STEAM LOCOMOTIVES BUILT IN CANADA FOR RUSSIA FRANCE AND INDIA.

CANADIAN BUILT LOCOMOTIVES FOR RUSSIA.

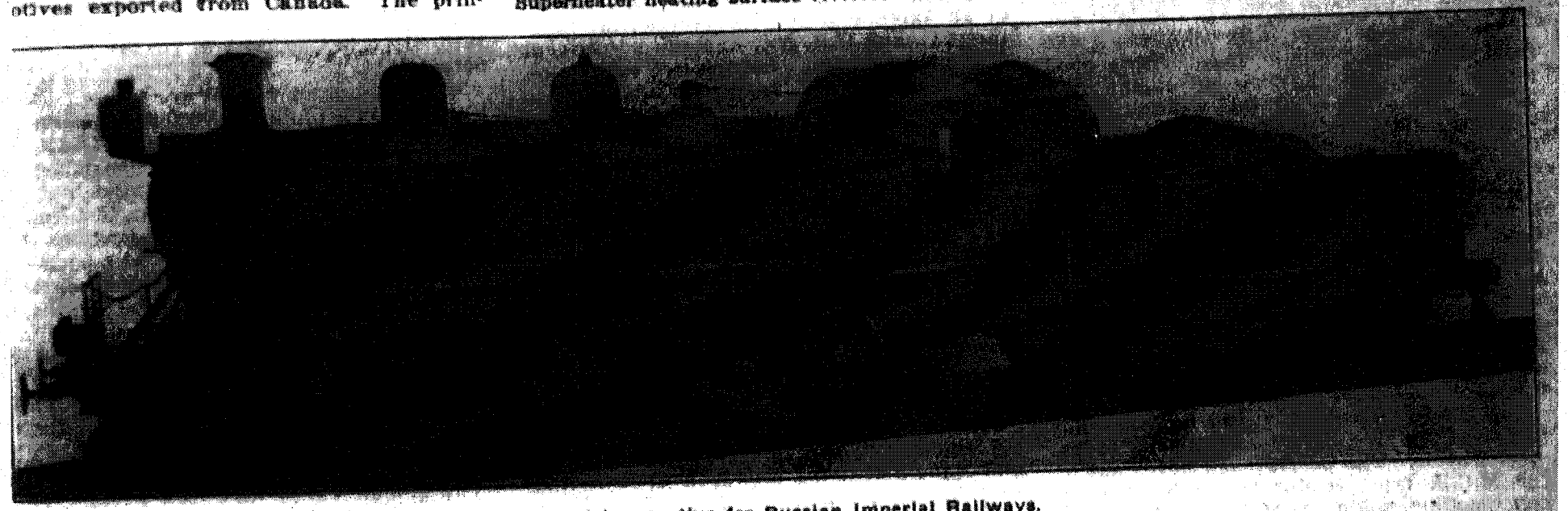
Canadian Built Locomotives for Russian Imperial Railways.

The Russian Imperial Railways are hav- 50 decapod type locomotives built by the nadian Locomotive Co. at Kingston, Ont., first lot of which have already been ipped. These locomotives are of interest, t only because of their design, which is a mbination of Russian and American prac- e, but because of their being the first loco- otives exported from Canada. The prin- ipal dimensions of the locomotives and enders are as follows:

Boiler	Straight
Working pressure	180 lbs. per sq. in.
Outside diameter of first ring	70 in.
Firebox, length and wirth	108¼ in. by 86 in.
Tubes, number and outside diameter	195-2 in.
Flues, number and outside diameter	28-5⅝ in.
Tube and flues, length	17 ft.
Heating surface, tubes and flues	2,393 sq. ft.
Heating surface, firebox (including arch tubes)	208 sq. ft.
Heating surface, total	2,601 sq. ft.
Superheater heating surface	563 sq. ft.
Equivalent heating surface*	3,446 sq. ft.
Grate area	64.5 sq. ft.
Tender tank	Water bottom
Tender frame	Channel
	36 in.
	5 ft.

ready-built by American locomotive builders.

The fuel used is a low grade of soft coal and is burned on a rocking four sectional grate with two dump bars. The firebox is of the wide type extending out and over the driving wheels, and is also equipped with a security brick arch supported on water tubes. The boiler is of the straight type, with a mud ring made up with cast steel ends, and forged steel sides welded together. An auxiliary safety valve dome is provided, which carries 2 safety valves and the whistle. This dome is also used as an inspection dome. A third safety valve is applied to the cover of the main steam dome.



Decapod Locomotive for Russian Imperial Railways.

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Decapod Locomotive for Russian Imperial Railways.

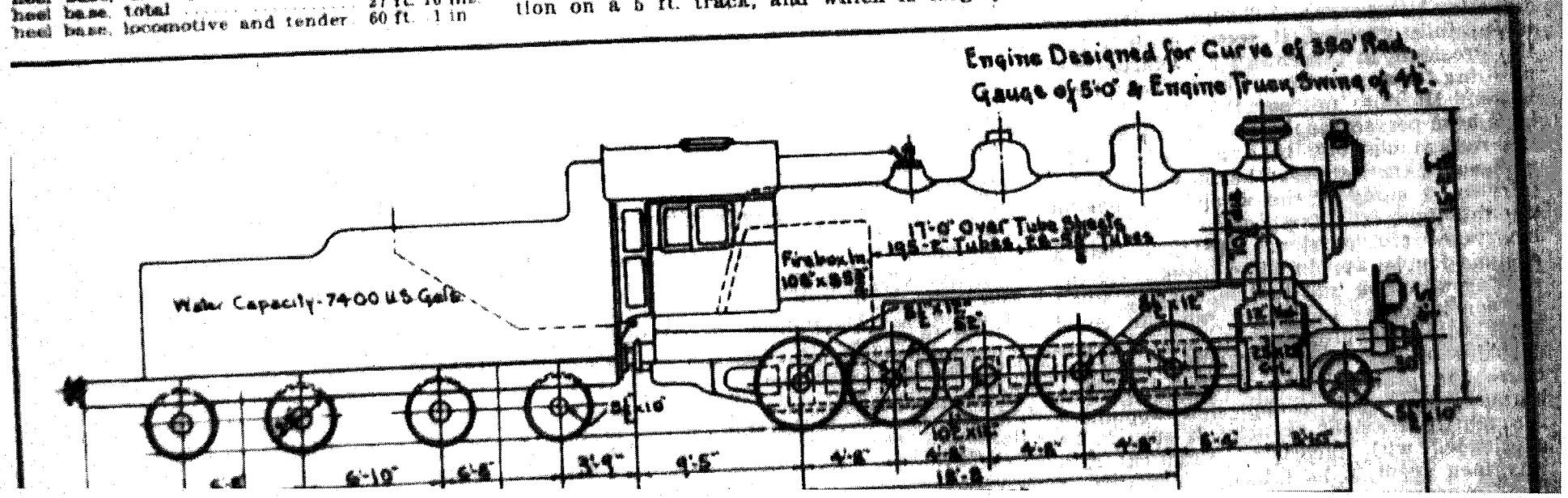
ıal dimensions of the locomotives and ıders are as follows:

ıage	5 ft.
rvice	Freight
el	Soft coal
active effort	51,500 lbs.
eight in working order	192,000 lbs.
eight on drivers	172,000 lbs.
eight on leading trucks	20,000 lbs.
eight on locomotive and tender in working order	122,000 lbs.
heel base, driving	18 ft. 8 ins.
heel base, total	27 ft. 10 ins.
heel base, locomotive and tender	60 ft. 1 in
Equivalent heating surface*	3,446 sq. ft.
Grate area	64.5 sq. ft.
Tender tank	Water bottom
Tender frame	Channel
Tender wheels, diameter	36 in.
Tender journals, diameter and length	5½ in. by 10 in.
Tender water capacity	7,400 gal.
Tender coal capacity	8 metric tons

*Equivalent heating surface equals total evaporative heating surface plus 1.5 times the superheating surface.

The locomotives are designed for operation on a 5 ft. track, and which is largely and the whistle. This dome is also used as an inspection dome. A third safety valve is applied to the cover of the main steam dome.

The firebox is of copper, as also are the staybolts used in the water legs. The front end of the firebox is supported by 3 rows of expansion stays, the nut on the upper end of the radial stay is seated in a die forged stirrup, which is screwed into the roof-sheet.



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Details of Decapod Locomotive for Russian Imperial Railways.

Ratio, weight on drivers, divided by tractive effort	3.34
Ratio, total weight, divided by tractive effort	3.73
Ratio, tractive effort x diam. drivers, divided by equivalent heating surface	7.80
Ratio, equivalent heating surface, divided by grate area	53.4
Cylinders	Simple
Diameter and stroke	25 in. by 28 in.
Valves	Piston
Diameter	12 in.
Wheels, driving, diameter over tires	52 in.
Wheels, driving journals, main, diameter and length	10½ in. by 12 in.
Wheels, driving journals, others, diameter and length	8½ in. by 13 in.

used as the standard gauge by the Russian railways. The axle loads are limited to 35,000 lbs. per axle, but engines are of considerable capacity, having a tractive effort of 51,500 lbs. (at 85% boiler pressure), they are designed to haul 1,000 metric tons up a grade 0.8% at a speed of about 10 miles an hour. Special material and equipment have been used to a great extent in these locomotives, and the construction is in accordance with the best American practice, many of the details are interchangeable with the locomotives of the same type and size al-

The locomotives are equipped with Schmidt superheater and outside steam pipes; superheaters have 28 elements with a superheater surface of 563 sq. ft. Forty nine are equipped with the Rushton power screw reverse gear, and the Casey-Cavin screw reverse gear is to be applied to the remaining one, both gears being operated by air.

The machinery, frames and cylinders are designed after American practice. The pistons are solid rolled steel with three cast iron packing rings sprung in, and are sup-

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Russian

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ported by an extension on the piston rod with a guide attached to the front cylinder head. The cylinder heads are of cast steel, single bar guides of I section being used. The main driving wheels have plain tires, while all the others are flanged, and the wheel base is such that the locomotive will traverse a curve of 350 ft. radius.

The locomotives are fitted with a wide running board of steel plate, diamond tread, having a handrail around the edges and continuing around the front deck plate in accordance with the Russian railway practice.

The cab is of steel, with side doors, the front end of tender is enclosed with a hood projecting under the cab of engine protecting the crew from the weather. The couplers are of the hook and screwed type of the European practice, as are also the spring buffers. Russian-Westinghouse automatic air brakes are used, along with the special design of the American Brake Co.'s foundation brake. A plug type of by-pass valve is fitted to the cylinder and operated by a cam attached to the throttle lever, which in turn opens a globe valve allowing steam to pass to a small cylinder closing the by-pass. When steam is shut off a tension spring operates the opening of the by-pass.

The tender is carried on two four wheeled trucks of the arch bar type with solid rolled steel wheels. The bearing and boxes are of the M.C.B. type, tender frame is of steel construction, made up of heavy 10 and 12 in. channels, with built up pressed steel bolsters.

After the locomotives have been erected and tested by running on a specially prepared track by the builders, the locomotives and tenders are dismantled, crated and packed for shipment to Vladivostock, Russia.

