

# Street Railway Journal

Vol. XVI.

NEW YORK AND CHICAGO, SEPTEMBER 1, 1900.

No. 35.

## OPERATING METHODS OF THE COLUMBUS RAILWAY COMPANY

Columbus is practically the geographical center of Ohio; it is the greatest railroad center in the States, and is the State capital. Located here are the State House, the State penitentiary, institutions for the blind, insane and feeble-minded and deaf and dumb; there are also here United States barracks, accommodating 6000 soldiers. The city

tion to Livingston Avenue, a distance of about 7400 ft., being twenty-five in number. The spacing varies somewhat, according to the length of the different squares. The arches are supported upon the steel side poles of the railway company, the support beginning at a point about 16 ft. or 17 ft. above the pavement. The center of the arch is about 26 ft.



VIEW ON HIGH STREET, SHOWING METHOD OF ARCH ILLUMINATION

has a population of some 150,000 people, making it third in the State, and it includes within its corporation boundaries 16½ square miles of territory. A large number of societies hold their conventions at Columbus, and, owing to its many attractions for the Ohio citizen, the number of excursionists who visit it throughout the year is very large.

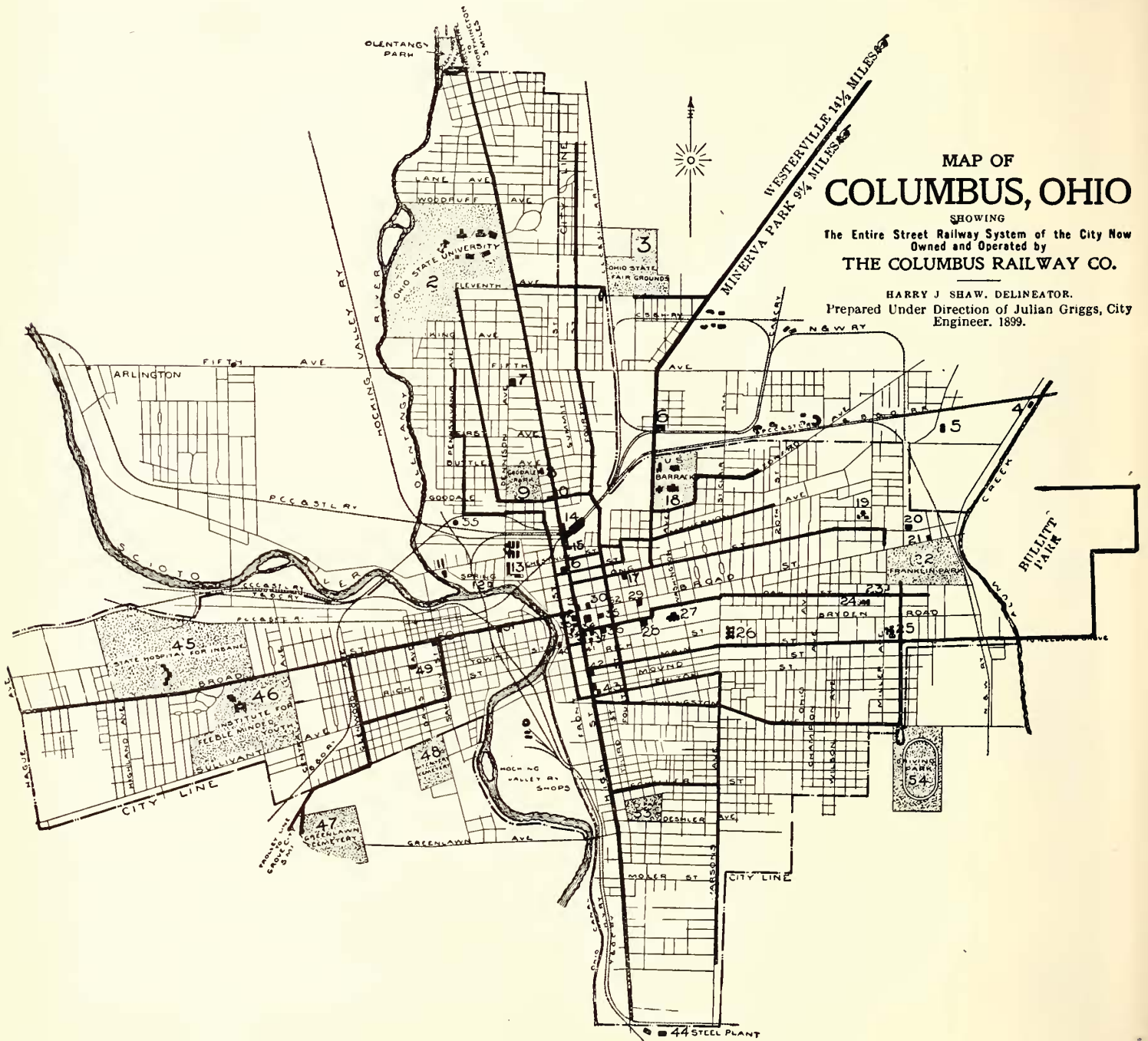
The engraving on this page gives a view of one of the principal thoroughfares in the city, High Street, and also illustrates the ingenious and attractive method of illuminating the street by arches. These arches are placed at intervals along High Street from the Union passenger sta-

