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NOTICE TO SUBSCRIBERS

REMITTANCES.—Remittances should be made by check, New York draft, or money order, in favor of the STREET RAILWAY JOURNAL.

CHANGE OF ADDRESS.—The old address should be given, as well as the new, and notice should be received a week in advance of the desired change.

BACK COPIES.—No copies of issues prior to September, 1904, are kept on sale, except in bound volumes.

DATE ON WRAPPER shows the month at the end of which the subscription expires. The sending of remittances for renewal prior to that date will be much appreciated by the publishers.

CHANGE IN ADDRESS

Commencing with this issue the address of the main office of The Street Railway Journal is

239 West Thirty-Ninth Street, New York City

Of this issue of the Street Railway Journal 8000 copies are printed. Total circulation for 1907 to date 303,850 copies, an average of 8214 copies per week.

Our New Home

An article elsewhere in this issue describes the new home of the STREET RAILWAY JOURNAL at 239 West Thirty-Ninth Street, New York. The previous office of this paper and of the McGraw Publishing Company, at 114 Liberty Street, has been too small for the purpose for some time and the

decision to find new headquarters was reached about two years ago, after the question of location had long been under advisement and the other considerations connected with the change had received attention commensurate with their importance. Finally it was concluded to build a structure of the size necessary for the press rooms, composing rooms, offices, etc., required in a publishing business, in the neighborhood of the new Grand Central station, the new Pennsylvania Railroad station and the United Engineering Societies Building. The present site was therefore selected and the erection of the "Thirty-Ninth Street Building" was completed. We believe the location a convenient one for visitors from out of town, who, with those from New York, will be welcomed at our new offices.

Voltage Regulation for Car Lights

The generally acknowledged inefficient lighting of interurban cars has resulted within the last few years in frequent attempts to devise voltage regulators. These devices are intended to maintain a constant voltage on the lamps with a variation of line voltage of about 50 per cent, to require practically no attention on the part of the car inspectors and to be so designed that they can be put on the market at a comparatively small cost. The Patent Office records show the issuance of patents for various devices intended to fulfil these conditions. In several instances they contain a solenoid which is connected across the line and whose armature cuts in and out resistance in series with the lamps. In others a motor generator of small size is used. Still a third method is to use a storage battery or storage battery booster when the voltage gets too low. Devices of this type have been tried on cars, but for some reason or other they have not been generally adopted. Their fault evidently lies either in their inability to maintain the voltage constant or in their liability to get out of order. The subject does not possess the same importance on city roads, because owing to the shorter distances of transmission the voltage is more constant.

We believe the value of properly illuminating interurban cars, and city cars as well, where there are variations in voltage, has been underestimated by both inventors and railway men, otherwise there would have been more improvement in this respect. If necessary, the quality of cheapness in installation and maintenance can be subordinated to that of efficiency. The longer the ride at night the greater the necessity for good lighting and no lighting is really good unless it permits the passenger in any part of the car to read his newspaper with ease. During the last six years the interurban car has been improved in so many other respects, so far as comfort in traveling is concerned, that proper illumination is worthy of attention, even if it costs slightly more than the usual arrangement of lamps.

Dispatching and Curves

Every electric railway operator should think long and seriously about a wreck such as that reported as happening recently on an interurban line in the Middle West. From the newspaper descriptions several causes contributed to bring about the collision. A misunderstanding of signals only most probably would have resulted in no more than the cars meeting between switches and one car being compelled to back to the nearest siding had there not been a sharp curve at the critical point. The newspaper accounts may be in error regarding the details of the disaster, but there are systems with lax dispatching rules, and many have curves where it is impossible to see the track a sufficient distance ahead to avoid an accident should the usual methods of dispatching permit cars to meet on these curves. The managements of the larger interurban systems, and we feel safe in saying the majority of those of the smaller roads, appreciate the importance of systematic dispatching. This should be universal. But if there is carelessness or lack of discipline in the office regarding dispatching, it is safe to say there will be greater carelessness among the men. A railway system may be run with lax methods for years without serious accident, and during this time the cars may be gotten over the road with fewer delays and at less cost than would otherwise be the case. But sooner or later the inevitable will happen, and the road will be far worse off both financially and with regard to its reputation for safety than it would have been if system had been observed. The only road that can be operated without careful dispatching is one operating one car only.

In the construction of roads the increased liability to accident due to curves is not usually given the consideration it deserves. Money is not always plentiful when a road is being built, and there is often great temptation to save a few hundred dollars here and there by putting in sharp curves and going round hills rather than through them. Where blind curves cannot be avoided on a single track line it is sometimes possible to double track the curve.

Unfortunately those operators and managers of interurban properties who appreciate least the importance of building their line straight are often the ones who are likely in the operation of their road to appreciate least the value of adopting careful methods of operation.

Adjustment of Accident Claims

Electric railway companies have different ideas as to the proper conduct of their claim departments. Some manifest a tendency to carry all contestable claims to the courts; some make an effort to settle promptly all such claims, while stoutly opposing all suits where the company is clearly not at fault. Still others are ready to pay out a small amount for almost any injury caused by the operation of the cars, whether the company is strictly liable under the law or not, provided there is no suspicion that a fraudulent demand is being made against the company. The argument advanced in favor of this policy is that if the case should come to court the true state of facts might be misunderstood by the jury, or at any rate by the public at large, and thus the company would create an antagonistic feeling against it, even if it was not mulcted for a large sum as

damages. There are of course also all gradations of policy between those already outlined, but in the main it may be said that each claim department, tacitly or otherwise, adopts one of these general principles of procedure in the conduct of its business.

We think all will agree that local conditions have a large bearing upon the proper plan to pursue. For instance, if the community in which the road is located is an intelligent one and the rights of a corporation under the law of negligence are usually construed in a fair way, a different policy can be followed than where every man's hand, figuratively speaking, is raised against the company. Again, in a small city it is often much more easy to investigate the standing of the plaintiff and keep track of the witnesses in an accident case. All will assent also to the general doctrine that "every case should rest upon its merits." It is impossible, or rather highly undesirable from an economical standpoint, to adopt any hard-and-fast rule in the conduct of the claim department, probably more so than in any other branch of street railway work, because the field in which the energies of the department are engaged is that of human nature. Nevertheless it is worth while to consider briefly the three main lines of policy mentioned, and draw from experience such lessons as it may suggest.

A case occurred not many months ago upon the line of an interurban railway company in the Middle West where an accident, due to no fault of the company, resulted in injury to several and one fatality. It was shown to the satisfaction of the management that the derailment of the car was due to some spikes placed maliciously on the rail. At any rate there was no defect in the track, and the trucks of the wrecked car, without being repaired in any way, were put in service under another car immediately after the accident. In the face of all these circumstances the company settled practically all of the claims without contesting them in the courts. One reason was the avoidance of publicity, and another was the general attitude of the public toward public corporations. Had the claims been contested it is probable that many would have been allowed, even if no negligence was shown, because of the general antagonistic feeling of the community to public corporations. No doubt also the final expenses to the company would have been at least as large as they were by pursuing the settlement policy. While the chances are that the company may hereafter be regarded as "easy" and will be subjected to a number of unfair suits, it has benefited in other ways by following the settlement policy mentioned, and the feeling toward the company is now distinctly friendly. This sentiment, while perhaps expensive in the way it was secured, is clearly an asset which is worth having.

In another case, that of a city road, the company had for some time pursued the policy of following up each accident and securing the best release possible in the shortest available time. At the end of the fiscal year, three years ago, the point was raised in the directors' meeting that perhaps this procedure was breeding claims which would not have been made if the company had not shown itself so ready to pay money out of its treasury. At the earnest solicitation of one of the directors, a large stockholder in the company, a waiting policy was then tried, and nothing

was done in the settlement of damages until legal claims had actually been filed. The results of the two policies are instructive and valuable. For the last year during which all cases were looked up quickly and carefully, the average cost per settlement was \$93. For the following year, under the holding back policy, the number of claims was reduced about 10 per cent, but the average cost per settlement increased to \$150, although there were no serious accidents during the year and nothing in the operating records to indicate any reason to expect an increase. In other words, the result showed that although the number of claims fell off, the aggregate cost of making each settlement increased about 45 per cent. It was also found that there were numerous other objections to the waiting policy, not the least of which was the difficulty of keeping in touch with the company's witnesses. In that particular instance the statistics show that about 20 per cent of the company's witnesses disappear from one cause and another between the time of the accident and the trial.