The United States Government and the

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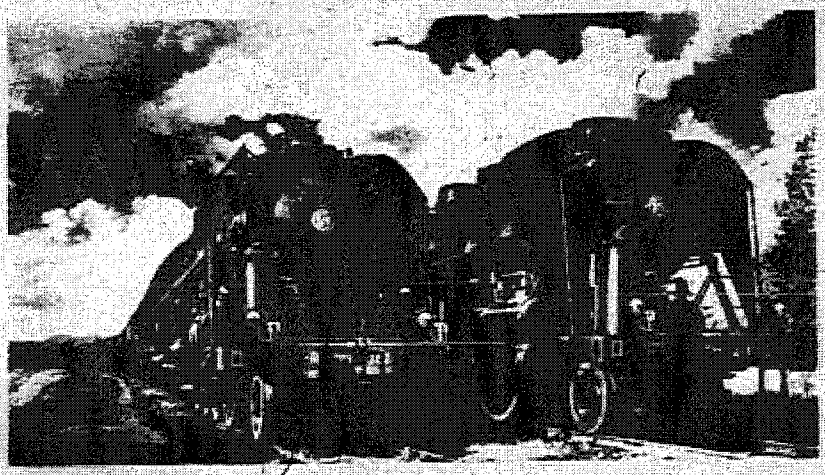
CANADIAN BUILT STEAM LOCOMOTIVES FOR FRANCE.

Canadian-built Locomotives for France

Illustrations herewith show locomotives of a type which Montreal Locomotive Works, Ltd., is building for the French National Railways. One hundred of them are being built. These locomotives, of standard gauge, are of the 2-8-2 type, with 65 in. driving wheels and cylinders of 23½ in. diameter and 28 in. stroke. The boiler is of 78 7/16 in. inside diameter and carries steam pressure of 220 lb. The firebox is 102¼ in. long and 78¼ in. wide. There are 36 flues of 5¾ in. diameter and 175 tubes of 2 in. diameter, length of tubes and flues being 17 ft. The driving wheelbase is 17 ft., locomotive wheelbase 35 ft. 8 in., and wheelbase of locomotive and tender 66 ft. 8 in. The weights in working order are:—On leading truck, 36,375 lb.; on drivers, 176,125 lb.; on trailing truck, 41,300 lb.; total locomotive, 253,800 lb.; tender, 160,000 lb.

The evaporating surfaces, in square



An Entire Train of Locomotives Built By Montreal Locomotive Works, Ltd., for French National Railways, Awaiting Removal to Ships for Transfer to Europe.

There are fourteen locomotives in the above illustration, the first consignment of an order for one hundred for the French National Railways.

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The evaporating surfaces, in square feet, are:—Tubes, 1,548; flues, 857; firebox, 231; syphons, 62; total, 2,698. The superheating surface is 704 sq. ft. The grate area is 55.5 sq. ft. The maximum tractive power developed is 44,500 lb., and factor of adhesion is 3.96.

The tender, of 8-wheel type, provides capacity for 8,000 U.S. gall. of water and 12 tons of coal.

The accompanying illustration of 14 locomotives is prepared from a photograph taken at the National Harbours Board siding in Montreal East.

Steel Frame Box Cars for the Russian Government.

ie Russian Government has placed rs recently for a large number of ght cars to be delivered on short notice. se include 2,000 steel framed, inside ithed 40 tons capacity box cars for n and general service, now being de- ed by the Eastern Car Company, New igow, N. S. As will be noted from the ompanying illustrations the type of con- ction embodies a design of outside al roof with runningboard and handrail chments to suit European practice. ilation is obtained by the use of a layer natched boards, placed longitudinally and ured to furrings which are bolted on top pressed steel carlines, which in turn are eted to the side plate Z-bar. The roof ets are applied in 20 sections per car of 24 galvanized steel having standing ms.

structural steel side framing is em- yed. The side posts and diagonal braces, h the exception of the inner diagonal ice at bolster, which is formed from a n Z-bar @ 8.4 lb. per ft., are all 3-in. Z- rs @ 6.7 lb. per ft. Side post and brace connections to 4-in. Z-bar @ 8.2 lb. side ite are made with pressed steel connec- on plates. The 7 x 3½ x 7-16-in. rolled eel angle iron side sill is so located as to mit of the side posts and braces being veted directly to same with three rivets each crossing. The side and end lining formed from 1¾ x 5¼ in. tongued and ooved boards, secured to each post by ght and to each brace by six button head olts with nuts placed outside, so as to give smooth interior. The top flange of the de plate Z-bar forms a sealed joint with ie lining and at the bottom, the lining is xtended to the lower edge of the flooring. [illegible] 2-16-in. corner angle secured to thick is secured over the flooring at the door opening. The flooring is formed by tongued and grooved boards 1¾-in. thick, bolted to the underframe members.

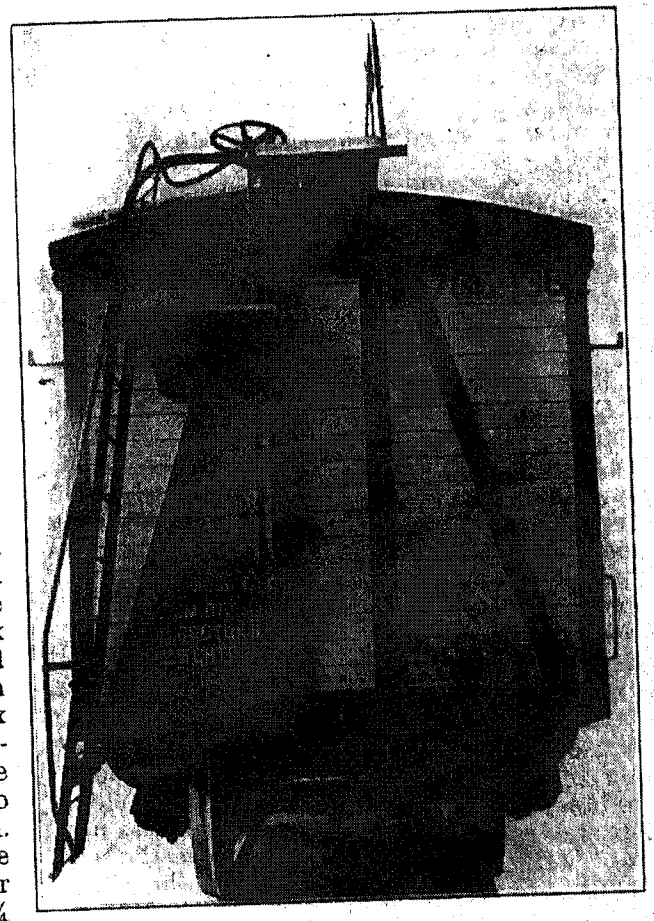
Pressed steel corner posts ¼-in. thick are provided in conjunction with 3-in. Z-bars @ 6.7 lb. for centre end posts and diagonal braces. The usual type of brake mast application, as used for cars operating on this continent, is followed, and a pressed steel platform and brace is included.