tion to Livingston Avenue, a distance of about 7400 ft., being twenty-five in number. Each span carries fifty 16-cp incandescent lamps, the receptacles for which are wired in a hood extending beneath the arch; this hood is painted white. The current is furnished by a local electric light company, payment for which is made up by an appropriation from the city of a certain sum, and subscriptions from the various property owners and store keepers along the street. The cost has been put very low, being \$19 per month per arch. The lamps are lighted every night during the year. This is in addition to the regular arc lights. The weight of the arch proper, *i. e.*, the steel work, is ap-

proximately 1000 lbs., and the cost was about \$150. This does not include the wiring and the lamps. This method of street illumination has been favorably commented upon by visitors to Columbus, and is one of which the residents along the streets feel justly proud. In another section of the city, called the "Hub," located in the vicinity of Fourth and Main Streets, this arch system of lighting is also used, but upon a smaller scale.

The Columbus Railway Company owns the entire street

for reaching them. Excursion trains are met by representatives of the company and these folders given out freely to all visitors. In this way some 60,000 have already been distributed this season. In addition to the folders the company publishes a handsome 52-page illustrated guide to the city and pleasure resorts, with map and street railway directions. These are mailed to Sunday schools, societies and others throughout the State, and assist in making up sight-seeing routes. The company believes that



railway system, the lines of which radiate in all directions from the city's center with a total length of 98 miles. In addition to the city lines the company operates an interurban road from Columbus to Westerville.

The company, appreciating that street car riding is as much habit as necessity, encourages patronage in many ways. Visitors are informed by a sign at the entrance to the Union Railroad Station that a map of the city may be had for the asking. This is the street railway company's folder, and contains a map of the city, handsome views of the chief points of interest and comprehensive instructions

this advertising not only brings many people to Columbus who would not otherwise come, but by helping them to economize their time while in the city, results in their riding more often on the street cars.

To further encourage patronage, the company operates two pleasure parks. Olentangy Park has few equals in natural beauty. It contains 37 acres, and is cut across by numerous deep ravines, so shaded by overhanging trees that the sun rarely gets into them. Along one side of the park runs a branch of the Scioto River, affording splendid boating and delicious bathing. One of the most popular

features of the resort is the toboggan slide, which is a "shoot the chutes" on a small scale. Each bather rents his own toboggan, which he must himself carry up the incline. Added to the exciting ride down the incline is the pride of sliding furthest over the water before the toboggan sinks. Although the park is thick with trees, it is well lighted at night by a multitude of incandescent lights, even the river being illuminated throughout the length of the park. Disregarding the popular notion that people who have a chance to sit down do not spend their money, the park is everywhere furnished with comfortable benches. The most prominent of the buildings is the magnificent theater, whose spacious veranda, surrounded by a dense growth of trees, overhangs the Olentangy River 50 ft. below. The theater building is 80 ft. x 250 ft.; the auditorium is large, cool and comfortable, seating 2248 people. Ice water is supplied free from suitable tanks placed at convenient points through the grounds.

Minerva Park covers 150 acres. It is not so favorably located as Olentangy, but the same care is exercised to make it a popular and pleasant pleasure ground. It has bowling alleys, scenic railway, "shoot the chutes," etc., and a theater seating 2500 persons. This

building. Among devices of interest is a circular crane for handling trucks, motors, etc., and fully illustrated in the accompanying engraving. It is the intention of the company to equip this circular crane—as well as the car body hoisting trolleys—with compressed air hoists. Christensen direct-connected motor compressor and air hoists are to be used. A device for making armature coils is also shown. The reducing gear is for the purpose of giving a slow speed and avoiding any back lash.

The company has had excellent success in splicing cars. Twenty of these have been in service for four years, and



THEATER AT OLENTANGY PARK



GATEWAY TO OLENTANGY PARK

park is forty minutes out from the city, a 15-cent fare for the round trip being charged, which includes admission.

The company's rolling stock is maintained in the best possible condition, with the fact in mind, as stated above, that many people ride for pleasure or from habit, and clean, comfortable, handsome cars go far toward increasing the road's receipts. The car equipment consists mainly of double-truck cars. Owing to the wide gage (5 ft. 2 ins.), the company uses the bicycle truck under all its double-truck cars. The standard box car is 28 ft. inside, with 4-ft. 6-in. platforms, the standard open car is 36 ft. over all, with twelve seats, and vestibuled. The company much prefers the vestibuled to the ordinary type of glass front. Following what is now very general practice, the company has party cars, which are rented by the hour or evening.

The repair shops are located in a large and well equipped

are apparently in as good condition as when the work was done. They are of special value, owing to their large carrying capacity and light weight. The spliced car bodies weigh a little over 9000 lbs., while new bodies of the same dimensions, which the company recently bought, weigh slightly over 14,000 lbs.; in other words, the spliced cars carry just as many people and weigh but little more when loaded than the new cars when empty. A working diagram is given, showing the general plan for splicing cars, with the arrangement of timber before covering over.

