

off, contains a vacuum pump for taking care of the water returns from the heating system of the machine and adjacent shops, the hot water instead of discharging into the sewers, being pumped to the round-house nearby for boiler filling, an economical innovation. On a ledge in the same pit, there is a 4 x 4 x 4 in. oil pump for handling the oil system of the locomotive shops. At present, there are a couple of tubular tanks to the north of the tube shop for the oil storage, but these are being replaced by two 10,000 gal. tanks to be located away from the building on concrete foundations. The oil from the tank cars is discharged into these tanks, draining from the latter to the pump. This in turn forces the oil to small storage tanks at various points in the buildings. One is located in the northwest corner of the machine shop, for the boiler plate furnace, another in the tube shop for the four furnaces there, and a third in the blacksmith shop for the furnaces in that department.

The oxy acetylene plant is also located in the tube shop, in a small room in the northwest corner. Acetylene is generated at the Fort Garry station for train lighting purposes, and to save a duplication of plants, 12 gas tanks are employed for the transportation of the gas in bulk from the station for shop use, the gas being delivered in pressure tanks 15 ins. in diameter by 4 ft. long at a pressure of about 150 lbs. Oxygen is generated in the room in a small heated retort containing potash and manganese, the oxygen passing through three cleansing barrels, the first and last of which contain water and the intermediate one caustic soda, before entering a gas tank 4 ft. in diameter by 6 ft. high. From this, the oxygen is drawn off into a 4 3/4 x 2 1/4 x 5 in. compressor, delivering the gas into gas tanks, of which there are six, at a pressure of 300 lbs. These several tanks with torches, etc., comprise the portable oxy acetylene welding outfit.

The electrical department is housed in a small building adjoining the northeast corner of the machine shop. The equipment is small, comprising principally a couple of winding machines for the repair of motors. All the electrical shop equipment is cared for in this department, necessary repair parts being also stored here in a small store room set aside for the purpose.

The principal part of the machine and erecting shop equipment was furnished by the following firms:—Jno. Bertram and Sons Co., Dundas, Ont.; Canada Machinery Corporation, Galt, Ont.; Geo. Richards and Co., Manchester, Eng.; Prentiss Tool and Supply Co., New York; F. E. Reed Co., Worcester, Mass.; Wm. Sellers and Co., Philadelphia, Pa.; Alf. Herbert, Ltd., Coventry, Eng.; Brown and Sharpe Co., Providence, R.I.; Pratt and Whitney Co., of Canada, Dundas, Ont.; Quincy, Manchester and Sargent Co., New York; W. P. Davis Machine Co., Rochester, N.Y.; R. K. Le Blond Machine Tool Co., Cincinnati, O.; Flather and Co., Nashua, N.H.; Westinghouse Air Brake Co., Pittsburgh, Pa.; Springfield Mfg. Co., Bridgeport, Conn.; C. Redman and Sons, Halifax, Eng.; Lodge and Shipley Machine Tool Co., Cincinnati, O.; Foote-Burt Co., Cleveland, O.; Diamond Machine Co., Providence, R.I.; Bullard Machine Tool Co., Bridgeport, Conn.; Niles-Bement-Pond Co., New York; Gisholt Machine Co., Madison, Wis.; Warner and Swasey Co., Cleveland, O.; Drees Machine Tool Co., Cincinnati, O.; Stevens Co., Galt, Ont.; Jones and Lamson Machine Co., Springfield, Vt.; Acme Machinery Co., Cleveland, O.; H. G. Hammett, Troy, N.Y.; R. McDougall Co., Galt, Ont.; Loew Mfg. Co., Cleveland, O.; F. Pratt and Co., Halifax, Eng.; Bausch Machine Tool Co., Springfield, Mass.; Sibley Machine Tool Co.,

South Bend, Ind.; Francis Hyde and Sons, Montreal; and Whiting Foundry Supply Co., Chicago, Ill.

THE BLACKSMITH SHOP, fig. 13, J. Kiepler, Foreman, is a structure 144 by 100 ft., similar in design to the machine and erecting shop, with similar methods of lighting and heating, forming a 3 bay wing running north from the west end of the machine shop, with which it communicates through a swing door in the east bay, a standard gauge track passing from the machine shop into the blacksmith shop a few feet, with a through service track the length of the blacksmith shop, and extending about half way across the machine shop, for the movement of forgings to the latter shop for finishing. The bays are each 33 ft. 4 ins. wide, the walls resting on 4 ft. 8 in. wide footings at a depth of 6 ft. The columns, built up of two 8 in. channels and two 10 x 1/4 in. plates, are carried on 5 ft. square concrete footings at a similar depth. The roof is carried on 20 in. I beams, with a clear height at the sides of 20 ft. Each

shop. A double connection for the steam hammer exhaust exists. Normally, the exhaust is direct to the sewer, but in winter, the other connection draws the exhaust steam off into the heating system, supplementing the supply from the reducing valve, effecting a considerable saving.