Hook type, drop forged couplings are used in conjunction with springs and cast follower cups, the stem of the coupling is extended and threaded, so as to accommodate one hexagon nut and a flat split key placed immediately behind the rear follower. The European type of disc buffer, 17 23-32-in. diameter, is used, same being bolted directly to the end sill.

The design of the underframe presents an unusual precedure, in that truss rods 2-in. in diameter, located 13⅝-in. off centre, are employed in conjunction with an all metal underframe and steel side frame. The centre sills are 10-in. @ 21.8 lb. per foot rolled steel channels, placed 12⅞-in. apart back to back, a full length top cover plate 20-in. by ⅜-in. is provided, also a 4 x 3½ x ½-in. x 33¼ ft. rolled steel angle is riveted to the lower portion of the web of each centre sill. Bolsters are formed with 16 x ⅜-in. cover plates, the top one only extending from side sill to side sill, the lower one just includes side bearing, all secured to pressed steel diaphragms flanged all around. Cast centre plate fillers between centre sills form a tie between the two bolster diaphragms. Two crossbearers placed 12¼ ft. apart centre to centre, provided with same design of diaphragms as bolster, and top and bottom cover plates 6 x ⅜-in., form [illegible] rod struts, which are 23¼-

steel piping. All safety appliances are arranged to come within the clearance gauge of the German and Austrian Railways.

An arch-bar type of truck is employed in conjunction with axles having journals for 100,000 lbs. capacity cars, in spite of the fact that the cars are only built for 80,000 lbs. loading. The side frames are formed by top and bottom bars 5 x 1¼-in. steel and



End View of Steel Frame Box Car for Russian Government.

tie bar 5 x ⅝-in. steel. Centre plates are of [illegible] body section bolted, truck

s with nuts placed [illegible]
nooth interior. The top flange of the
plate Z-bar forms a sealed joint with
lining and at the bottom, the lining is
nded to the lower edge of the flooring.
½ x 2 x 3-16-in. corner angle secured to
bottom board of the lining with button
d bolts and having the wide flange rest-
on the top of the floor forms a grain
t joint all around the base of the car.
side doors are 6-ft. 5⅝-in. wide formed
h a frame 2¼-in. thick, having two
tre rails reinforced by ⅛-in. pressed
el braces. The corners of the door are

sills form a tie between
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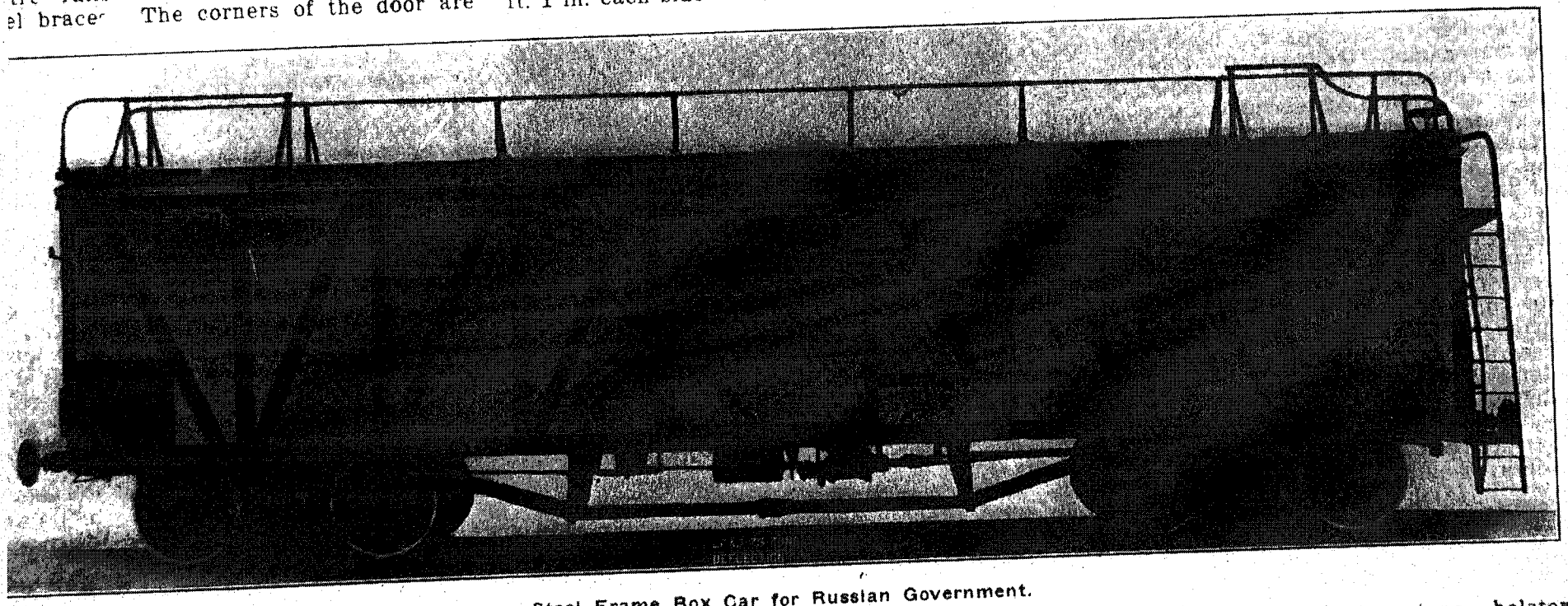
ft. apart centre to centre, provided with
same design of diaphragms as bolster, and
top and bottom cover plates 6 x ⅜-in., form
support for truss rod struts, which are 23¼-
in. deep. Floor supports of pressed steel
4¼-in. deep are located as follows: one be-
tween bolster and crossbearer and one be-
tween crossbearers at centre of car. Longi-
tudinal floor stringers of 3-in. Z-bars @ 6.7
lb. per ft, run full length of car, located 3
ft. 1 in. each side from centre of car. Press-