For use on interurban roads the company has spliced together two 22-ft. side seat combination cars, making a car body 42 ft. long. These cars were spliced in the same manner as shown in the accompanying plan, except that two 6-in. I-beams, filled in with oak on each side and running the full length of the car, have been added to provide for the heavy strain of interurban service. These cars have twenty-six seats upholstered in red plush, and seating fifty-two passengers. The cars are lighted by electricity and Pintsch gas. The company owns its own Pintsch gas plant, from which it supplies the gas to its interurban and private cars, and also to the steam railroad companies passing through the city, piping the gas from the plant to the Union Depot, about a mile away.

Another sketch shows the method of cleating wires under the side of the car in preference to using a cable the entire length. The wires are cleated, as shown, the full length of car underneath side seats, entering a cable at the ends which carries the wires under the platform to the con-

trolley. All wires where passing through the floor or timbers of the car are protected by porcelain bushings. These porcelain bushings are considered a very important feature and have done much to increase the efficiency of the

bicyclist who was struck by a car running at full speed. Both man and wheel were caught on the fender under the car, and when pulled out were unhurt, the man riding away on the wheel.



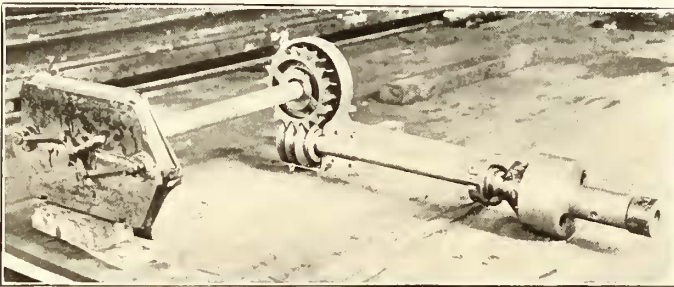
PAVILION IN MINERVA PARK



ENTRANCE TO MINERVA PARK

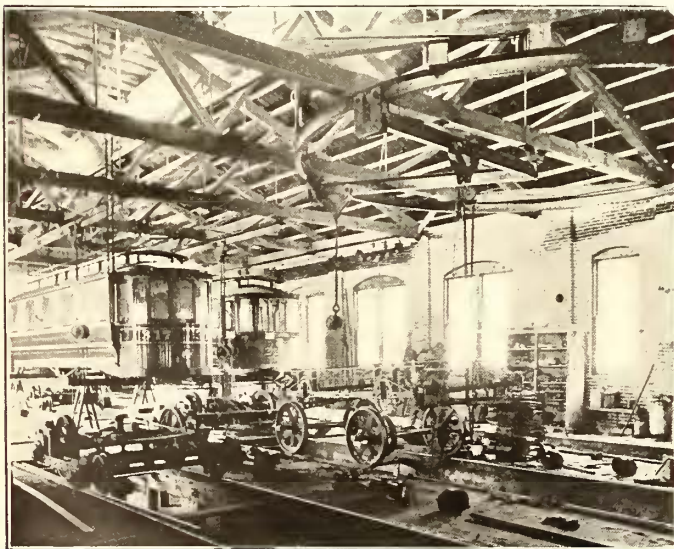
wiring. The total maintenance cost for all rolling stock is less than 1 cent per car mile.

Each car is fitted with an automatic fender, which costs,

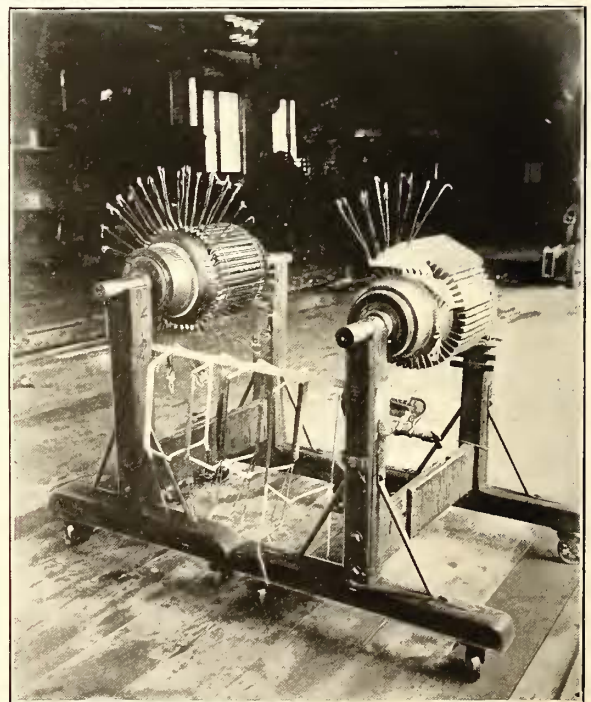


GEARING FOR WINDING ARMATURES

Trolley wheels, trolley harps and journal bearings are made in the company's own brass foundry. Trolley ears 14 ins. long cost  $16\frac{1}{2}$  cents apiece. Armature bearings have a composition of 80 per cent copper, 12 per cent lead, and 4 per cent each of phosphorus tin and pig tin, and show a life as high as three years. The journal bearings are bored in special design jig, which bolts on to the carriage of a lathe, using a boring bar with four cutters, viz.: A cutter at each end for facing the ends of brasses, a roughing cutter, which roughs out the work, and a finishing cutter,



