

REPAIR SHOP PRACTICE IN COLUMBUS, OHIO

The Columbus Railway & Light Company, of Columbus, Ohio, has a very complete repair shop, which takes care of practically all its own repair work, and it also engages in the manufacture of material and repair parts much more extensively than the majority of companies. The shops are located in a group of three buildings, adjoining the Rose Avenue car

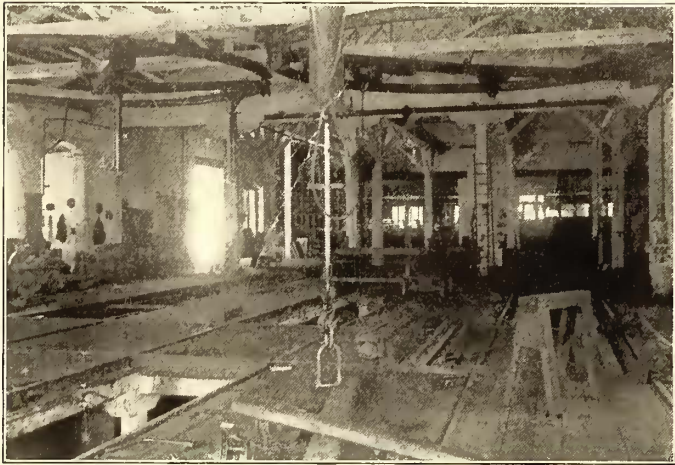


FIG. 2.—AIR HOISTS AND CIRCULAR CRANES

houses. An exterior view of the shop buildings and master mechanic's office is shown in Fig. 1. The pits and truck room are located in the front wing, which measures 55 ft. x 95 ft. The machine shop occupies the ground floor of a three-story building, formerly an old horse-car barn. The second floor of this building contains the armature and field coil rooms and a

hoists on circular cranes in the rear of the shop and one 4-in. hoist in the armature room. A Christensen direct-connected compressor, supplying 150 ft. of air per minute, discharges into a 42-in. x 10-ft. reservoir, which supplies the hoists and is used for other purposes. The car hoists have stirrup-shaped attachments, and in hoisting a car a timber is placed under each end of the car and through the stirrups. It is possible to hoist a car in half a minute. The circular cranes are used in handling



FIG. 3.—BRASS FOUNDRY

motors, armatures and trucks. Together they cover the entire width of the shop, the diameter of each circle being 24 ft. Each crane has two arms extending from the center to the circumference, these arms being pivoted at the center, with travelers at the outer ends. On the arms are also travelers from which the air hoists are suspended. The outfits were built



FIG. 1.—EXTERIOR OF REPAIR SHOPS, COLUMBUS RAILWAY & LIGHT COMPANY

stock room, 65 ft. x 65 ft., while the third floor is used for storage. The carpenter shop is in a wing, 48 ft. x 100 ft., at the rear of the main building. The paint shop, foundry and blacksmith shop are in separate buildings, a short distance from the main buildings.

Air hoists are used extensively in the truck room. For hoisting cars there are eight 9-in. hoists, each capable of lifting 3 tons, covering three pit tracks. There are also two 6-in. air

in the company's own shop, and cost \$240 each complete, including air hoist and connections. The circles were made from 8-in. I-beams, which were bent into proper shape on a wheel press. They were laid out with a templet, and steel-faced blocks were used in the wheel press. The I-beams were moved about 9 ins. at a time, and they went over the circle three times to insure accuracy. The outfit gives two cranes without any posts in the center of the room, and at a saving in cost of 200

per cent over the ordinary type of crane. The cranes were of great advantage this spring when the company changed motors on nearly 100 pairs of trucks used under box cars and placed them on trucks used under summer cars, and it was possible to change from six to seven cars per day with seven men in the shop. The Columbus system is broad gage (5 ft. 2½ ins.), and the company uses maximum traction trucks with a 20-in. pony wheel on the box cars and an 18-in. wheel on the summer cars. The closed cars have seventeen-tooth pinion and sixty-seven-tooth gear, while the summer cars have nineteen-tooth pinion and sixty-nine tooth gear, hence separate trucks were required.