End View of Steel Frame Box Car for Russian Government.

tie bar 5 x ⅝-in. steel. Centre plates are of malleable iron, body section bolted, truck section riveted to truck bolster, latter being formed by two 10in. I-beams @ 25 lb. per ft. and fitted with 13-in. x ⅜-in. top and bottom cover plates. Roller type side bearings located 2½ft. off centre and arranged for ⅜-in. clearance, are employed in con-



Steel Frame Box Car for Russian Government.

trengthened by angle plates; the top and
ottom combination guide and stiffener
trips, which are Z-shaped, are bolted to
he door frame and engage three malleable
ron bottom guides when the door is closed.
oor hangers operate on an enclosed track
s shown by the illustration. Grain doors
f the removable type are provided and the
usual type of steel threshold plate ⅛-in.

ed steel diagonal braces, transmitting
thrust from end sill buffer to centre sill are
formed, so as to tie the bottom and centre
sill construction together, as well as giving
stiffness to the pressed steel end sill, which
has a flange 12-in. wide lapping over the
centre and side sill construction.

The ladder stiles are formed from angles
with round iron treads; hand rails are of

junction with four-cluster type bolster
springs located 6 ft. 8 5-32-in. centre to
centre. Offset style of brake rigging is ar-
ranged to provide a distance of 15-in. from
rail to centre of brake head. Column cast-
ings are designed with brake hanger lugs
cast integral. Clearance between top of
bolster and underside of top arch bar is
maintained at ⅜-in. centre pins, 2-in.

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diameter, and fitted with top and bottom keys with cover provided inside of car to admit of their removal. Spring planks are formed from 13-in. channels @ 32 lb. per ft.

The following are the general dimensions:

Gauge.	5 ft.
Length over buffers (free)	46 ft. 10⅜ in.
Length over pulling face of couplers,	44 ft. 5¼ in.
Length over end sills	42 ft. 11½ in.
Width over side sills	9 ft. 1 in.
Width over side plates	9 ft. 1½ in.
Width inside	8 ft. 10 in.
Width of door opening	6 ft.
Height top of rail to top of side plates	11 ft. 6⅞ in.
Height top of rail to top of floor	4 ft. ⅞ in.
Height top of rail to bearing face of centre plate	2 ft. 8¼ in.
Height top of rail over runningboard	12 ft. 10 ⅜ in.
Height top of rail over runningboard hand rail	15 ft. 3 in.
Height top of rail over brake mast	13 ft. 5⅜ in.
Height top of rail to centre of buffer	3 ft. 5¾ in.
Height inside at centre (clear)	8 ft. 2 in.
Height of side door opening	7 ft. 1¾ in.
Centre to centre of lamp brackets	10 ft. 2 1-16 in.
Centre to centre of trucks	30 ft. 9 in.
Centre to centre of buffers	5 ft. 10⅛ in.
Truck wheelbase	6 ft. 3 in.
Total wheelbase of car	37 ft.
Capacity of car	80,000 lbs.
Capacity of axles (each)—38,000 lb. (Size of journal 5½ in. by 10 in. M.C.B. std.)	
Diameter of wheels—41⅜ in. (M.C.B. std. cast iron chilled tread and flange).	
Weight of wheels (each)	1,025 lb.

The cars are being shipped knocked down, the underframe all in one piece, with floor laid, and are routed via the Panama Canal to Vladivostok, where they will be assembled. The first vessel with 175 cars left Sept. 7.

Death of Harry Braithwaite Abbott at Vancouver.

Harry Braithwaite Abbott, M. Can. Soc. C.E., who died at Vancouver, B.C., Sept. 14, of pneumonia after only a few days illness, [illegible] Mr. Justice Sicotte, and widow of C. Freer, who predeceased him by a number of years.

Mr. Abbott was one of the earliest residents of Vancouver, and as the chief C.P.R. conditions the manners of the old wor that so well became him, and to the end his long career retained the respect a honor of all. In the social directions which he was interested, apart from l business affairs, he assumed with the qu modesty which distinguished him, a r that gave those movements a stability a an influence which they would not oth wise have possessed."

October 1915

Location of Emergency Valve on Passe ger Cars.

G. Spencer, Chief Operating Officer, Bo of Railway Commissioners, sent the foll ing memorandum to the Secretary of Board, Sept. 15:—

Re Mr. Barry's letter of May 5 bringing the question of having the conductor's va or emergency valve placed in a promin position and stencilled or otherwise indi ed, so that in the event of an accident emergency case cropping up any persor the car might operate the valve and stop train. This case was considered and he

CANADIAN BUILT STEAM-LOCOMOTIVES FOR INDIA.

Canadian Transportation

Locomotives for Indian State Railways

The 145 Mikado locomotives of 5 ft. 6 in. gauge, being constructed by Canadian builders for the Indian State Railways, have 21 x 28 in. cylinders, weight on drivers 141,000 lb. and 60 in. drivers, and, with 200 lb. boiler pressure, develop maximum tractive effort of 35,000 lb.