CIRCULAR CRANE IN ROSE AVENUE SHOPS



RACK FOR WINDING ARMATURES

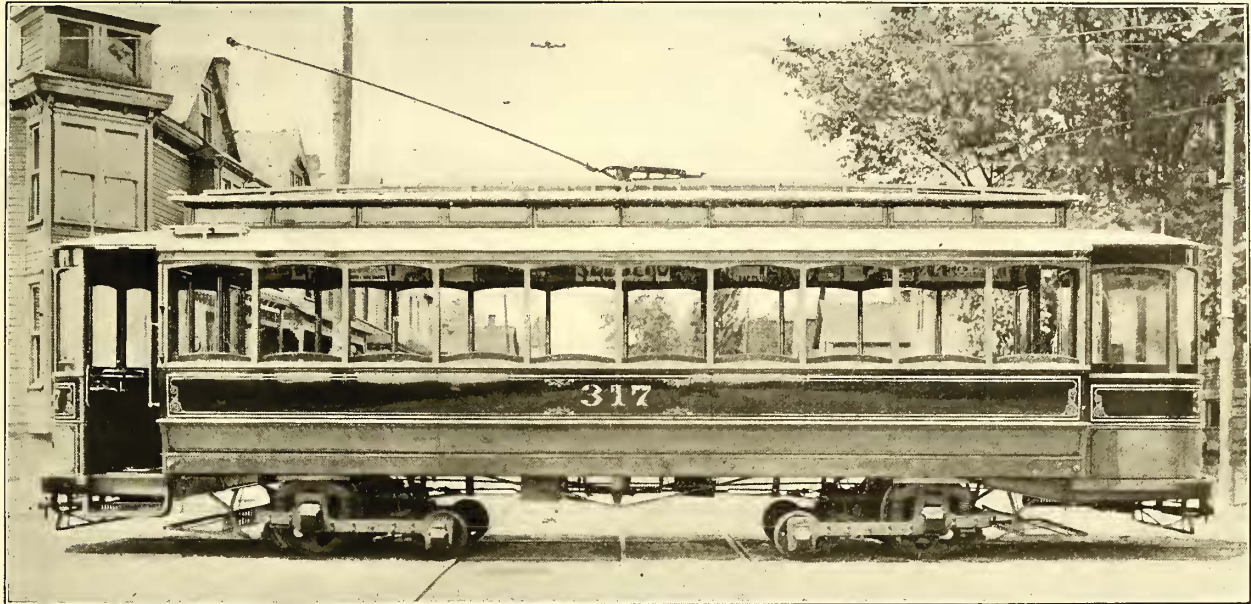
complete, \$18. The company believes thoroughly in the use of fenders, and that they save many lives and serious accidents. One interesting case on record is that of a

which sizes the brass. With this arrangement it is not necessary to caliper the brasses, except when setting the cutter; one setting of the finishing cutter will bore some-

times as many as fifty bearings before needing sharpening.

The company's standard for new track and roadbed construction is 74-lb., 8-in. T-rail, laid on oak ties. The ties are laid on a bed of broken stone, which is also tamped in between up to within about 2 ins. of the tops of the ties. Then a layer of cheap concrete, flush with the tops of the

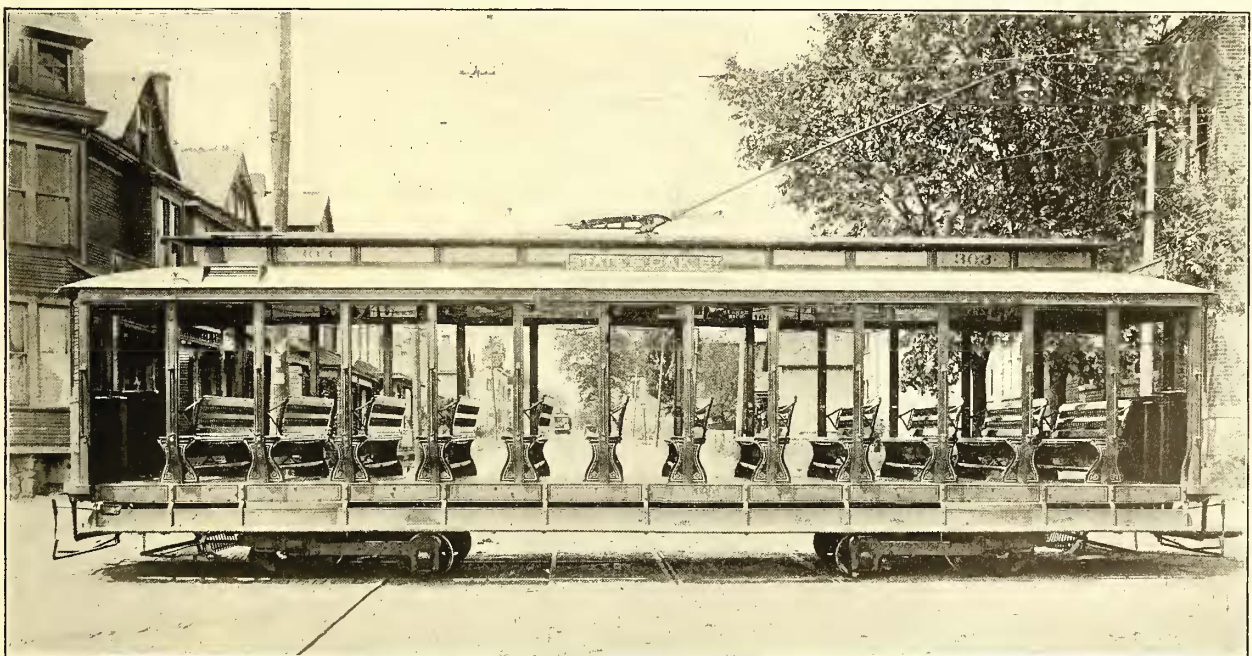
formation which a manager would want in as concise a form as possible, and in a way which would require but a small amount of work to keep up. The record is divided into two sections: The first shows straight track, location of special work, kind of rail, pavement and joints; the second part is devoted to details of special work. Dis-