It is quite probable that the first instance cited is somewhat unusual, and possibly neither of them should be considered as precedents in the case of other companies differently situated. Yet they indicate that there are more ways than one of treating this question, and that the plan of contesting every doubtful claim is not always the cheapest in the long run.

A Plan for the Instruction of Trainmen

It is generally conceded that trainmen are deficient in their knowledge of car apparatus; in fact, their knowledge can often be compared to that of an engineer who knows only enough to open the throttle and to blow the whistle. While we cannot expect to make electrical engineers of trainmen, none will deny that if they had a little theoretical knowledge, a general idea of the equipment and a specific idea of how to take care of emergencies, the cost of maintenance of equipment would be greatly decreased and the delays to traffic would be less frequent. Attempts by individual roads to educate the trainmen are usually too expensive to be adopted, except by the largest roads. In most cases the energies of those who try to organize a course of instruction are absorbed by the time the proper apparatus has been gotten in shape. To conduct an instruction department successfully one man should devote his whole time to it, not so much because all his energies would be required in the actual work of instruction, but if other duties are crowded upon him he cannot keep in the proper frame of mind to make the course interesting for the men. Even if they had a suitable man, very few railways could afford to let one man devote all of his time to instructing men. But suitable men are very scarce, for they must have both practical experience and technical training in addition to natural ability as a teacher.

At present interurban roads from Lafayette, Ind., on the west to Erie, Pa., on the east are interconnected, and soon Pennsylvania will be connected by interurban and city lines to Missouri. This interconnection suggests a new method of carrying out instruction work in the Middle West interurban region in an effective manner, and it could be conducted in the same way in other districts as well. It would cost some money, it is true, but this expense would

be distributed so as not to fall heavily on any one road. The idea might be carried out by a private organization that would take contracts to instruct men and arouse their interest in the equipment or it could be undertaken by a group of railways or by a railway association. It is even possible that some one of the technical universities might take it up. The plan contemplates an instruction car or probably a train of them in charge of an instruction crew, consisting of both technical and practical men. Part of the car should be fitted up after the manner of those test cars which have been built for technical universities, so that all of the apparatus could be gotten at and so that measuring instruments could be placed in all of the circuits. In addition, the working parts of the most common electrical apparatus could be shown in sections. The brake equipment should be given almost as much attention as the electrical equipment.

In combination with the work a text-book particularly adapted to men handling the cars should be prepared. This book would deal very lightly with theory and only so far as would be required to give the practical man the basic ideas of the apparatus he was studying. The text-books would be purchased in quantities by companies and supplied to the men. The instruction or school train would make periodic visits to each system and the test apparatus would be used to demonstrate the statements in the book. The instructor would, of course, amplify on the statements in the book and explain them fully. He would also conduct examinations, either oral or written, at each visit, on certain portions of the book. By having the instructor grade the men according to the manner in which they passed the examinations and having the companies reward them in some manner for high standing, without doubt an incentive to study would be produced.

All of the work would have to be conducted in such a manner as to prove not only beneficial, but interesting to the men. The practical demonstration of statements in the instruction book would doubtless conduct to this end. For instance, the statement that to throw off the power with a drum type controller slowly creates a long arc and risks burning the controller might be demonstrated by having a controller with a mica cover so as to show the relative arcs produced when the handle was thrown around quickly and slowly. Again, the excessive current put through the motors by throwing the power on too rapidly could be shown by instruments. A watt-meter could be used in connection to show the waste of power with too rapid starting. Experiments showing that rolling friction is greater than sliding friction would interest almost any man, and after he understood this fact no doubt the number of flattened wheels would be decreased greatly.

One great advantage of such a system of instruction as outlined would be that the expense to each road, if it were inaugurated by a combination of systems, would be so small that costly and elaborate apparatus could be installed in the car. And, too, as the instructor would be occupied practically all of his time in teaching men, he would become very proficient in his work and would soon discover methods of instructing the men and of making the work interesting that could not be put into use by a man who did not specialize in such work.

CONCRETE SHOPS AND CAR HOUSES AT NASHVILLE

In deciding on the location of its new shops and car houses the Nashville Railway & Light Company determined

in fireproof construction and in arrangement for facilitating car repairs. They occupy two buildings facing each other and on opposite sides of Fourth Avenue. Both buildings are of practically the same construction. Concrete foundations support reinforced concrete columns, which carry the loads and between which brick curtain walls are built in. The floors are of concrete and the roofs are of 6-in. concrete slabs covered with five-ply tar paper and gravel. The slabs are supported by reinforced concrete girders. Track openings are closed by Kinnear rolling steel doors, and smaller openings are provided with automatic fire doors. The wiring is in conduit, that for power being embedded in the concrete floors and brought out at the bases of the machines. All of the stairways in the buildings are of iron and the buildings are well lighted by both windows and skylight, and artificial illumination is furnished by enclosed arc lights.

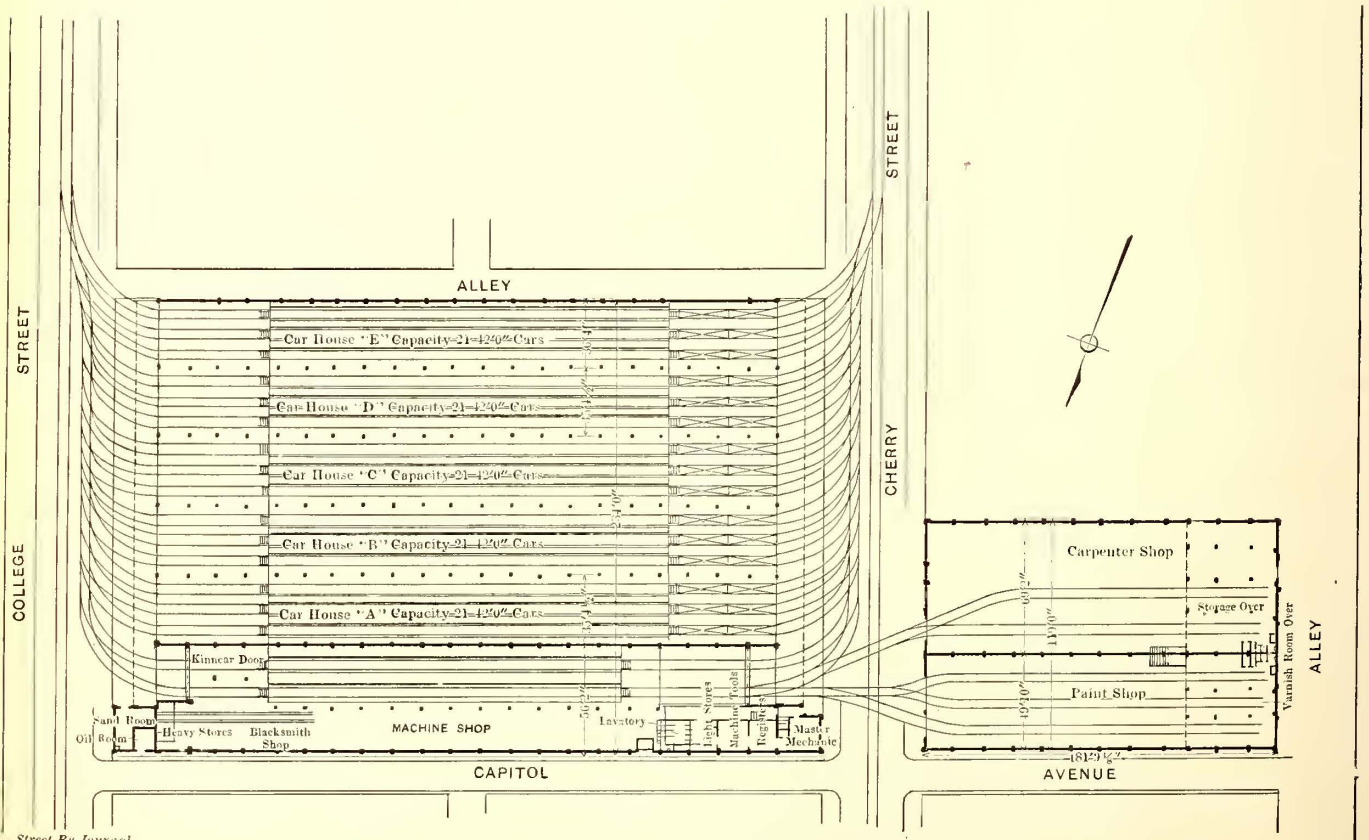


FOURTH AVENUE FRONT OF CAR HOUSE AND SHOPS

that the expense of the dead mileage with the car houses located at a point distant from the center of the city would