For car lubrication the company

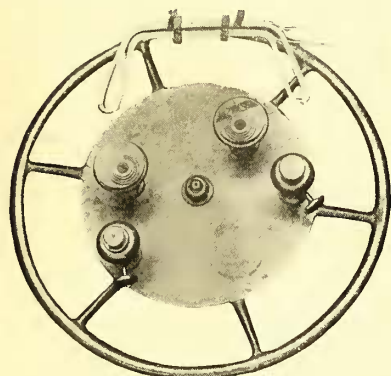


FIG. 6.—FORM FOR WINDING G. E.-800 ARMATURE COILS

uses Galena car oil. On motor bearings wick-feed armature cups are employed, of the type recently illustrated in the STREET RAILWAY JOURNAL as having been originated by this company. The journal boxes are packed with Perfection packing waste,

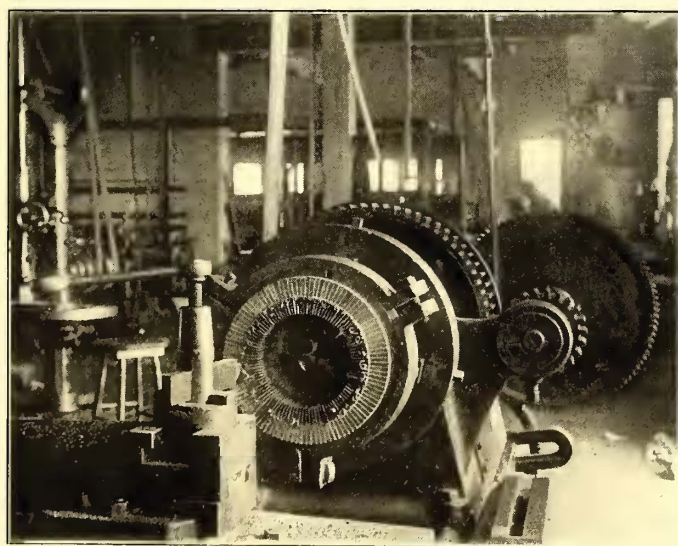


FIG. 4.—TURNING COMMUTATORS

the same as a freight car. The cost of lubrication on this system does not exceed 12 cents per 1000 miles.

The G. E. 67 motor is used as standard, and besides doing all its own armature work, the company builds all its own commutators.

Billings & Spencer drop-forged commutator bars are employed, with Chicago Mica Company's mica bars as segments. These bars are assembled in a three-part clamp, as shown in Fig. 5, and faced and slotted in a lathe, as shown in Fig. 4. The commutator is held in place while being turned and banded on the outside by a core, which is cast in two sec-

tions and drawn together by a large bolt and nut, as shown in Fig. 5, with a commutator segment inserted. The men have slotted, set up and turned commutators ready to go into armatures in 1½ hours, and the average time is less than 2 hours.

For winding G. E. 800-armature coils the company uses a specially designed form, which consists of a large brass hand wheel provided with spools having ridges suitably arranged for



FIG. 7.—INTERIOR OF STOCK ROOM

this particular coil (see Fig. 6). Two of the spools have release plugs which slip out for removing the coil. All armature and field coil winding is done by one girl in a winding room, which is located on the second floor. Taping is done by hand,

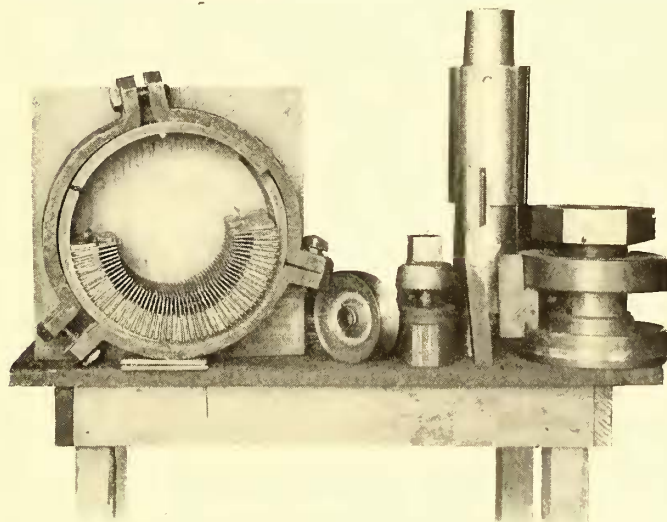


FIG. 5.—CLAMP AND COMMUTATOR SEGMENTS, ARBOR FOR TROLLEY WHEEL, TOOL FOR TURNING TROLLEY WHEEL, EXPANDING MANDREL AND COMMUTATOR CORE

as it is claimed it can be done more accurately than by machine. Coils are first taped with white braid, and then dipped in armalac, and the portions which fit into the armature slots are taped with Star friction tape. The coil is then taped the second time with linen tape, and then dipped in Massachusetts Chemical Company's armalac insulating varnish.

A small but well equipped brass foundry takes care of a remarkably large amount of work. One man, at \$2.50 per day, does all the work in this department, including making of cores and babbiting. The company produces practically all the brass castings required in the operation of the system, in-