STANDARD CLOSED CAR

ties. This is to keep the sand in which the paving blocks are imbedded from sifting down into interstices between the blocks of broken stone. This practice has greatly improved the quality and life of the pavement. The company paves to a foot outside of its rails. There are a large

tances on straight track sheet are noted by 1000-ft. stations. Cross streets are not shown, only the exact location of the intersection of the cross street nearest each 1000-ft. station. Points of special work, curves, change of rail section and change of pavement, or a change in the kind of



STANDARD OPEN CAR

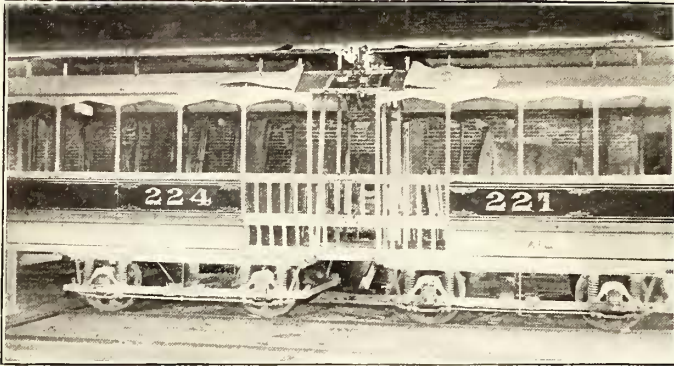
number of cast-welded joints on the system, and more will be put in this fall. They were put in by the Milwaukee Rail Joint & Welding Company, and the railway company itself, which now owns its own welding outfit. These joints have given excellent satisfaction.

In connection with the track work it should be stated that data relating to this department are kept in a very systematic manner. In general the idea is to get all the in-

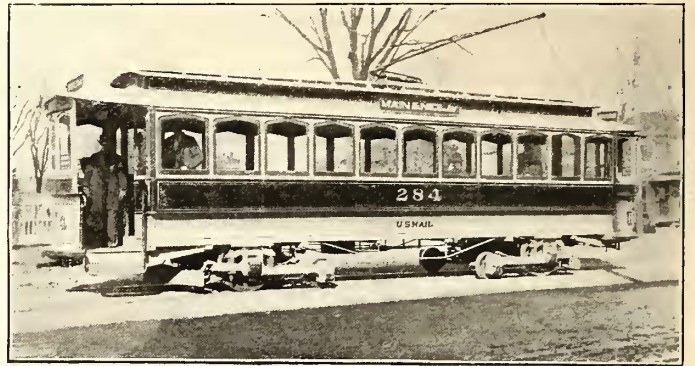
formation which a manager would want in as concise a form as possible, and in a way which would require but a small amount of work to keep up. The record is divided into two sections: The first shows straight track, location of special work, kind of rail, pavement and joints; the second part is devoted to details of special work. Dis-

of the company by which the work was made, height of rail, original drawing number, weight of rail and maker's

made. These records are all drawn on tracing cloth, from which blue prints are made once a year, and bound in a