A PRELIMINARY reference to the 145 Mikado locomotives of 5 ft. 6 in. gauge, which are being built in Canada for the Indian State Railways, 75 by Canadian Locomotive Co. and 70 by Montreal Locomotive Works, appeared in Canadian Transportation for December last. These locomotives, the first to be built in Canada for export to India, were designed by Canadian Locomotive Co. and Montreal Locomotive Works, in conjunction with the engineers representing the Indian State Railways, so that they will be satisfactory for service on the important parts of the Indian State Ry. system. Canadian standards of material and workmanship are being adhered to throughout. The Mechanical Department of the Canadian Pacific Ry. Co. was engaged to perform the very important work of inspection of materials and workmanship entering into construction of these locomotives, and has a substantial staff engaged in the inspection of the work during the complete progress of locomotive construction.

A right side elevation of one of the Indian State Railways locomotives accompanies this article. Length over buffers, locomotive and tender, is 69 ft. 0⅝ in., while total wheelbase of locomotive and tender is 59 ft. 4 in. The locomotive wheelbase is 32 ft. 9 in., and driving wheelbase is 15 ft. 9 in. Tender wheelbase is 17 ft. The leading truck wheels are 30 in. in diameter, with 6½ x 11 in. journals. The driving wheels are 60 in. in diameter, and all driving journals, except the main ones, are 8 x 11 in., the main drivers having 9 x 11 in. journals. The trailing truck wheels are 42 in. in diameter and the journals are 7½ x 12 in. The tender wheels are 36 in. diameter, and tender journals are all 5½ x 10 in. Tender trucks wheelbase is 5 ft. 8 in., and the distance between the rear axle of the leading truck and the front axle of the trailing truck, center to center, is also

February 1944

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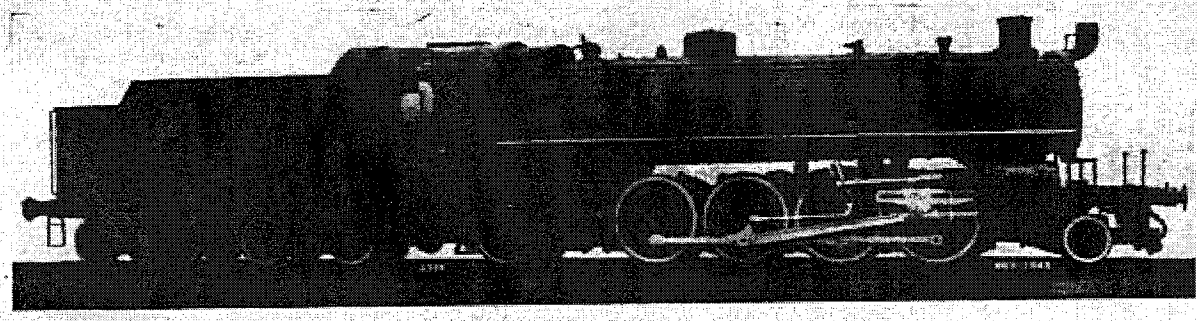
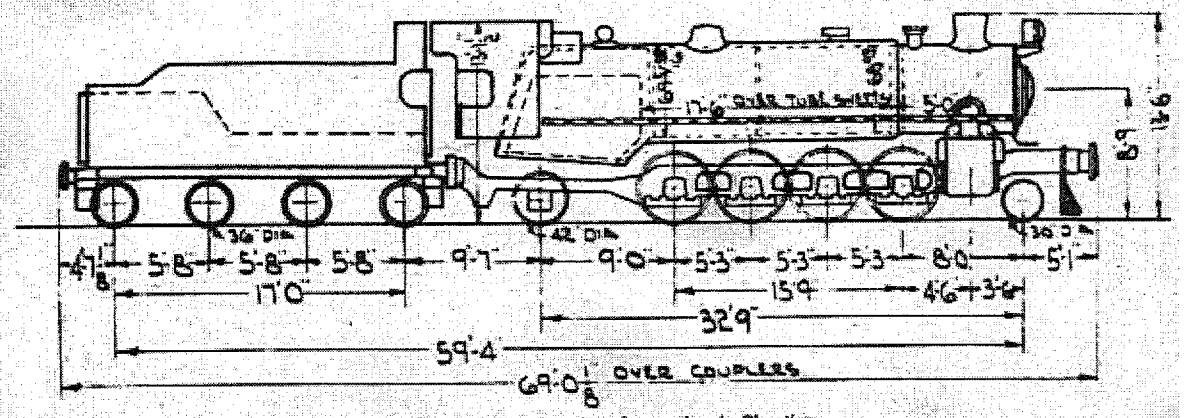


One of the 5 ft. 6 in. Gauge Locomotives Being Built in Canada for Indian State Rys.

Montreal Locomotive Works is building 78 locomotives of this type, and Canadian Locomotive Co., 72, and delivery of all is scheduled to be completed within a few months.



One of the Indian State Rys. Locomotives in Elevation.

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5 ft. 8 in. The approximate weight distribution is as follows:—On leading truck, 20,700 lb.; on leading drivers, 34,900 lb.; on second pair of drivers, 34,900 lb.; on main drivers, 36,000 lb.; on rear drivers, 35,200 lb.; on trailing truck, 36,300 lb. Total weight on drivers is 141,000 lb.; total weight of locomotive in working order is 198,000 lb., light weight being 176,900 lb. Light weight of tender is 48,500 lb., and weight of tender in working order is 123,750 lb. The boilers of these locomotives carry steam pressure of 200 lb. per sq. in., and, with cylinders 21 in. diameter by 28 in. stroke, the locomotives will develop maximum tractive effort of 35,000 lb. The firebox inside length is 102⅛ in. and width 66¼ in., and grate area is 47 sq. ft. There are 137 2 in. tubes and 30 5⅜ in. flues, distance over tube sheets being 17 ft. 6 in. Heating surfaces are as follows:—Tubes and flues, 1,985 sq. ft.; firebox, 162 sq. ft.; arch tubes, 17 sq. ft.; total fire heating surface, 2,164 sq. ft.; superheating surface, 623 sq. ft. The tenders will have capacity for 4,500 Imperial gall. of water and 13 tons of coal.

Factor of adhesion for these locomotives is 4.02.