This contains on the ground floor two repair tracks with machine and blacksmith shops alongside them. The office

The main building, the greater portion of the floor space of which is taken up by the storage tracks, measures 361 ft. by 232 ft. wide. The northern portion, used as a repair shop, is two stories high.



PLAN OF NASHVILLE REPAIR SHOPS AND CAR HOUSE

be greater than the increased investment in property near the center, and accordingly the new structures were located only about one block from the transfer station, the downtown terminus of all of the car lines.

The shops, as built, represent the most advanced ideas

of the master mechanic, rooms for the repair of registers, for machine tools, for light stores and wash room are located near the front of the building, and a sand room and room for the storage of oils are in the rear.

The hot water heating apparatus for both buildings is

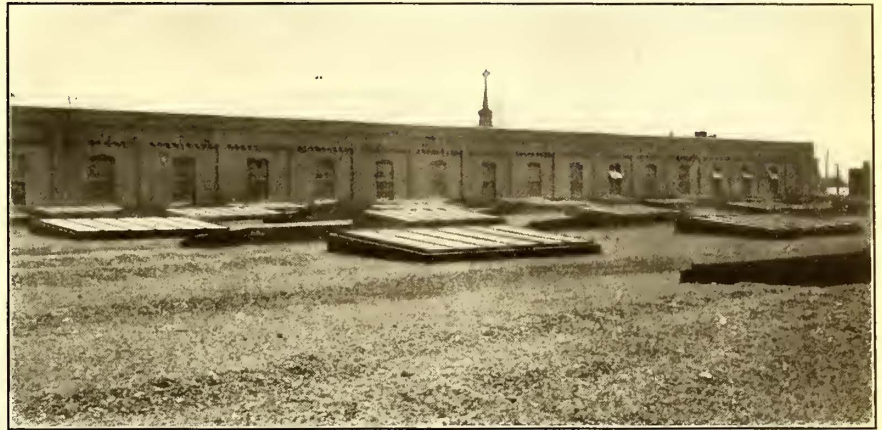
installed in the basement. A motor-driven centrifugal pump forces the water through the radiating pipes, which in most instances are located just under the ceilings. A separate heater is installed in the basement for heating water used in the wash rooms and in washing cars.

The second floor of the repair shop section contains the storeroom and storeroom offices in the forward portion and the winding room in the rear. A 3-ton Otis elevator carries materials to and from the storeroom. The elevator is so located that wagons standing in Capitol Avenue may be unloaded directly onto it.

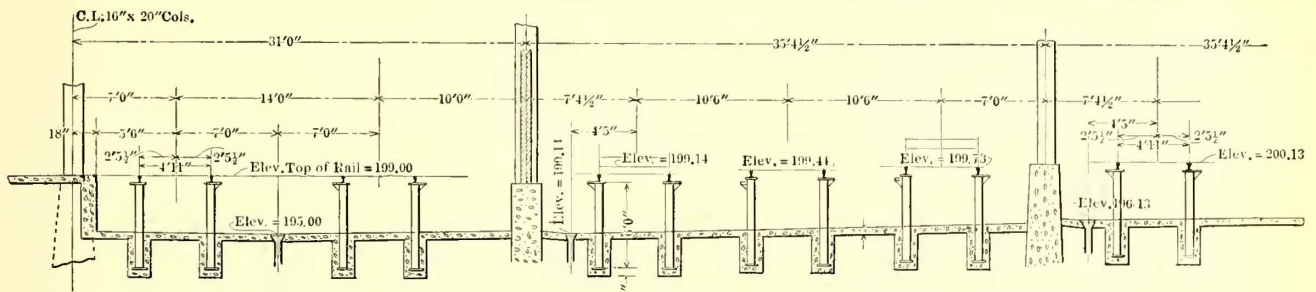
THE MACHINE SHOP

To minimize injury to parts being handled, the concrete floor of the machine shop is covered with a 2-in. wood flooring. The larger machines are all motor-driven by individual 500-volt direct-current or 220-volt alternating current motors. The equipment consists of:

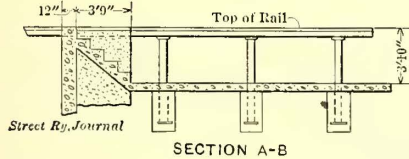
- Bolt cutter and shaper..... 5-hp motor, a.c.
- 24-inch drill press..... 3-hp motor, a.c.
- 24-inch Le Blond lathe, direct-connected to a... 7½-hp motor, d.c.
- 16-inch Le Blond lathe, direct-connected to a... 5-hp motor, d.c.
- 36-inch drill press belted to a..... 5-hp motor, a.c.
- 24-inch back geared shaper..... 5-hp motor, a.c.
- 200-ton hydraulic wheel press direct-connected to a 36-inch wheel-boring machine direct-connected to a Drill grinder, back saw, emery wheel, small lathe, grind stone, belted to a..... 7½-hp motor, a.c.
- 5-hp motor, a.c.



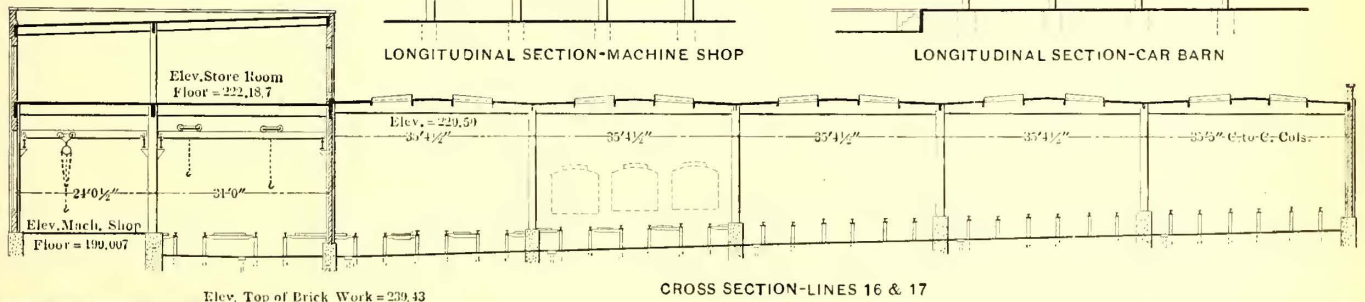
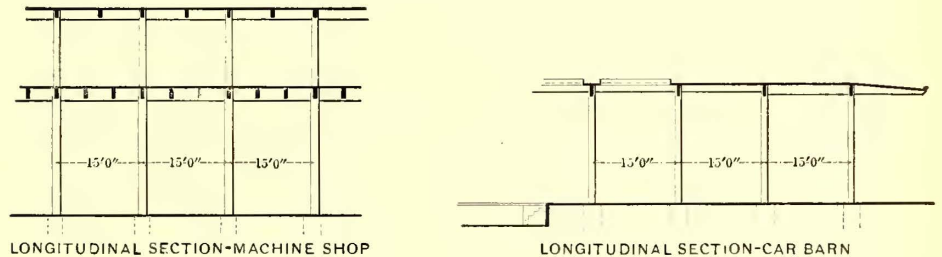
ROOF OF NASHVILLE CAR HOUSE, SHOWING SKYLIGHTS