METHOD OF SPLICING TWO 16-FT. BOX CARS



CAR MADE BY SPLICING TWO 16-FT. CARS

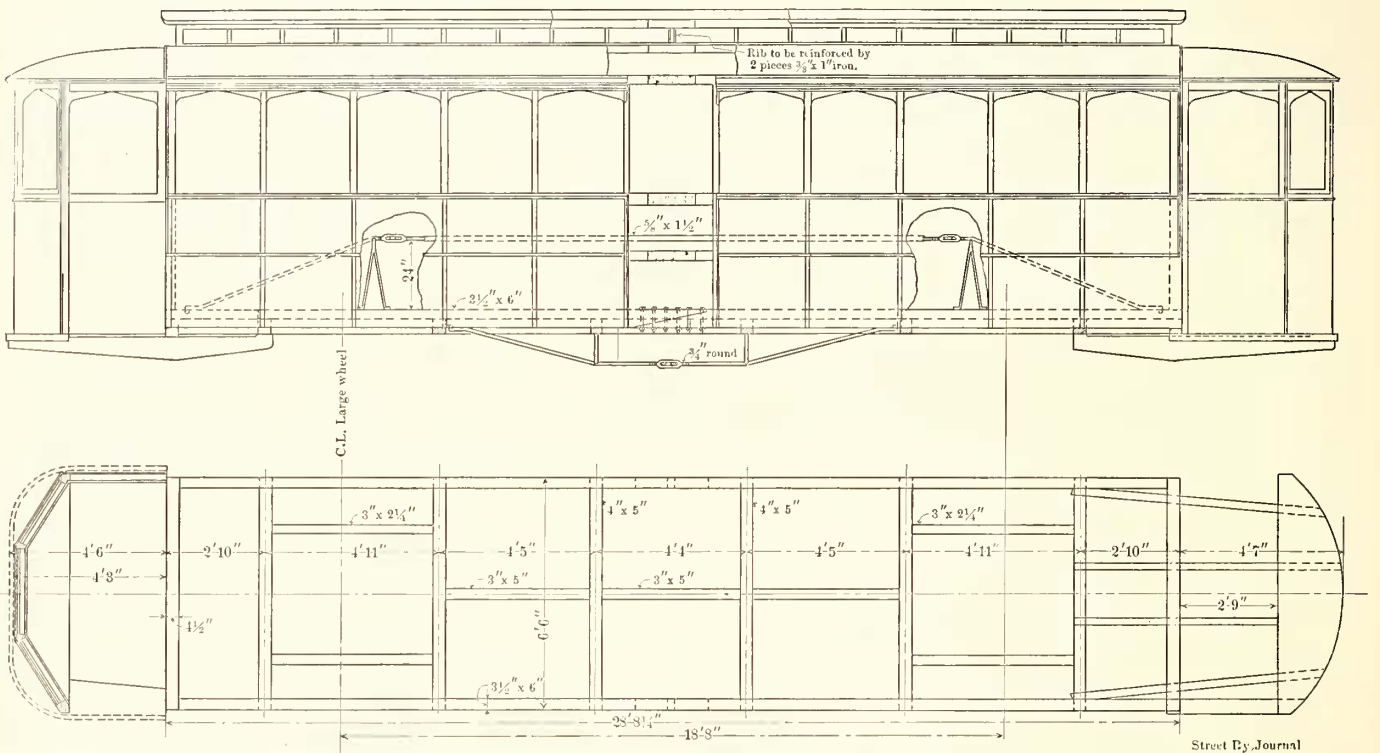


DIAGRAM SHOWING METHOD OF SPLICING CARS



INTERIOR OF TROLLEY PARTY CAR



VIEW ON NEIL AVENUE, USED LARGELY FOR EVENING PLEASURE RIDING

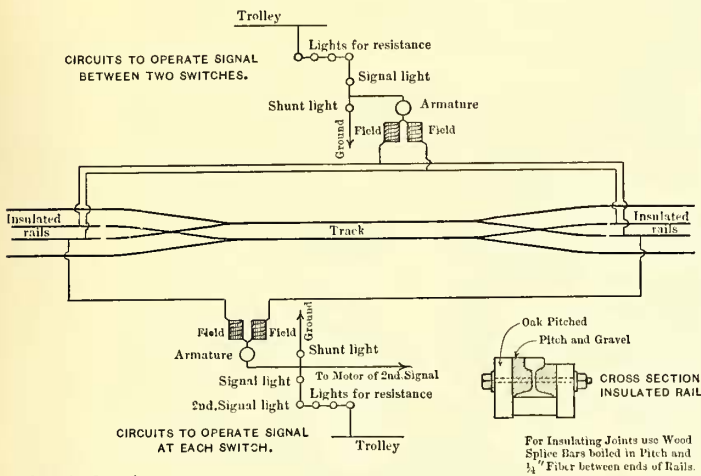
section number and the time work was laid. Renewals or repairs which were made to this work are also added as

special binding made to fit the sheets; in this way the tracings are not handled at all, and form a permanent record.

Changes in this record are noted upon the tracing from track foreman's report. Once a year the entire record is very carefully gone over and verified.

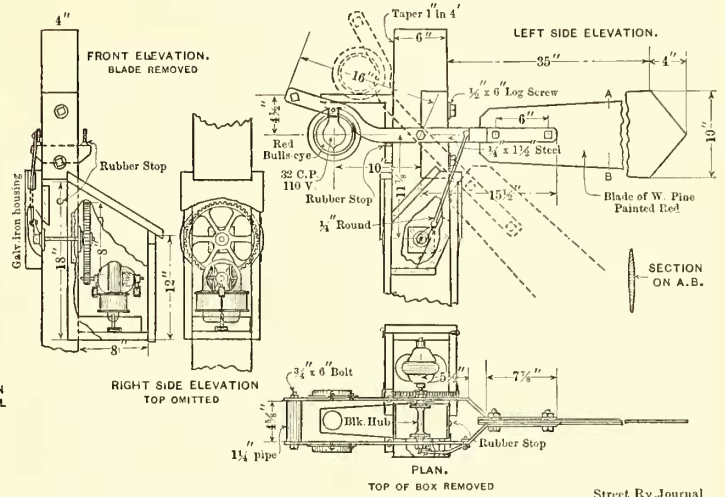
On the Westerville interurban line is installed an interesting automatic signal, designed for use between

revolution to throw the target from up to down. This signal forms a very simple locking device, and gives a maximum torque to start arm either up or down. The signal is operated by the wheels of the car passing on to an insulated rail, which rail is connected to the motor, axle



