

of the transfer table, while the northward tunnel is 42 ins. square, reducing to 24 ins. square at the other end of the transfer table. The southward tunnel is slightly larger, as from two points along the south wall tunnel, there are two 15 in. diameter pipes leading across the shop, under the southerly four pits at right angles to them, with outlets 10 ins. in diameter leading out into the sides of the pit, with a damper provided for each.

From the first apparatus room the major portion of the heat passes out to the north through a 54 in. square tunnel, gradually reducing in size along the west and north sides of the shop to 18 ins. square at the north end of the transfer table. The tunnel in the easterly direction from the apparatus room is 28 by 24 ins., reducing to 24 ins. square at the south end of the transfer table. Across the end of the transfer table, the two heating tunnels communicate through a 24 in. square tunnel for the passage of the steam and return mains, but have baffle plates at each end to interrupt the flow of air.

The local heating of the shop from the heating tunnel is by means of heating headers located at intervals along the wall, against which they lie flat. The majority of the headers are standard in size and construction, built of an 8 by 24 in. box of no. 12 iron, united at the corners with 1 by 1 by 1-8 in. angles, and rising to a height of 4 ft. above the floor, and projecting to the tunnel under the floor, the header being supported on the floor by a 2 by 2 by 1/4 in. angle. Near the top of the header there is a double deflecting plate, directing the air outward through both sides, through heavy netting, the opening in which is half the depth of the header. From these the air is forced out into the shop. The majority of the headers are of the 8 by 24 in. size, but there are also 8 by 15 and 8 by 18 in. sizes, used along the walls between the windows, where the headers are more closely spaced, while the larger sizes are used principally between the large doors. In the offices, smaller headers lead in from the tunnel.

The outlying buildings are all heated by direct radiation from steam coils. The only important system in the lot is that in the general stores building, where the local steam main from the main that passes along the west side of the shop, connects with a system of 1,760 ft. of 1 1/4 in. pipe, arranged in coils.

THE LIGHTING of the shops has been carefully attended to, with due consideration to the points where the maximum amount of light is required. For this purpose, the tungsten light is peculiarly adapted, having a wide range of sizes of illuminating units. In the section of the shop to the north of the transfer table, the lights are arranged in rows of 10 between the tracks. In the paint and erection shop portion of this end, the lights are all 250 watt, excepting the 9 at the transfer table end, which are all 150 watt. In the mill section the lights are nearly all 150 watt, with here and there over certain of the machines, these are increased to 250 watt. Over the transfer table is a row of five 100 watt lamps. Between each of the lifting hoists are six 100 watt lights, while down the machine shop section are four rows of 150 watt lamps, interspersed in which are a few 250 watt lights. In the general stores building there are seven 150 watt lights down the centre, with a similar row along each side of 100 watt lights. All lights are suspended from the roof girders.

FIRE PROTECTION AND WATER SUPPLY.—The fire protection of the main building and general stores building is arranged for by a system of thermopiles

located under the roof. In the main shop there are two separate circuits, one for east of the transfer table, and the other for west of it, each containing 50 thermopiles, and the general store is on a circuit containing a fewer number of thermopiles. These three circuits connect to three galvanometers in a case on the wall at the west end of the transfer table which is the focal point of the shop, where the time clocks are located, and where the watchman is stationed. Normally, the galvanometer indicator shows a safe sign, but in the event of any abnormal heat, which would strike the roof first, the thermopiles would cause the galvanometer to deflect, the greater the heat, the greater the deflection, as the thermopiles are in series. Deflection beyond a certain point leaves the needle in the operating field of a strong magnet, which draws the needle still further out of its normal position, closing an electric circuit, and ringing an alarm bell.

In a separate case adjoining this thermopile alarm indicator, there is another alarm box for the smaller buildings, with a connection from the boiler room, oil house, lumber kiln, pattern storage and impregnating room. Local heat at any one of these points causes a hinge switch in the alarm box to trip, this action closing another switch, ringing the alarm bell.

At Youville, the city water pressure is in the neighborhood of 125 lbs. In consequence, this is ample for fire protection without further boosting through an auxiliary fire pump. The water supply enters the main building at the northeast corner, through an 8 in. water main to a water meter at that point. From there the main is divided into fire and water service pipes. All pipes are under the floor, with headers at intervals.