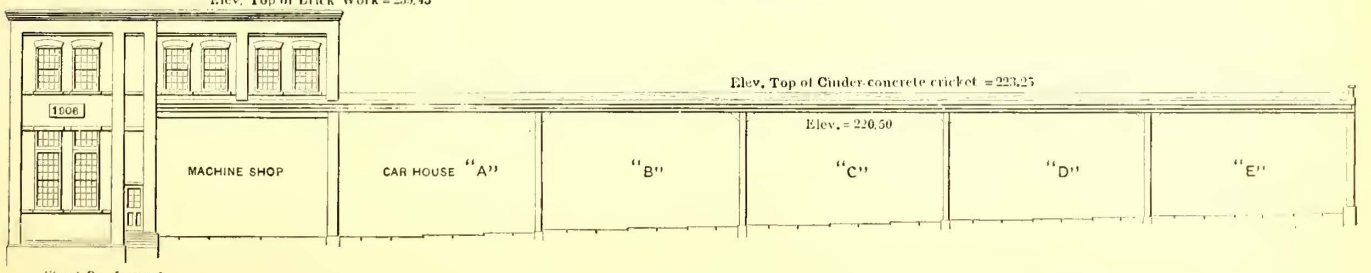
CROSS SECTION PITS LOOKING TOWARD COLLEGE ST.



PIT DETAILS OF NASHVILLE SHOPS



CROSS SECTION-LINES 16 & 17

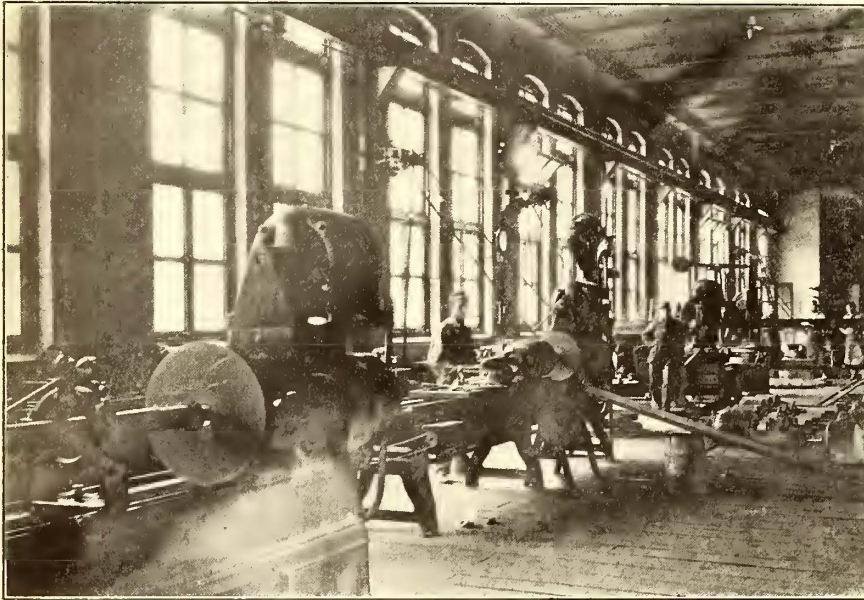


Street Ry. Journal

SECTIONS AND ELEVATIONS OF THE, NASHVILLE SHOPS AND CAR HOUSES

For bench work ten benches are located along the north wall just underneath the windows, and each is supplied with a 6-in. vice. In the blacksmith shop, which comprises a section of the general repair shop in the rear of the machine tools, are installed two Buffalo down-draft forges. The blower and the 24-in. suction fan for the forges are driven by a 5-hp motor.

The rear of the room is used for the storage of wheels



NASHVILLE MACHINE SHOP, WITH INDIVIDUAL DRIVE OF MACHINES

and axles and other heavy materials. A staggered double track extending from the rear to the wheel press facilitates the handling and storage of wheels. The oil room in the rear contains seven 65-gal., self-measuring Bowser oil tanks in which are kept oils and paint materials.

The winding room immediately over the central portion of the machine shop is provided with a 16-in. lathe for banding armatures, and an old 100-ton wheel press is being fitted up for pressing on commutators and armature cores. Armatures are handled by means of a 2-ton electrically-operated Sprague hoist, which runs on an overhead I-beam. This beam extends over an opening in the floor, and the hoist is used to raise and lower armatures from and to the floor below.

For almost their entire length the two repair tracks are supported 3 ft. 10 ins. above a concrete pit on cast-iron posts placed about 6 ft. apart. The posts, which are 6 ins. in diameter, are set in solid concrete approximately 2½ ft. below the pit floor.

The rails are 80-lb. Lorain Steel Company section No. 335, and rest on, and are bolted to, cast-iron heads. The pit extends the full width between the two tracks and several feet beyond the outside rail of each. To get at the sides of the cars provision has been made for the support of a platform between the tracks, but this has not been erected. The floor space at each end of the pit is used in repairing trucks after they have been pulled from underneath the car.

The repair pits are served by two electrically-operated cranes of 8-ton capacity each, built by the Northern Engineering Works. In addition to carrying trucks and heavy pails about the shop, these are used as car hoists, as is shown in one of the accompanying views.

THE CAR HOUSE

The car house or storage shed is separated from the repair shops proper by a brick curtain wall. As the climate is comparatively mild in Nashville, the storage tracks were not closed in at the ends, and, as may be seen from an accompanying cut, the building presents an unusually attractive appearance, which is heightened considerably by the extended roof which overhangs the supporting columns about 15 ft.

The car shed contains fifteen tracks, each with a capacity for seven 42-ft. cars, or the whole car house will shelter 105 cars. All of the tracks are provided with pits, or rather, one pit about 300 ft. long extends under all of them. The pit and track construction in the car house is similar to that in the repair shop. However, the platforms between the tracks have been installed, as is shown in an accompanying reproduction. Cars are washed at the west end of the building, where the concrete floor slopes to drains.

Hose outlets flush with the floor are located between each track. The storage shed is fireproof in the strictest sense of the word, as the only combustible ma-



VIEW SHOWING THE OPEN-PIT CONSTRUCTION IN THE NASHVILLE CAR HOUSE

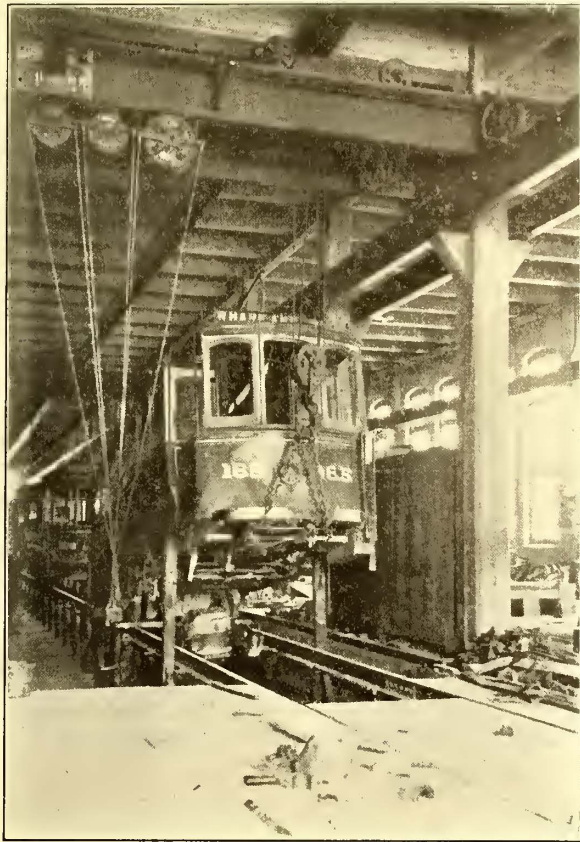
terials in it are in the platforms between the tracks and the wood trolley troughs.