Street Ky. Journal

DIAGRAM SHOWING CONNECTIONS FOR SIGNAL



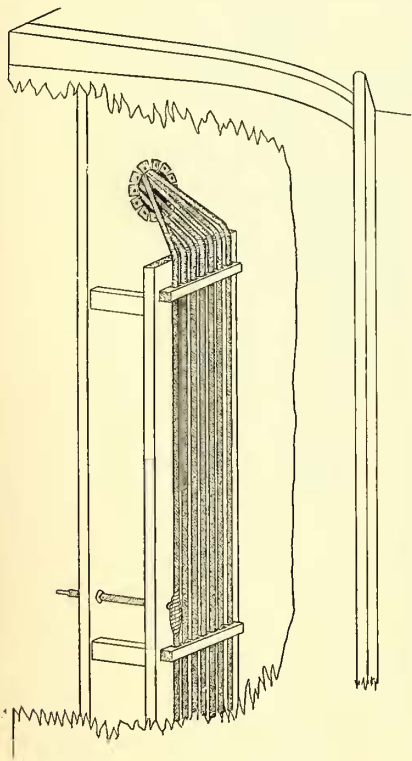
Street Ry. Journal

BLOCK SIGNAL

switches. This signal is thoroughly reliable, and a great assistance in the operation of the road. The design is somewhat crude, yet very substantial and positive. The signal arm is carried on the spindle of an ordinary bicycle wheel hub, the hub being securely fastened in the post, and the spindle to the side of the arm revolving in ball bearings on each end. This arrangement gives a very sensitive arm, and the side bearing prevents wind pressure from the side having any material effect upon its operation.

and car wheels, making the ground connections between insulated rail and ground. This circuit is clearly shown in the accompanying sketch. One field coil of the motor is used to throw target up and the other field coil so connected as to operate arm in other direction. The signal motor is shunted around a 50-volt lamp, which gives only 50 volts between insulated section of rail and the ground; in fact in actual practice the voltage is not even this high, as enough leakage will take place to reduce this voltage to about 30 volts, which is too low to be noticed by coming into contact with rail.

The company has two power houses, one of which was



METHOD OF CAR WIRING



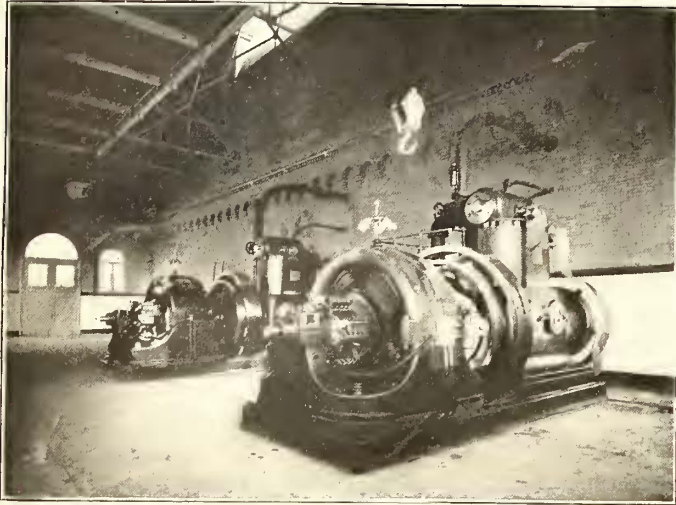
INTERURBAN CAR ON WESTERVILLE LINE

One end of the arm is made of white pine, painted red; the other end has two red bull's eye lights which cover or expose an incandescent light for night signal. The arm is operated by a Western Electric Company's 16-in. fan motor, geared to a countershaft, which is connected to the arm by a small crank and connecting rod. The crank is arranged to make a little more than half a

revolution to throw the target from up to down. This signal forms a very simple locking device, and gives a maximum torque to start arm either up or down. The signal is operated by the wheels of the car passing on to an insulated rail, which rail is connected to the motor, axle

acquired by purchase, and is used largely as an auxiliary. The first, the Spring Street station, has two Buckeye tandem compound-condensing engines of 750-hp each, direct-connected to G. E. 500-kw generators. This station has also one cross-compound Green-Wheelock engine of 1200 hp, direct connected to an 850-kw G. E. generator; three McIntosh & Seymour tandem compound engines of 300

hp each, belted to G. E. generators; Wheeler surface condenser, Cockran oil separator and Babcock & Wilcox boilers. There is also an automatic gravity oiling system, which was installed several years ago, and was one of the first in the State; the drips all run back to the oil room through a waste and sand filter, and from the storage tank

