OSHAWA ELECTRIC

Electric Railway Department

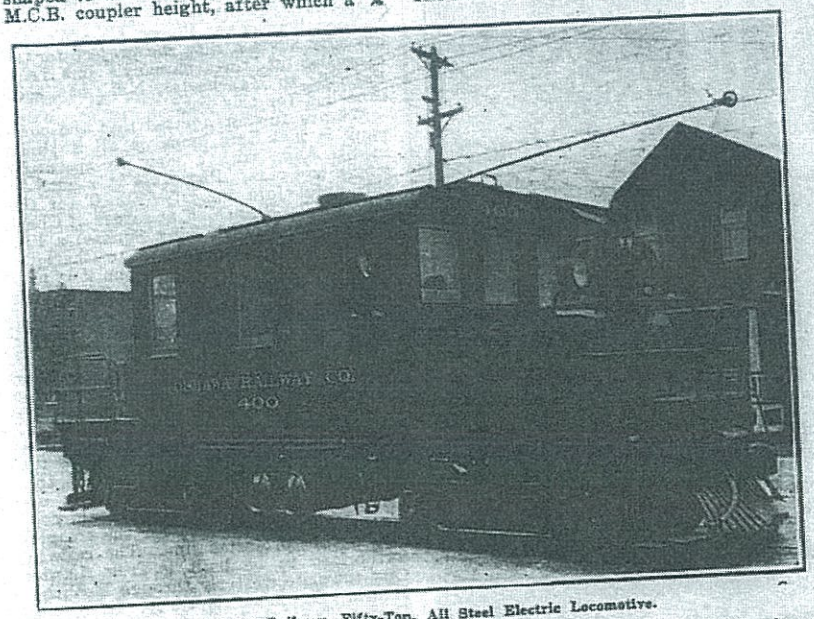
Oshawa Railway Fifty-ton Electric Locomotive.

The Oshawa Ry., Oshawa, Ont., has added a 50-ton 400 horse power, steel, electric locomotive, which it has had built by Ottawa Car Manufacturing Co. The following are the principal dimensions:—

Length over end sills	32 ft.
Length of cab	16 ft.
Distance between bolster centers	13 ft.
Width over cab	10 ft.
Height, top of rail to top of roof	12 ft.
Height top of rail to center of draw bar	34½ ft.

The underframe is of steel construction, built as one unit. There are 6 longitudinal sills consisting of four 12 in. I beams and two 12 in. channels, with cross sill of 9 in. I beams and corner angle 6 x 6 x ½ in. Bumpers, or end sills, are built up with a 12 in. channel, fastened to ends of longitudinal sills by 6 x 6 x ½ in. angles, with another 12 in. channel shaped to meet the requirements of the M.C.B. coupler height, after which a ¾ in. steel plate is sheared to meet the required shape, and securely rivetted together. Bolsters are of box girder type constructed with two 12 in. channels and 1½ x 15 in. steel plate on the bottom side, rivetted to flanges of the 12 in. channels. A ½ in. rolled steel floor plate extends the full length of the locomotive and the full width of cab. This construction forms a strong girder of the box type.

The cab, or body, is of steel construction, consisting of angle irons for ends and Z bars intermediates, 6 in all, bent to form the sides and roof in one continuous piece, to which 3/16 in. sheet steel plates are rivetted, forming window and door openings. The roof is of steeple type, having 3 windows in each side and 2 on ends, with door at each diagonal corner. Two windows on each side are drop, and the third, which is at the control corner of the cab, is of a sliding type, with hinged arm rest, to enable the locomotive men to look out with ease when shunting. A storm sash is placed on the end window opposite the locomotive man. An 18 in. globe ventilator is placed at the center of roof, to take away any heat generated by the resistors. All sash and doors are of white ash, with ⅞ in. white ash t. and g. sheeting on the interior. A frame is built of angle iron, surrounded with movable expanded metal screens, for the purpose of mounting the control equipment, which is located in the center of the cab. The resistors, which are installed in the top half, near the roof, are surrounded by 4 sheet metal doors, with ends of permanent sheet steel panels rivetted to frame. The floors are of wood, with air space of 1½ in. between the 1½ steel plate and bottom side of floor boards, which are 1½ in. thick, t. and g., covered over with steel checker plate. The hoods or sloping ends are of 3/16 in. steel plates rivetted to angle irons. Doors are placed on end to permit installing new carbons and oiling air compressors. Also on side of hoods there is a double door, to permit installation of equipment, and the same are constructed to prevent undue heating of the electrical apparatus, which they contain, including the fan motor. There is also a door into the cab, so as to give the locomotive man easy access from inside of cab without going outside. These side doors are arranged to keep out water and give abundance of ventilation. An upholstered seat, with arm rest, is provided at each operator's position.