THE CARPENTER AND PAINT SHOP

The building containing the carpenter and paint shop measures 181 ft. 9 ins deep by 119 ft. wide. The two shops are divided by a brick curtain wall. In the rear portion of each is a gallery of concrete construction extending approximately one-fourth of the depth of the building. The

paint shop, which contains three tracks, has a capacity for fifteen cars. All of the tracks are provided with drains, so that the cars may be washed and painted without moving them after they have once been set in the shop. The gallery in the rear is used as a varnish and furnishing room.

The carpenter shop contains two tracks which enter the building through one opening. This opening, as well as the two of the paint shop, is provided with Kinnear rolling



CRANE USED AS CAR HOIST IN THE NASHVILLE SHOPS

steel doors. All of the wood-working tools, which in most instances are driven by individual motors, are located in the south half of the building.

The machine equipment is rather complete, as is shown by the accompanying list:

- Improved resaw..... 20-hp motor.
 - Improved planer..... 15-hp motor.
 - 10-inch molder..... 15-hp motor.
 - Universal woodworker..... 10-hp motor.
 - Cut-off saw..... 5-hp motor.
 - Rip saw..... 7½-hp motor.
 - Tenon machine..... 5-hp motor.
 - Mortising machine..... 7½-hp motor.
 - Molding machine..... 5-hp motor.
 - Band saw..... 5-hp motor.
 - Double spindle shaper..... 7½-hp motor.
 - Sand paper machine..... 3-hp motor.
 - Gang saw..... 10-hp motor.
 - Drill press, grind stone, emery wheel..... 5-hp motor.
- All of the motors are a. c.

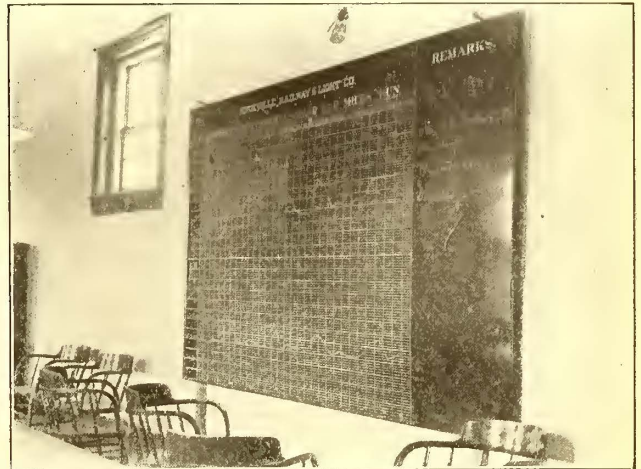
All the wood-working machines were furnished by the J. A. Fay & Egan Company. Along the south wall are located seven workmen's benches. The gallery in the rear is utilized as storage space for lumber.

The master mechanic's office is in the westernmost extension of the two-story section. A stairway from it leads directly to the drafting room immediately above.

The shops were designed and constructed by Ford, Bacon & Davis.

HANDLING TRAINMEN AT KNOXVILLE

The Knoxville Railway & Light Company has adopted several out-of-the-ordinary methods for educating trainmen and encouraging them in their work. T. C. Kelly, superintendent of the railways, has inaugurated the prac-



BOARD IN INSTRUCTION ROOM ON WHICH ARE PLOTTED CURRENT CONSUMPTION AND CAR-MILE CURVES

tice of giving men instructions with regard to the use of current with the aid of a large blackboard chart. This board is erected in the trainmen's rooms at the shop. On

TRAIN ORDER No. _____ 190 ..

Train No. _____ will pass Train No. _____ on siding No. _____ and Train No. _____

_____ on siding No. _____ and Train No. _____ on siding No. _____

Dispatcher

KNOXVILLE RAILWAY & LIGHT COMPANY'S TRAIN ORDER

its tracings are made each month showing the total current in kw-hours used per day, and also the car-miles. A comparison of the two curves and the general instruction given

EMPLOYEES WHO SHOULD BE COMMENDED OR DISCIPLINED		KNOXVILLE RAILWAY & LIGHT CO. INSPECTOR'S DAILY REPORT	
BADGE No.	COMMENDABLE ACTS AND VIOLATION OF RULES	Date	190__ Line _____
		On Duty	On Duty
		Off Duty	Off Duty
		Weather—A. M.	P. M.
			Inspector _____
DEFECTIVE CARS, TRACK AND LINE NOT REPAIRED			
DELAYS AND SUGGESTIONS		ACCIDENTS	
		CAR	MOT. NO. COND. NO. PARTICULARS

OUTSIDE OF INSPECTOR'S DAILY REPORT

has resulted in the motormen appreciating the possibility of wasting current and they have handled the controller more carefully. At any rate, the current per car-mile has decreased considerably since the instruction was begun. Each month Mr. Kelley has a personal talk with all of his

men. These are not for the purpose of criticising, but largely to get better acquainted and to instruct wherein the service can be made better.

The demerit system without the merits is used in pro-

The ratings of the men are changed weekly, the list showing the relative positions being posted on the bulletin board.

Men losing their positions in the list are dropped from their class to the next class below, or to the extra list, depending on what class they belong. Four demerits in thirty days sets a man back.

Delinquencies of men are usually reported by the two inspectors kept on the lines, who report daily to the superintendent on special forms. The reports concerning each man are copied off onto individual discipline reports. This latter report, together with all other papers concerning the man, is filed in a large manila envelope. The face of the envelope is covered with blanks for keeping a general summary of the reports concerning the man.

The company has recently changed its downtown offices and in its new quarters special provisions have been made for the conveniences of trainmen. One room has been fitted up for a general reading room. All of the employees have a club, for which 25 cents per month is charged for membership. The club rooms in the new quarters are provided with a library and facilities for stereopticon lectures.

Form 329-100-1-17
Knoxville Railway & Light Co.
DISCIPLINE REPORT

Motorman		Badge
Demerits	By	FOR
	Month	
		Not using current as per order
		Running car dangerously
		Starting car without proper signal
		Not making regular "stops"
		Passing standing car without stopping
		Not running on time
		Not stopping to take on passengers
		Not sounding gong at dangerous places
		Following another car too close
		Not leaving terminals on time
		Running into open switch
		Stopping car with a jerk
		Sliding wheels when stopping car
		Drinking on duty
		Refusing to run car
		Not reporting condition of car
		Not using hand brake as per order
		Failing to obey schedule orders
		Incurtosity to passengers
		Misling

Remarks

Reported by

Superintendent

Form 329-100-1-18
KNOXVILLE RAILWAY & LIGHT CO.
Motorman's Envelope

Name in full _____
Date Employed _____
Date Discharged _____
Accidents (number) _____

REPORTS

Good Stops or Judgment in Avoiding Accidents _____
Reckless Running in Grades, Curves, Etc. _____
Failing to Stop at Crossings, Etc. (Where Required for Safety) _____
Failing to Stop for Passengers _____
Other Complaints by Passengers _____
Allowing Another Person to Run Car _____
Misled Car _____
Sub or Excess _____
Care of Schedule _____
Miscellaneous _____

FRONT OF EMPLOYEES' RECORD ENVELOPE

DISCIPLINE REPORT

QUARTERLY MEETING OF THE NEW YORK STATE STREET RAILWAY ASSOCIATION

A quarterly meeting of the New York State Street Railway Association, the first since the annual meeting, is announced to be held at Kingston, N. Y., at 10 a. m., Sept. 21, 1907. It will be convened either at Kingston Point Pavilion or on the "Central Hudson," a large steamboat, as may seem desirable at the time. The program is as follows:

MORNING SESSION, 10 A. M.

SUBJECT: Interurban Rules.

REPORT OF COMMITTEE.

John E. Duffy, Supt., Syracuse Rapid Transit Co.

DISCUSSION.