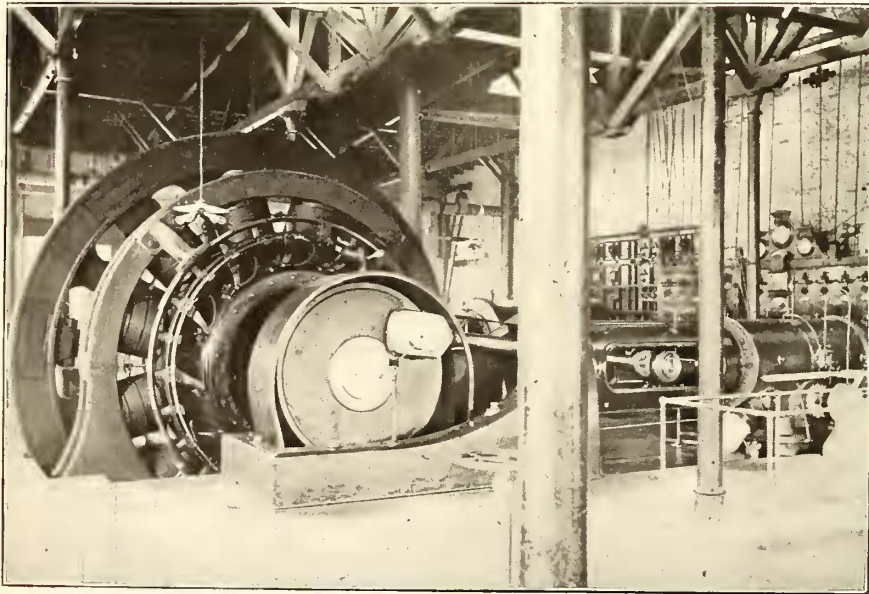


INTERIOR OF MILO POWER STATION

the oil is pumped back to the pressure tanks located in the engine room.

The Milo station is equipped with eight Stirling boilers, aggregating 2400 hp, Murphy furnaces, Green economizer and three Westinghouse engines, aggregating 1100 hp, direct-connected to Westinghouse generators. At this station there is installed a We Fu Go purifying system, which has given excellent satisfaction, having done away entirely with the necessity of cleaning the boilers.

The Columbus Railway Company has had no trouble



INTERIOR OF SPRING STREET POWER STATION

with its employees for many years. A graded schedule of wages for motormen and conductors is in force. For the first three months in the company's service the employee received  $15\frac{3}{4}$  cents per hour; for the next nine months  $16\frac{1}{4}$  cents per hour, and  $17\frac{1}{4}$  cents per hour thereafter. Men who have been in the company's employ for six months are paid the same interest on their earnings for each six months as is paid on the preferred stock of the company.

Men who have served for five years receive each year thereafter one free uniform, and as a mark of such service are allowed to wear a gold band upon the arm. After ten years of service another gold band is added on the arm and the company issues to the man without charge two uniforms per year. Fifty per cent of the company's men have one or more bands. The qualifications necessary to a successful application for the position of motorman or conductor are good health, good moral character, good eye sight without spectacles, hearing, heart and lungs sound, free use and movement of hands, arms and legs; age between twenty-three and forty years; must weigh not less than 150 lbs., if an applicant for conductor, or not less than 175 lbs., if applicant for position as motorman, and height must exceed 5 ft. 9 ins.

The Columbus Railway Company was incorporated in Aug. 18, 1889, and is a consolidation of the Columbus Street Railway Company, chartered April 25, 1892; the Crosstown Street Railway Company, chartered Feb. 24, 1893, and the Columbus Central Railway Company, chartered March 8, 1893. The company is capitalized for \$7,000,000, half of which is common and half preferred stock. The property has a mortgage indebtedness of \$5,086,000. The officers of the company are: President, Robert E. Sheldon; first vice-president and treasurer, Edward K. Stewart; second vice-president, Clarence M. Clark; secretary and auditor, P. V. Burington; general superintendent, M. S. Hopkins.

#### Trial Trips on the Wannsee Bahn

At last trial trips are being made with electric trains on the Wannsee road, near Berlin, which has been equipped by Siemens & Halske. Each train consists of nine three-axle passenger cars, each having five compartments for ten passengers each. The first and last cars have a motor on each axle, or a total of six motors. In starting, the two groups of three motors are each connected in series. As soon as a certain speed has been attained the motors on the last car are cut out. The train, which is being used for experimental purposes only, at present, is fitted with measuring instruments, which show the current consumption at all times. To compare the cost of electrical operations with steam locomotive service, the same class of measurements are made on the steam locomotive. It has been found that at the start the motors consume 200 amps., the average power at the start is 600 hp, and during the run about 300 hp is required. The time taken to get the train up to full speed (40 km per hour) from a standstill is ninety seconds, while during this time the train passes over a distance of about 500 meters. The train is completely braked in thirty seconds within a distance of 170 meters. According to this, the distance between Berlin and Zehlendorf being 12 km, the trip can be made in twenty-seven minutes, and the stops about one minute in length. This schedule must be adhered to when the train is fully loaded, *i. e.*, twenty-nine axles, 220 tons, including the weight of the 410 passengers.

M. K. McMullin, of Pittsburgh, has purchased control of the West End Traction line of that city. It is supposed that the road has been bought in the interests of the Union Traction Company.