type, numbered from 2366 to 2417 inclusive and built in 1940, 1942 and 1943, 12 were Mikado locomotives of the P2g class which were built in 1940 and which were all sent to the Algoma District, and the 12 locomotives of similar wheel arrangement, in the P2g class, is that the P2g locomotives are fitted with the conventional steam dome, whereas the locomotives now building have the dome omitted, and employ an internal steam collecting pipe, an arrangement which has been applied on certain preceding lots of C.P.R. locomotives.

In the boilers of the P2h class locomotives, the high tensile steel used in the first course is ¾ in. thick, while that used in the second and third courses is 27/32 in. thick. The firebox is equipped with a brick arch carried on four 3½ in. diam. arch tubes. An Elesco type K-40 feedwater heater is located on top of the smoke box. On the left side, the boiler is fed by an Elesco type CF-1 feedwater pump, located between the main and rear drivers. This pump is supported on a bracket attached to the main frame, and has capacity of about 80,000 lb. per hour. At the right side, the boiler is fed by a Hancock type 2-W-5000 inspirator. Three Okadee type FSD 1½ in. blow-off cocks are applied. One is located at the right front corner of the firebox, and is equipped with a sludge removing pipe extending across the throat sheets; one is located at the left back corner of the firebox, and is equipped with a sludge removing pipe extending across the boiler back head and the third is at the left side of the firebox.

R. B. Bowen,
Chief of Motive Power and Rolling Stock, C.P.R., responsible for the design of the Mikado locomotives described herein.

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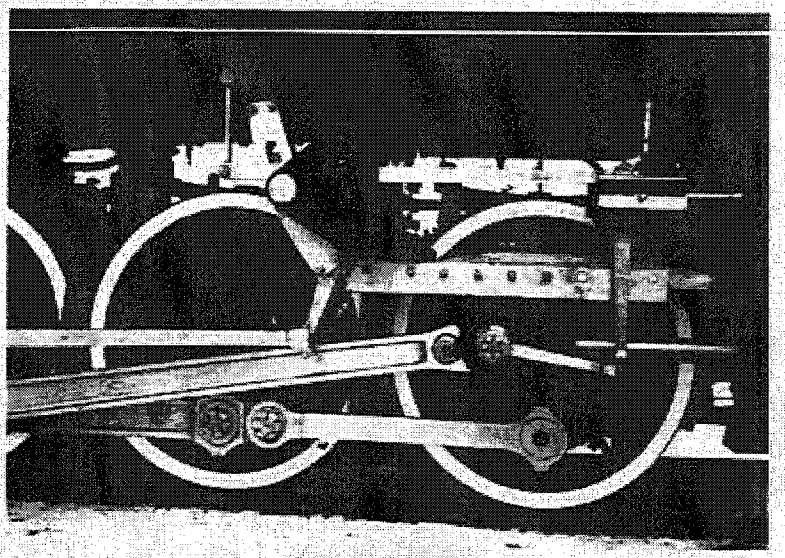
These locomotives are fitted with turrets for both superheated and saturated steam, both turrets being of McAvity manufacture. The superheated turret supplies steam for the steam engine, air compressor, water pump, whistle and blower, while saturated steam is supplied from the other turret for the inspirator, dynamo, steam heat, hydrostatic lubricator, force feed lubricator heater and automizers; and also to the auxiliary heater lines to feed pump, suction lines, inspirator, etc.



Right Front Motion Work of One of the New 2-8-2 Locomotives.

JUNE 1943

These locomotives are built with conventional frames, and with 3-point suspension spring rigging. They are fired by Standard Stoker Co. type H1 stoker and are equipped with the Superheater Co. multiple throttle. Laird crossheads are employed. The cylinders are of cast steel. The piston rings are of the Hunt-Spiller bronze lipped type, while the piston valves are equipped with plain cast iron snap rings. Steam distribution is governed by Walschaert valve gear. The piston valves are 12 in. in diameter and have 7 in. maximum travel. The valve setting provides for 1¼ in. lap, 3/16 in. lead and ⅛ in. exhaust clearance. The main and side rods are of the standard floating bushing type. Franklin driving box spreaders and lubricators are applied, while the Alco lateral motion device is applied to the front and front intermediate drivers. The main driving journals are 12 x 14 in., and the other driving journals 10½ x 14 in. The leading truck journals are 6 x 11 in., and the trailing truck journals 8 x 14 in. The leading truck wheels are 33 in. in diameter, and the trailing truck wheels 43 in. in diameter. Solid draw and safety bar connections are installed between locomotive and tender, as is also the Franklin type E1 radial buffer. The reverse gear is the C.P.R. standard screw type, with air motor drive.

The superheater is the Superheater Co. type A. Tender draft gear is the Cardwell type PF-6. TZ tank hose couplings are employed. Westinghouse Schedule L train signal equipment is installed. The bell ringer is the Taylorold type B. The steam gauge is of Sidney Smith make, and the air gauges are of Morrison make. The headlight is the Pyle National 14 in. submerged type, supplied with current from a Pyle National type E2 NC generator. Steam heat is controlled by a Leslie type AK reducing valve governing a 2 in. steam line.

The air brake schedule is the Westinghouse No. 8 ET. The Westinghouse No. 150-D 8½ in. cross-compound air compressor is mounted on the right side of the locomotive, between the main and rear drivers, and is bracketed to the main frame.