Along the east wall (left side of fig. 14), there is a row of nine 3 1/2 ft. diameter and 26 ins. high open forges, each supplied with a small anvil and employed on small general smith work. Down the centre of the shop, there is also a double row of 11 similar open forges, equipped in the same manner and operating on the same class of work. Both the pressure and exhaust fans for all the open forges, driven by a 75 h.p. motor, are located in the upper story of a small room in the northeast corner of the shop. The pressure is obtained from a 3 1/2 ft. centrifugal fan with a 15 in. delivery pipe running down under the ground, branches running along the rear of each row of forges with a 3 in. delivery pipe to each. Each forge has a cone hood with an 8 in. suction

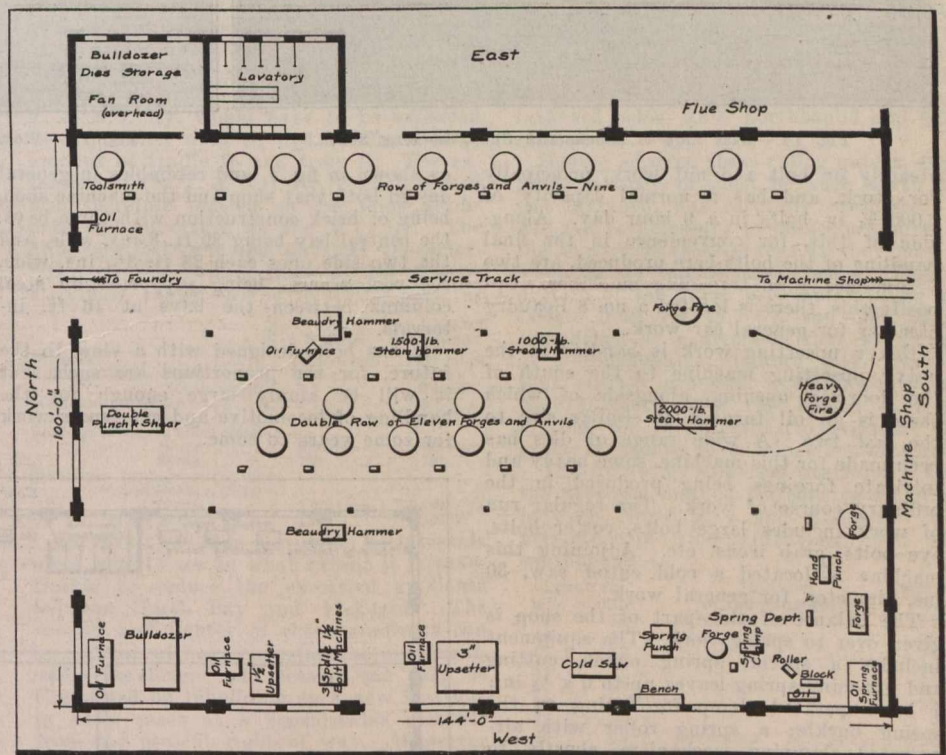


Fig. 13.—Interior Layout and Machine Distribution in Blacksmith Shop.

section has a 48 x 12 ft. skylight. The floor is of cinder.

The heaviest forging work is handled just inside the blacksmith shop, to the west of the machine shop door, shown in the background of fig. 14, an 18 ft. jib from the first column handling such heavy work as frames, etc., between a large open forge fire and a 2,000 lb. hammer. In the next section west, alongside the service track, there is another open forge fire to serve a 1,000 lb. steam hammer in the next section for lighter forgings. A 1,500 lb. hammer in the next section is used for general forge work. A steam pipe from an elbow at the heating system reducing valve in the roof of the southwest corner of the machine shop, connects with a receiver in the blacksmith shop, from which the steam hammer supply is drawn, the supply being steadier than if drawn directly from the main. Trouble from condensation in the pipes affecting the operation of the steam hammers is also reduced, a steam trap being attached to the lower end of the receiver, the drip being drawn off to the vacuum pump in the southwest corner of the tube

pipe leading up to a common suction pipe over each row in the roof trusses, enlarging to a 4 ft. diameter on entering an 8 ft. exhaust fan in the fan room, the fan discharging through the roof. The shop is thus kept remarkably free from smoke. The forge coal is stored in bins paralleling the shop on the east side, approached from the shop through the door on the east side. The coal is unloaded from a track running alongside.

In the fan room corner of the shop, there is a small forge fire for the tool blacksmith, with a small oil furnace to one side for tool tempering.

To the east of the double row of forges, there is a no. 6 Beaudry hammer, provided with a 4 ft. wide oil furnace, used principally on general car work.

In the centre of the north end, a double punch and shear with a capacity for 6 x 2 in. stock, is used for general blacksmith stock work, principally on cutting up bolt stock, and cutting up bolts that are made double ended in the upsetting machine for convenience in handling.

Bulldozer work is handled in the north-