J. R. Harrigan, Asst. Gen. Mgr., Buffalo & Lake Erie Traction Co.

W. H. Collins, Gen. Supt., F. J. & G. R. R. Co.

F. J. Gerdon, Supt., Utica & Mohawk Valley Ry. Co.

W. R. W. Griffin, Supt., Rochester & Eastern Rapid Ry. Co.

J. H. Cain, Div. Supt., Hudson Valley R. R. Co.

AFTERNOON SESSION, 1:30 P. M.

SUBJECT: Collection and Registration of Interurban Fares.

PAPER.

B. A. Frankel, Chief Treas. Dept., Utica & Mohawk Valley Ry. Co.

DISCUSSION.

Jno. G. Phillips, Asst. Gen. Mgr., Hudson Valley Railroad Co.

H. M. Beardsley, Sec. and Treas., Elmira Water, Light & Railroad Co.

N. P. Baker, Div. Supt., International Railway Co.

SUBJECT: Express Rates and Service.

PAPER.

Frank Walsh, Gen. Mgr., Electric Express Co., Schenectady.

DISCUSSION.

C. H. Armatage, Traffic Mgr., United Traction Co.

B. E. Wilson, G. P. & F. A., Rochester Ry. Co.

F. C. Nugent, Gen. Supt., Oneonta & Mohawk Valley R. R. Co.

moting trainmen. The runs are classed according to importance, and the oldest men with the cleanest records are given the best runs. One run which is regarded as the best,

LINE	CAR NO.	RUN NO.	TIME	MOT	H.	COND	NO.	ST	DIRECTION	UNPLUMMED		CONDITION OF CAR	PASSENGERS		
										MOT	COND		ON	WEG	T. P.
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															

CONDUCTOR CALLS				MOTORMAN										
STREET	TRAMWAY	FOURWARD	PLEASE	DIVIDES	PLAS	ALLOWS	CAREFUL	STARTS	RUNS	ON	CAREFUL	BINGS	RUNS	PASSENGER
				WAGES	CROSSINGS	SMOKING		BELL	TIMES	HANDLES		GONG	BY	HOUSE
1														
2														
3														
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11														
12														

INSIDE OF INSPECTOR'S DAILY REPORT

extends out of the city about 6 miles and has the best roadbed and best equipment. It is considered by both the men and the company as an honor to be assigned to this run. The result is that the men in trying to get the best runs render the best service that is possible to be had from them.

The employees of the United Railways Company, of St. Louis, and their families recently enjoyed a three-days outing at Creve Cœur Lake, a resort near St. Louis. The company paid all expenses, including transportation and a barbecue dinner each day. Badges were issued to each employee for every member of his family.

CONTACT RESISTANCE IN CONNECTION WITH RAIL BONDING

Some very interesting experimental work was done on this subject by P. M. Hall, P. C. Smith and C. B. Starbird, members of the class of 1907 at the Worcester Polytechnic Institute, under the direction of Albert S. Richey, professor of electric railway engineering. In connection with the important subject of rail bonding, accurate data are desirable with reference to contact resistance with the effect of time and temperature on the same, the strength and flexibility of different forms of connection, and so forth. To obtain accurate data on all of these conditions affecting the efficiency of the rail-bond would require much more time than was available, and consequently but one phase of the subject was taken up, with the effort to cover that phase as thoroughly and accurately as possible.

To this end, a study of contact resistance was made with special reference to compression bonds. Data were obtained on the contact resistance between steel and copper under different pressures, also on the relation of resistance to the area of contact, and the effect of oxides, oils, etc., between the contact surfaces.

Under the pressures used in compressing the bond terminal into the rail, the copper flows to such an extent that the contact resistance between the steel and copper is very low, and consequently great care must be exercised in its measurement. If the drop of potential method of measurement be employed, quite small currents must be used lest the thermo-electric and heating effects completely destroy the reliability of the tests. This was the method adopted in these tests, using very small currents, measuring the drop of potential across the contact with a sensitive galvanometer.

The apparatus used is shown in the photograph, Fig. 1.

The leads to the galvanometer switch were taken from the test piece as near to the center of the cylinders and the contact area as possible. The galvanometer leads bridged .5 in. of steel, .25 in. of copper and two contact areas on each test piece. To maintain the condition found in practice, that the copper shall not flow freely, a steel band .375 in. thick was placed over the copper disc, covering .0625 in. of the steel on either side of the disc. This band was insulated from the copper and the steel contact pieces.

As it was quite important that the current flowing in the

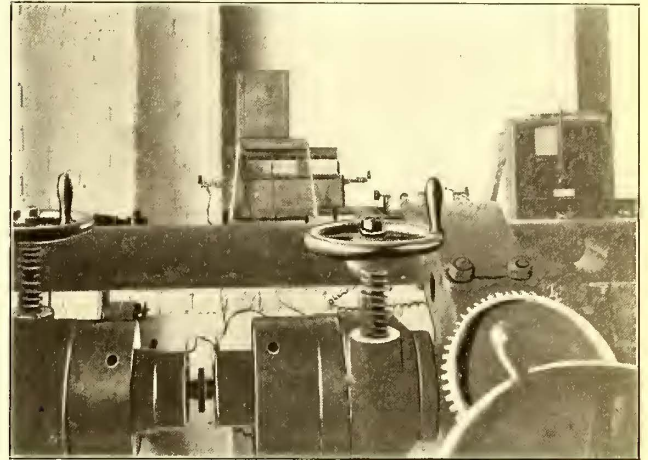


FIG. 1.—TESTING MACHINE

test circuit should be kept constant, the 110-volt supply circuit was cut down to about 10 volts by means of a resistance stand, and a small storage battery of four cells was floated on the 10-volt line. The battery took up the fluctuations on the line, and for further regulation a rheostat of an infinite number of steps was placed in the testing circuit. Then by means of an ammeter the current in the testing circuit was kept exactly constant.

To eliminate errors from thermal effects a small current of 4 amps. was used, and the current was reversed to reverse thermal effects.

The resistance as measured consists of the sum of two contact resistances, the resistance of two pieces of steel and of one of copper. To obtain the contact resistance the resistance of the steel and copper was subtracted. These resistances were measured and calculated, allowances being made for the shortening in length and lessening of resistances under the heavy pressures employed. Curves in Fig. 3 show the compression of the copper with various pressures, increasing and decreasing.

Tests were made on five sizes of discs, varying in cross-section from one to two square inches, the materials being soft-drawn or forged copper, cast copper, and hard-drawn copper. The contact resistance was obtained for each specimen at pressure, increasing gradually from 2000 to 60,000 lbs. per square inch, then being reduced gradually to 2000 lbs. per square inch.

The curves shown in Figs. 4 to 7, inclusive, show in part the results obtained. The dotted line in Fig. 6 was drawn through the points on each curve corresponding to 10,000 lbs. pressure per square inch and shows that the contact resistance varies in a definite ratio with the area of contact.

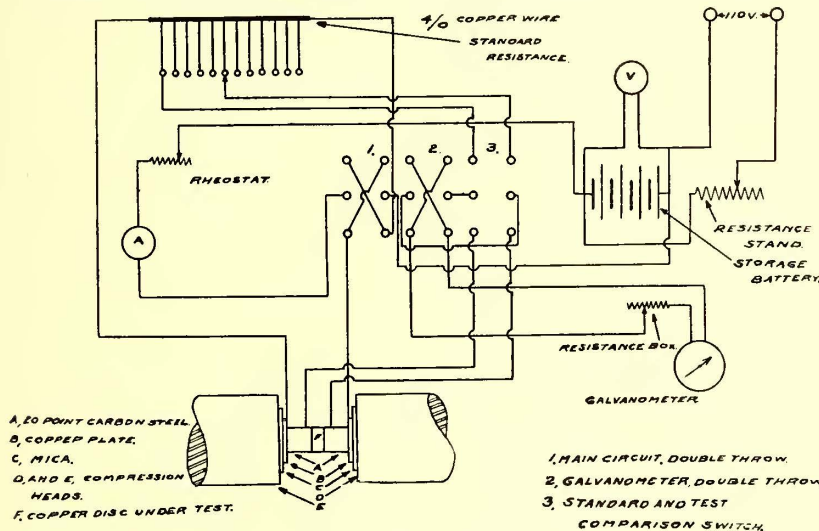


FIG. 2.—DIAGRAM OF CONNECTIONS

and diagram of connections, Fig. 2. The former consisted of steel cylinders 1 in. long, accurately faced on one end, and of copper discs .25 in. thick, accurately faced upon both end surfaces, both discs and cylinders being of the same diameter. These were placed, one copper disc between two steel cylinders and compressive force was applied upon the extremities of the steel cylinders, thus compressing the copper against the steel and forming two areas of contact. Current was sent across the contact areas by a circuit connecting to the extremities of the steel cylinders and pressure was applied by means of an Emory hydraulic testing machine of 100,000 pounds capacity.