The boilers of these locomotives are of the straight top radial type, built in two courses; the diameter at the front tube sheet outside is 68 in. and the length over tube sheet is 17 ft. 6 in. The firebox is 66¼ in. wide and 102⅛ in. long. The material in the first and second courses is 21/32 in. thick, other thicknesses being:—Roof and sides, 9/16 in.; back head, ½ in.; outside throat, 11/16 in.; front tube sheet, ⅝ in.; crown and side sheets, ⅝ in.; firebox door sheet, ⅝ in.; back tube sheet, ½ in. There are 137 2 in. tubes, 30 5⅜ in. flues and three 3 in. arch tubes. As above stated, the total fire heating surface is 2,164 sq. ft. The superheater applied is the Superheater Co. Type A. A swing type standard fire door is applied.

Frames and Running Gear—The frames of these locomotives are of

Front End View of One of the "X-Dominion" Locomotives for India.

built-up construction, employing cast steel in the side frames and cross ties. The cylinders, which, as stated, are of 21 in. diameter and 28 in. stroke, are of cast iron. The valve gear is of the Walschaert type, and the piston valves are 10 in. diameter, with 6½ in. valve travel. The leading and trailing truck and tender truck boxes are fitted with Hennessy lubricators, while the driving boxes are fitted with Franklin grease cellars.

Brakes—A steam brake is installed, to apply on the drivers and tender wheels only; for braking the train, an automatic vacuum brake is fitted, the locomotive being fitted with a coupling at the front and one at the rear of the tender. The equipment includes the Gresham and Craven ejector and the same firm's steam brake valve, this equipment having been furnished from Great Britain.

Lubrication—Each locomotive is fitted with a Detroit five-pint minimum capacity lubricator, with four feeds, two to the valve chests and two to the cylinders.

The ashpan is fitted with a special flushing pipe of Indian State Rys. design, and the grates are of the hand-operated rock-finger type to Indian State Rys. design.

The driving wheel centers are arranged for future application of standard riveted-on driving tires by Indian State Rys.

The cab is specially designed for use in the tropics, with the roof lined in maple, leaving an insulated air space. A canopy is applied over the firing deck on the tender.

Spares—With each locomotive, spare parts are being shipped, and an additional maintenance scale of spares is being shipped with every 20 locomotives.

Specialties—For these locomotives, three-piece type flexible staybolts, with screwed caps and welded taper sleeves, have been furnishd by American Locomotive Co. There are two 2-in. flange type blow-off cocks, one applied at the throat and one on the boiler barrel, these being supplied by Everlasting Valve Co. The safety valves are of Manning, Maxwell and Moore manufacture. The injector, injector top check and injector steam valve are supplied by Nathan Mfg. Co. The piston packing rings, of combination iron and brass sectional type, are supplied by Hunt-Spiller Mfg. Corp. The metallic packing rings for the piston rods and valve stems are of Paxton-Mitchell manufacture.

Other equipment includes Alemite grease fittings; Prime Mfg. Co. clear vision window; Pyle-National 14 in. focusing type headlight with dimming arrangement and Pyle-National cab lamps; Nathan Mfg. Co. prismatic type Klinger water gauges; Nathan Mfg. Co. whistle; James Morrison steam gauges; General Steel Castings Corp. one-piece cast steel tender frame; American Locomotive Co. tires and springs; Johns-Manville boiler lagging; Barco flexible joints; Franklin Railway Supply Co. radial buffer.

Delivery Progress—To Jan. 18, Montreal Locomotive Works had shipped 23

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and grate area is 47 sq. ft. There are 137 2 in. tubes and 30 5⅝ in. flues, distance over tube sheets being 17 ft. 6 in. Heating surfaces are as follows:—Tubes and flues, 1,985 sq. ft.; firebox, 162 sq. ft.; arch tubes, 17 sq. ft.; total fire heating surface, 2,164 sq. ft.; superheating surface, 623 sq. ft. The tenders will have capacity for 4,500 Imperial gall. of water and 13 tons of coal.

Factor of adhesion for these locomotives is 4.02.

The boilers of these locomotives are of the straight top radial type, built in two courses; the diameter at the front tube sheet outside is 68 in. and the length over tube sheet is 17 ft. 6 in. The firebox is 66¼ in. wide and 102⅛ in. long. The material in the first and second courses is 21/32 in. thick, other thicknesses being:—Roof and sides, 9/16 in.; back head, ½ in.; outside throat, 11/16 in.; front tube sheet, ⅝ in.; crown and side sheets, ⅜ in.; firebox door sheet, ⅜ in.; back tube sheet, ½ in. There are 137 2 in. tubes, 30 5⅝ in. flues and three 3 in. arch tubes. As above stated, the total fire heating surface is 2,164 sq. ft. The superheater applied is the Superheater Co. Type A. A swing type standard fire door is applied.

Frames and Running Gear—The frames of these locomotives are of

Front End View of One of the "I-Dominion" Locomotives for India.

built-up construction, employing cast steel in the side frames and cross ties. The cylinders, which, as stated, are of 21 in. diameter and 28 in. stroke, are of cast iron. The valve gear is of the Walschaert type, and the piston valves are 10 in. diameter, with 6½ in. valve travel. The leading and trailing truck and tender truck boxes are fitted with Hennessy lubricators, while the driving boxes are fitted with Franklin grease cellars.

Brakes—A steam brake is installed, to apply on the drivers and tender wheels only; for braking the train, an automatic vacuum brake is fitted, the locomotive being fitted with a coupling at the front and one at the rear of the tender. The equipment includes the Gresham and Craven ejector and the same firm's steam brake valve, this equipment having been furnished from Great Britain.

Lubrication—Each locomotive is fitted with a Detroit five-pint minimum capacity lubricator, with four feeds, two to the valve chests and two to the cylinders.