Lubrication is by a Nathan DV 4. Castings Corp. cast steel underframe. Coal capacity is 18 tons and water capacity 10,000 Imperial gall. The tenders are carried on four-wheel trucks with 36 in. diam. wheels, journals being 6½ x 12 in. Tender truck wheelbase is 6 ft. 1 in., and distance between truck centers is 20 ft. 3 in., tender wheelbase being 26 ft. 4 in.

Eighty-nine Wartime Locomotives

As stated in the foregoing, delivery of all 20 of these P2h locomotives will give the company a total of 89 units built since the outbreak of war in 1939, viz., 5 Royal Hudson, 52 Pacific and 32 Mikado type. The Pacific type locomotives were all built by Canadian Locomotive Co., Ltd., Kingston, Ont., which is building the 20 P2h Mikados; the five Royal Hudson Locomotives and 12 P2g Mikados were built by Montreal Locomotive Works. The 52 Pacific type locomotives are in two classifications; 12 of them, numbered from 2366 to 2377, all built in 1940, are in the G3f class; they were all sent to Western Lines, for Prairie freight service. The other 40 Pacific type locomotives are in the G3g class, and are numbered from 2378 to 2417 inclusive. The final delivery of this group, locomotives no. 2417, was made in February of this year. Of these locomotives, 12 were sent to Western Lines, while 27 were retained on Eastern Lines. All of these Pacific type locomotives have boiler pressure of 275 per sq. in. and develop maximum tractive effort of 45,250 lb. They have 22 x 32 in. cylinders and 73 in. driving wheels. While designed for fast freight work, they are very suitable for fast and heavy passenger service.

Metal Use—
Metal Scrap Price

Two orders to amend preceding regulations on use of metal and price of metal scrap were announced at the middle of May by Wartime Prices and Trade Board; one was issued by H. H. Foreman, Administrator of Fabricated Steel and Non-ferrous Metal, and the other by G. C. Bateman, Administrator of Non-ferrous Metals (Primary).

Order A-722, issued by Mr. Foreman, prohibits the use, except under permit of any metal other than gold or silver, for making highway, commercial, industrial and other signs. The manufacture of street and illuminated signs of metal has been prohibited for some time.

Order A-719, issued by Mr. Bateman, clarifies the price schedule of order A-699 on zinc scrap, by stipulating that 85c per 100 lb. may be added to the prices of six different classifications of zinc scrap if sold in slab form.

Re Handling of Circuses

As concerns rail movement of circus equipment in Canada, the Dominion Transport Controller has an understanding with the Canadian railways to the effect that no special trains are to be operated for any sport, amusement or exhibition purposes. Therefore, circuses having their own railway cars cannot obtain special locomotives for their movement, but there is no regulation or arrangement to prevent such circus cars from moving by ordinary freight.

Freight Car Situation

FOLLOWING are particulars of the freight car situation as at April 1, 1943:—

Canadian Lines—On Canadian National Rys. lines, 98,434 railway-owned and 3,800 privately-owned freight cars; 3,077 of the railway-owned cars, or 3.1% of total, awaiting or undergoing repairs. On Canadian Pacific Ry. lines, cars on the United States Class 1 railways were 1,707,444 railway-owned and 270,953 privately-owned; 44,263 of the railway-owned cars, or 2.6% of total, and 1,312 of the privately-owned cars, or 0.5% of total, were awaiting or undergoing repairs.

Particulars in regard to the bad order situation for the various classes

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ing type. Franklin driving box spreaders and lubricators are applied, while the Alco lateral motion device is applied to the front and front intermediate drivers. The main driving journals are 12 x 14 in., and the other driving journals 10½ x 14 in. The leading truck journals are 6 x 11 in., and the trailing truck journals 8 x 14 in. The leading truck wheels are 33 in. in diameter, and the trailing truck wheels 45 in. in diameter. Solid draw and safety bar connections are installed between locomotive and tender, as is also the Franklin type E1 radial buffer. The reverse gear is the C.P.R. standard screw type, with air motor drive.

The superheater is the Superheater Co. type A. Tender draft gear is the Cardwell type DF-6. TZ tank hose couplings are employed. Westinghouse Schedule L train signal equipment is installed. The bell ringer is the Taylor type B. The steam gauge is of Sidney Smith make, and the air gauges are of Morrison make. The headlight is the Pyle National 14 in. submerged type, supplied with current from a Pyle National type E2 NC generator. Steam heat is controlled by a Leslie type AK reducing valve governing a 2 in. steam line.

The air brake schedule is the Westinghouse No. 8 ET. The Westinghouse No. 150-D 8½ in. cross-compound air compressor is mounted on the right side of the locomotive, between the main and rear drivers, and is bracketed to the main frame.

Lubrication is by a Nathan DV 4 force-feed lubricator, supplying the cylinders, valves, water pump, stoker engine and guide bars. The cylinder and valve feeds are equipped with atomizers. The air compressor is lubricated by a Detroit size O single feed hydrostatic lubricator.

Equipment not mentioned in the foregoing includes SKF roller bearings at the bell trunnions; one McAvity flange lubricator for lubricating the flanges of the leading drivers; Nevercling sanders with sand supplied to the front of the second pair of drivers; McAvity back-pressure gauges; McAvity World B & C cab lamp; Ardco air-operated cylinder cocks, and Viloco air-operated whistle operator.

The tenders of these P2h locomotives are of rectangular type and riveted plate construction, with General Steel

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