Figs. 4 and 5 are specimen curves of individual tests on soft-drawn and cast copper respectively. An interesting feature brought out in all of these individual tests is the difference in resistance values between increasing and decreasing pressure. This is clearly exhibited in these two curves.

Tests were made with oil, soap suds and soda water between the contact surfaces, these substances being those usually employed in drilling the rail to receive the bond terminals. Averaging the values obtained in the tests with oil, the resistance of contact for bright surfaces is .00000052 ohms, and for surfaces coated with oil .0000009 ohms. This shows a slight increase of resistance when oil is used. With soda water the average resistance for bright surfaces is .00000104 ohms, and for surfaces coated with soda water .00000113. This also indicates a slight increase of resist-

to the ends of the bond terminal. The 25,000 to 30,000 lbs. is the pressure which must be exerted along the diameter

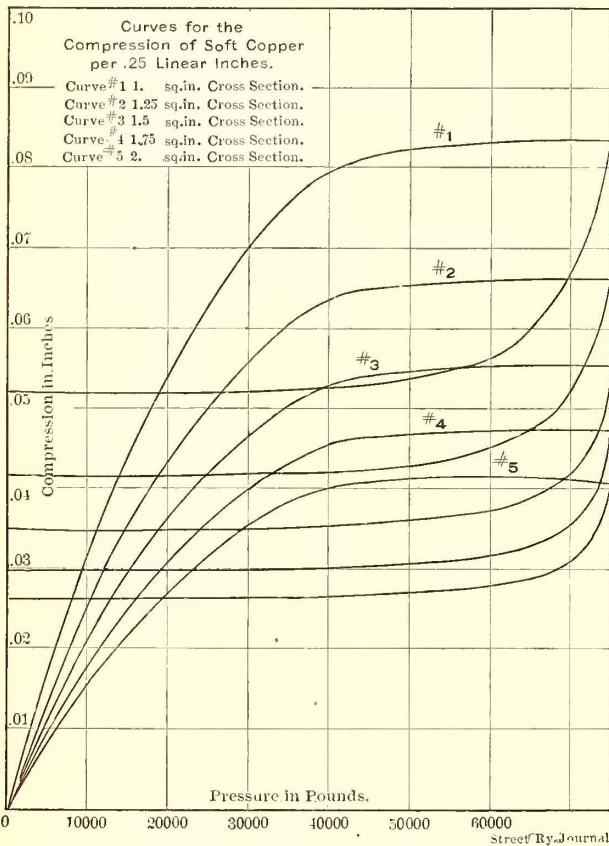


FIG. 3

ance. With soap suds the average resistance for bright surfaces is .00000068 ohms, and for coated surfaces .000000505 ohms, a decreased resistance.

A large number of these individual tests was made, and it is by a comparison of the complete set of curves that conclusions can best be drawn. The general shape of the contact resistance pressure curve is the same for all classes of copper used.

One of the objects of this series of tests was to determine the pressure of the rail-bond against the steel rail which gives the best resistance value. This pressure was found to be from 25,000 to 30,000 lbs. per square inch of contact surface. This pressure is within the elastic limit of steel, and consequently the steel does not take a permanent set when it is applied. It would be inadvisable to exceed this pressure very much because the elastic limit of the steel would then be exceeded and the value of the bond-joint destroyed. This pressure of 25,000 to 30,000 pounds is from 6000 to 10,000 lbs. lower than the pressure which must be applied

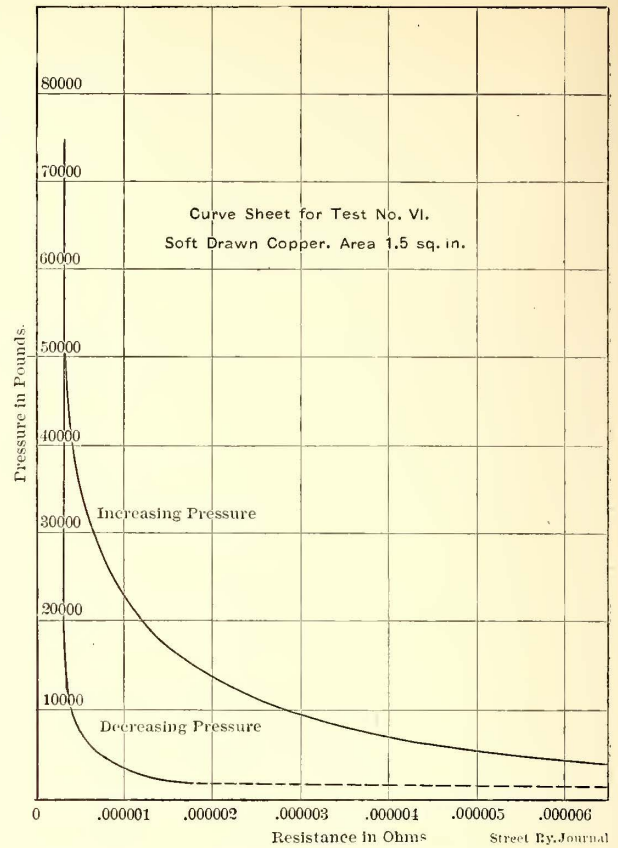


FIG. 4

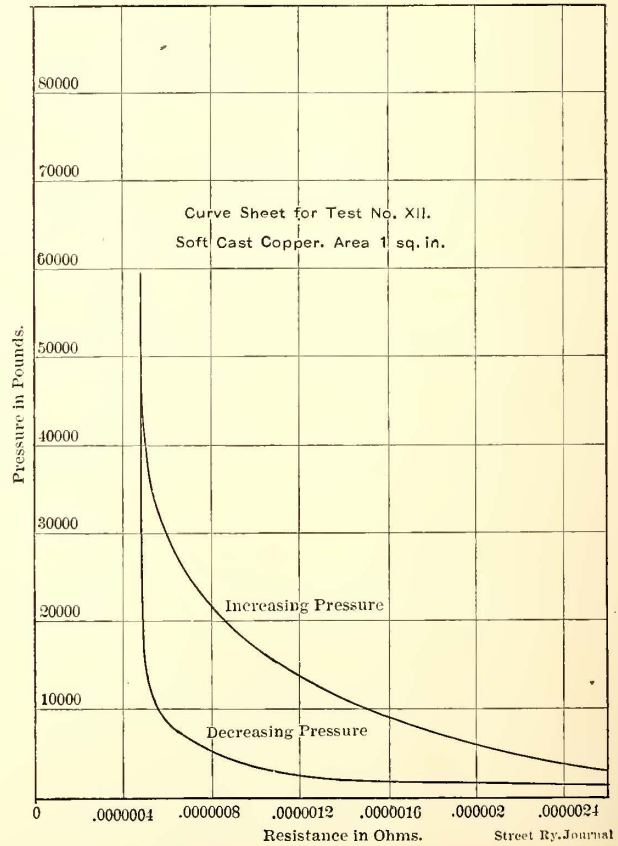


FIG. 5

of the bond terminal, the extra pressure applied to the ends of the terminal being necessary to keep the copper in a flowing state.