Oshawa Railway, Fifty-Ton, All Steel Electric Locomotive.

Pilot and switchman's steps are provided at each end. The pilot is constructed of angle iron base, with 1½ in. iron pipe for uprights, conforming to shape to meet the requirements of the locomotive end and coupler. A 1¼ in. pipe rail is located on each end, to ensure safety, with an 18 in. opening at center, to give access to switchmen and train men, also train line jumpers. This railing is 3 ft. high with center rail, one end secured to hoods, and the opposite end forms a grab handle on the side, where angle iron steps are provided, with another grab handle fastened to cab corner post, providing access to inside of cab. A hand brake is provided with a 15 in. drop handle. Marker lamps and sockets of standard railway type are provided with flags. Sand boxes are located in each hood and designed to carry a quarter ton of sand, with 2 O.B. type air sanders in each box. The corner wheels have an independent discharge pipe of 1¼ in., which is attached to the truck connected with rubber hose to each air sander. A standard air operated locomotive bell is provided at one end, mounted on hoods. This bell is also hand operated by a cable running through a ½ in. pipe and pulleys, which makes a very easy hand ringing apparatus. The headlights, which are located on each hood, are of the Golden Glow type 12 in., 94 watts, 115 volts, plain resistance, with mirror reflector. Trolley retrievers are of the O. B. type on each end, mounted on hoods. The couplers have been designed specially to meet the requirements of the underframe and trucks. A very heavy bumper pocket casting, rivetted to center I beams, contains the Westinghouse friction draft gear. This arrangement eliminates any buffing shocks, which the locomotive would get if provided with the solid coupler head, therefore, is an important factor when one takes into consideration the Westinghouse h.l. control, which is installed inside the cab, giving longer life and better service, also eliminating unnecessary adjustments, which would occure without the use of the Westinghouse friction draft gear. Coupler heads are the M.C.B. standard. Poling sockets are provided at each corner, complying with the M.C.B. standard design. Air signal is installed, to meet future requirements for passenger service.

The trucks are the Baldwin-Westinghouse standard electric locomotive truck, with rigid bolster, equalized type, designed especially for locomotive service, and built with rolled steel side frames located outside of wheels. The cast steel transom and rolled steel end frames are fitted together with reamed taper bolts. This construction is especially adapted to heavy traction and buffing strains met in locomotive service. Wheels are rolled steel, 36 in. diameter with 4 in. tread, 1⅛ in. flange. Axles are forged steel, to meet requirements of A.E.R.A. standard in diameter and bearing area; 6½ in. diameter at bearing and 7 in. at gear. Journal boxes are of semi-steel of the Symington type journals, 5 x 9 in. The brake rigging is actuated through a radial brake beam, and through a brake beam located adjacent to truck transom. This permits the locomotive to negotiate short radius curves.

The electrical equipment comprises the Westinghouse type h.l. unit switch control, double end, arranged for field control of motors, including forced ventilation to motors and train line receptacles. The type of motor is 562-D-5 of 100 h.p., 600 volts, making a total of 400 h.p. per locomotive. The gears are Nuttall helical. A smooth drive, which is free from

JULY 1920

vibration, exists on helical gear equipped locomotives.