The fire service main, 8 in. pipe, divides near the corner, a 6 in. main running south along the second row of columns, and another 6 in. main west along the first row of columns. There is also a 4 in. main that runs back from the meter about 100 ft. from the entry corner of the building. The machine shop has six hydrant connections, three at the outer and central columns in the line of the main, and three in the line of columns centrally with the car hoists. Five of these are from the southerly main, this main also branching out to a hydrant about 100 ft. diagonally from the south east corner of the building, with another branch from a central point to a hydrant outside the centre of that side. This main terminates in two hydrants in the general stores building.

The westerly main from the entry corner contains one of the machine shop hydrants. The arrangement in the westerly half of the building is the same as in the easterly. There are six hydrants in that section with three hydrants outside to the west, at the corners and centrally. On the south there are also two outside hydrants between the general stores building and the main building, and on the north, a single hydrant centrally located on that side, making 23 in all.

Service water is piped all over the buildings in a similar manner, with connections attached to the columns at convenient points. The tiling of the building for sewage purposes is also very complete, the different interior systems all draining to a central westerly 15 in. sewer, to a large gully at the west end of the shops. On the south and east sides of the shops are five smaller gullies for draining the surrounding ground, these all connecting with the central sewer and draining into the west main gully. This passes off through

an 18 in. vitrified tile sewer, sloping to the west on a 0.4 per cent. grade, connecting 1,000 ft. to the west with the Montreal St. Denis Street relieving sewer.

CONCLUSION.—This plant is said to have been designed on the same general lines as the Plank Road shops of the Public Service Co., of New Jersey.

The general design and construction were carried out under the direction of D. E. Blair, Superintendent of Rolling Stock, who is in charge of their operation. Remelius acting as consulting engineer. The designs of the buildings were developed by Marchand and Haskell, architects, Montreal, the engineering work being done in the Montreal Tramways Co.'s engineering department, under J. D. Evans, Chief Engineer, and R. M. Hannaford, Assistant Chief Engineer.

Toronto Railway Company's Annual Report, Meeting, Etc.

Following are extracts from the report for the year 1912, which was presented at the annual meeting, Feb. 5:—

Gross earnings	\$5,448,050.36
Operating, maintenance, etc.	2,866,550.12
Net earnings	\$2,581,500.24
Dividends	\$879,595.85
Bond interest, etc. ..	190,992.76
	\$1,070,588.61
Payments to City:	
Percentage on earnings	\$798,958.66
Pavement charges ..	90,953.00
General taxes	52,137.30
	\$942,048.96
	2,012,637.57
	\$568,862.67

The increase in gross passenger earnings, compared with the previous year, is \$567,035.00; the earnings being \$5,367,502.48, against \$4,800,467.48 for 1911. Notwithstanding the large increase in gross earnings the surplus was reduced largely by the operation of additional cars placed in service, a higher rate of wages paid to conductors, motormen and other employees, also the cost of material of all classes having advanced in price. The charges of the year were \$2,866,550.12, compared with \$2,653,361.86 the previous year. The percentage of operating cost was 53.4% of passenger earnings.

The payments made to the City of Toronto were \$942,048.96, which was an increase of \$119,815.72, or 14.6% over 1911.

In addition to entirely renewing the battery plant at Frederick and Front Streets, there was expended during the year on capital account, \$591,484.70 in building additional rolling stock and procuring electrical equipment for same, the construction of new tracks and erection of overhead work in various sections of the city, additions to buildings, and other improvements.

On March 25 a fire occurred at the King St. East Division, completely destroying the car storage house in rear of the main building, together with about 150 cars, practically all of which were of the open, or summer type. The property was insured.

The company's agreement with its employees expired on June 15. After a number of conferences, all differences were amicably adjusted, an increase in wages was granted, and a new agreement entered into for three years.

The second drawing of the company's currency and sterling bond issues, under the terms of the mortgage deed dated Sept. 1, 1892, took place June 27, the company being obliged under the mortgage deed to redeem by drawing annually 5% of bonds issued, to be redeemed on Aug. 31 following the date of drawing, and from which date no interest is payable. The full number of bonds drawn in June, 1911, amounting to