Specialties—For these locomotives, three-piece type flexible staybolts, with screwed caps and welded taper sleeves, have been furnishd by American Locomotive Co. There are two 2-in. flange type blow-off cocks, one applied at the throat and one on the boiler barrel, these being supplied by Everlasting Valve Co. The safety valves are of Manning, Maxwell and Moore manufacture. The injector, injector top check and injector steam valve are supplied by Nathan Mfg. Co. The piston packing rings, of combination iron and brass sectional type, are supplied by Hunt-Spiller Mfg. Corp. The metallic packing rings for the piston rods and valve stems are of Paxton-Mitchell manufacture.

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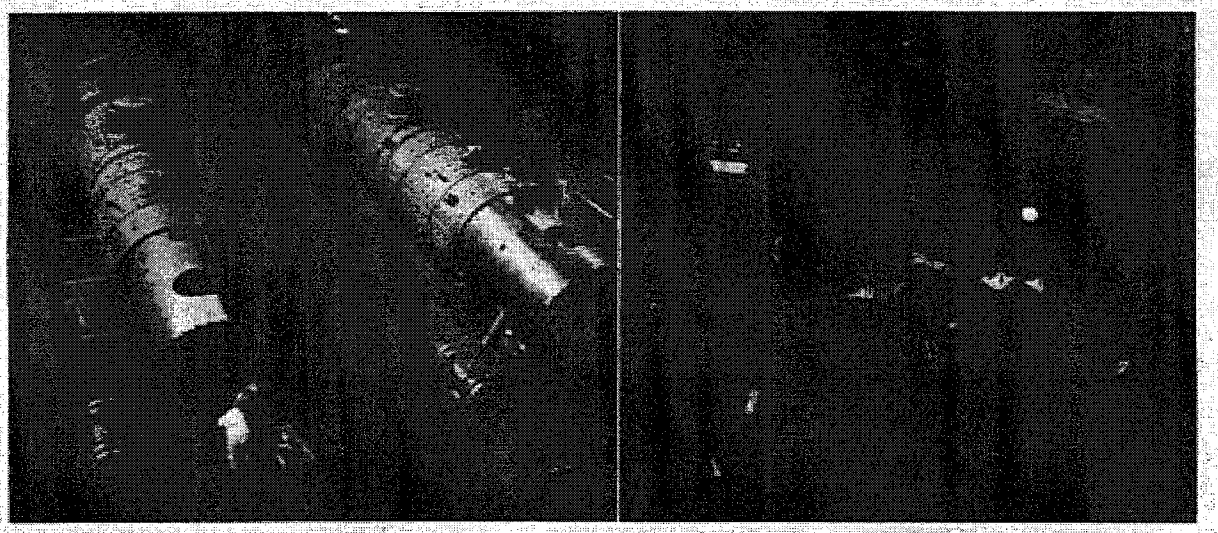
Delivery Progress—To Jan. 18, Montreal Locomotive Works had shipped 23



Left, Two of the 145 Locomotives in the Lot for Export to India Begin to Take Shape. Right, Placing the Driving Wheels in Position.

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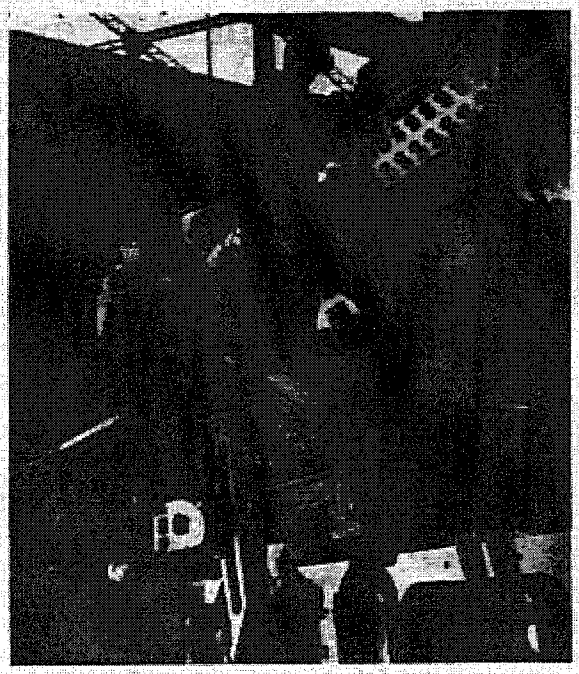
locomotives on its contract, and the expectation was that between 25 and 30 would be completed by the end of January. Canadian Locomotive Co. had shipped 26 locomotives to the end of 1943, and advice at mid-January was that the expectation is to deliver the balance at the rate of about 12 a month, which would enable Canadian Locomotive Co. to complete its quota about May.

These locomotives were ordered to meet the demand for efficient rail transportation of troops and equipment to such war fronts as the Burma Frontier. It is pointed out that the armies of the United Nations must be serviced by rail transportation which is as modern and efficient as the equipment with which the soldiers fight, and, to meet the requirements, the locomotives are being produced in the shops of the two Canadian builders with the same urgency as other vital war stores. They are being exported to India by Canada along with the other military equipment, munitions and food, which are being provided direct by Canada to the other United Nations in the prosecution of the war.

A thoroughly varied list of material that comes from all parts of Canada enters into the construction of these locomotives. Consequently, Canadian foundries and machine shops across the country have contributed many man hours of effort in the manufacture of components or material to complete this project. It is difficult to name a military vehicle or product being made in Canada today that equals the locomotive when considering the diversification of materials that go into its construction. It is expected that the high quality of material and workmanship evident in these locomotives will encourage the Indian Railways to look upon Canada as one of their important sources of supply for railway rolling stock and railroad equipment in the years of peace following the war.



Working on the Exterior of the Boiler of One of the 145 Locomotives for India.

National Film Board Photo.

Railway Revenue Freight Traffic

The Dominion Bureau of Statistics, Transportation and Public Utilities Branch, reports that loadings of revenue freight on Canadian railways in December last were approximately 8,-473,000 tons, and that cars loaded with

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