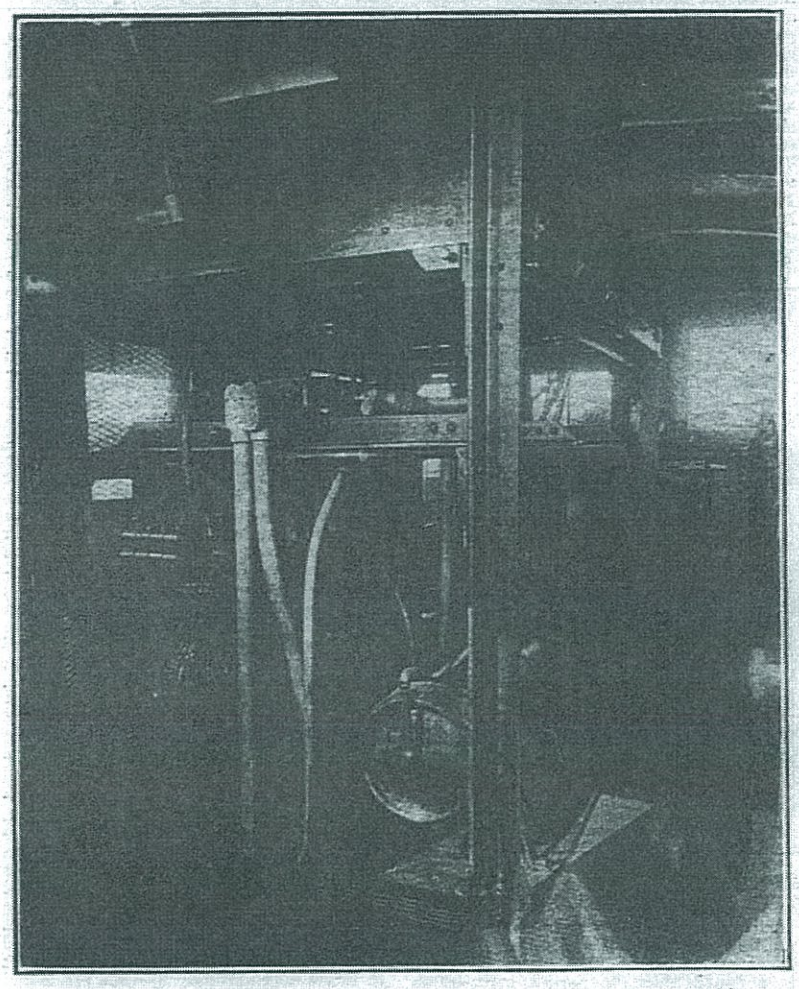
Air brakes are the Westinghouse Traction Brake Co.'s make, 14-E.L., arranged for double end operation, including two compressors, type D-3-E.G., also governor synchronizing system, which ensures uniform compressor labor. Without this, the life of a compressor overloaded is considerably shortened, and the running and maintenance expense must be correspondingly high. Through the operation of this system, the two compressors must start and stop simultaneously. A clarion type of whistle is installed over end corner window, operated by air.

Marker lamp brackets are installed on each corner for holding signal flags. The locomotive is equipped with 2 marker lamps, and 2 classification lamps, including 4 green and 2 red flags.

The heater equipment consists of 2 sets of 4 heaters per set, Consolidated Heater Co. make, including 2-knife switch and fuse.

The painting is a dead black, varnished, with lettering in gold leaf, which is a very suitable color for this type of locomotive.

Reliability was the most important factor considered in designing this locomotive, also five essential features were considered: (1) The weight, type, capacity and mechanical design should be suitable for the service requirements; (2) the motive power apparatus; (3) the apparatus on the locomotive should be mounted in such a way that each part would be permitted to operate to the best advantage, with the chance of trouble reduced to a minimum; (4) all apparatus should be accessible for inspection, maintenance and overhauling; (5) there should be no danger of the operator being thrown in contact with the live parts. Centralization of control equipment is very important and one arrangement of this is shown. This has a number of advantages: (1) All control apparatus is assembled compactly in one part of the locomotive and the switch groups are located in such a manner that they are readily accessible from all sides; (2) location of grid resistors above switch groups, which are placed under the roof, reducing the length of connection between these two pieces of apparatus to a minimum. All the heat from resistors passes directly through the roof ventilators. The distributing valve is located inside the cab, as a protection against freezing. Fan motor and blower are located inside hoods, also one compressor installed in each hood, which eliminates considerable objectionable noises, which are caused when these two pieces are in motion.



Oshawa Railway Electric Locomotive Cab Interior, showing installation of equipment, with screens removed.

July 1920