From the series of tests made it may be said that it does not pay to increase the area of the bond terminal unless the pressure applied to the bond terminal is correspondingly increased. That is, if the contact surface of the bond terminal is doubled, it is necessary to double the pressure applied to the bond before any appreciable difference of contact resistance is obtained.

Another point determined from the results obtained was, that the contact resistance between annealed cast copper and steel was from 30 to 60 per cent higher than the resistance between annealed rolled copper and steel. It is believed that the porosity of the cast copper is largely responsible for this wide difference in contact resistance. It might be well to state that the cast copper specimens used in these tests were made from stock cast at the institute foundry where very little cast copper work is done. Probably if specimens of cast copper had been obtained from some company which makes a specialty in this class of work, the large increase in contact resistance would have been somewhat lowered.

The tests made in the hard-rolled copper are not of very great importance because in practice the copper should be annealed in order that it will flow more easily.

The data secured with the surfaces coated with liquids, which are generally employed when drilling the rails, show

not take place. According to this opinion, it is advisable, therefore, to use a little oil in the joint, so that the oil will fill the small cells in the steel which the copper fails to

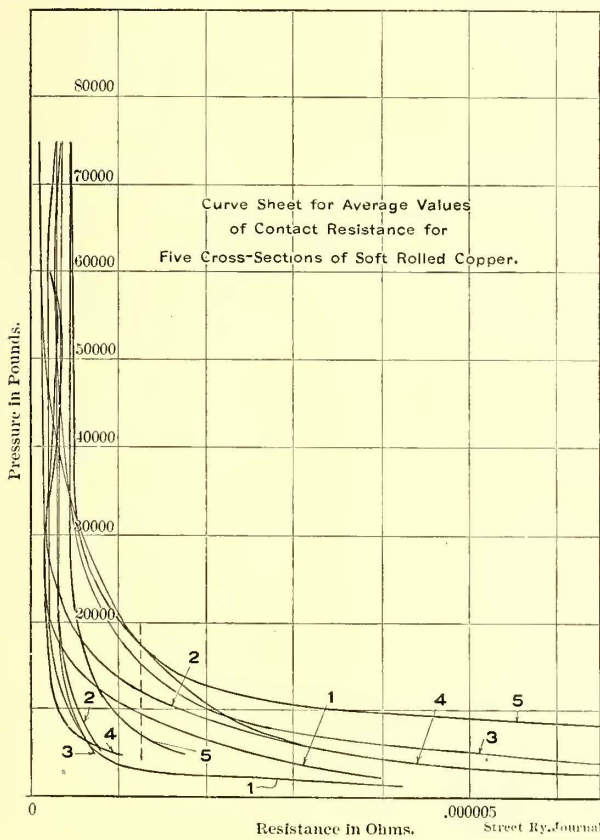


FIG. 6

that there is an appreciable increase of resistance with oil, while with soda water and soap suds the change of resistance is very slight. These results would tend to show that it is better to use soap suds or soda water when drilling rather than oil, but opinion has been expressed to the contrary, for the following reason: After the joint has been made, there will be some liquid left on the contact surface. If the liquid is soda water or soap suds there is a possibility of corrosion if the air should come in contact with the moisture, while if the liquid is oil, the corrosion could

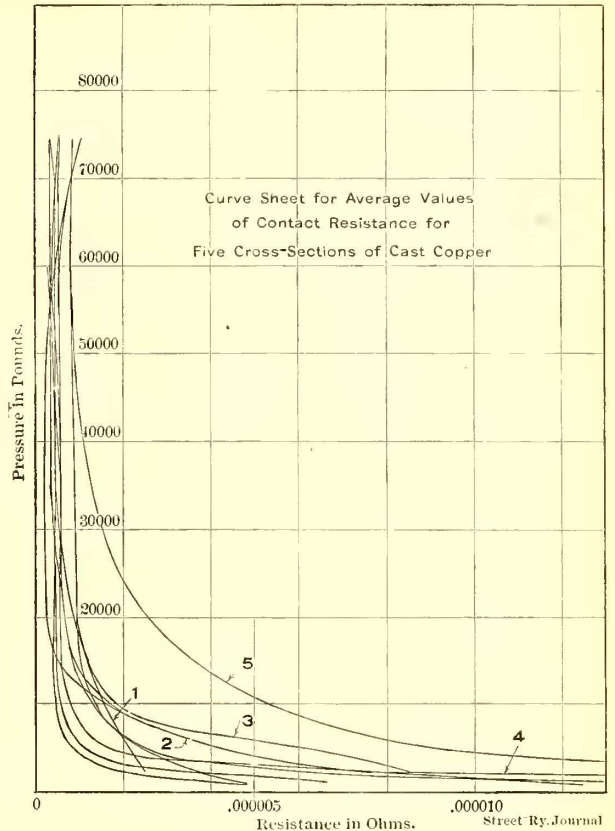


FIG. 7

fill and thereby prevent the entrance of air and moisture to these cells after the joint has been made for some time.

GERMAN ENGINEERS ON TOUR OF INSPECTION

The decision of the Prussian Government to electrify the Berlin Stadt- und Ringbahn has led to the appointment by that government of a commission to study the applications of electricity to heavy electric traction conditions in this country. This commission reached this country Aug. 27 and has already inspected the New York Central, New Haven and Long Island installations in New York, the Boston subway and elevated systems, the General Electric Works at Schenectady, and the Erie electrification at Rochester. The party has also visited Niagara Falls and Pittsburg. It was to leave that city on Sept. 11, for Indianapolis, Fort Wayne, Chicago, Toledo, Helena, where it was to investigate the high tension distribution system in operation there, and Spokane. After leaving the Pacific Coast the party expects to go to Mexico to inspect the Necaxa and other high-tension transmission lines.

The chairman of the commission is Herr Geheimer Baurat Wittfeld, of the Ministry of Railways, Highways and Bridges (Offentlichen Arbeiten). Associated with Mr. Wittfeld and accompanying him on the trip are: Dr. Ing. Walter Reichel, professor at the Berlin Polytechnic School and formerly chief engineer of the railway department of the Siemens & Halske Company; Frederick Jordan, general manager of the Felton Guillaume-Lahmeyer Works of Frankfort; Emmerich Frischmuth, engineering director of the Siemens-Schuckert Works of Berlin, and Baumeister Phillip Pffor, manager and chief engineer of the railway

department of Allgemeine Electricitaets Gesellschaft, of Berlin.

The cost of equipping and operating the Berlin Stadtbahn electrically, estimated by Dr. Reichel, was published in the STREET RAILWAY JOURNAL for Aug. 3. According to the Berlin papers, Minister Breitenbach, of the railway department, has made public the plan decided upon, which is to divide the system of 366 miles into two sections, one to be electrified by 1913, the other by 1920. The single-phase system, with 10,000 volts on the trolley wire, will be used.

SUPERHEATING STEAM

BY W. H. BOOTH.

In superheating, there is, per se, nothing mysterious. The chief trouble is that efficient superheating can only be obtained where the gases will from time to time be hotter than the superheater tubes can endure for very long at a time. The superheater must, in brief, be exposed to temperatures it is not fit to bear for an indefinite period. Engineers must put up with the conditions and must choose between the means offered them for circumventing the more virulent. And so they must learn to combine the factors of first cost, the probability of average reasonable gas temperatures and the amount of temperature control they can get with the conditions of the case.

The actual steam economy due to the use of superheated steam will not vary much with the method and apparatus of superheating. Given a superheat of 100 degrees, it matters little how it is obtained, so far as regards the economy of steam. The fuel economy is altogether a different matter, and it may very well be taken that more is paid for an economy than it is worth commercially. But there can be no doubt of the steam economy with superheat. In the case of a recent test by Albert C. Wood, of a Foster superheater heated by blast furnace gas, the steam economy was found to be 16.82 per cent. Here there was no special question of fuel economy, owing to the fuel being a waste product not yet fully utilized.

The plant consisted of four 19 ins. and 31 ins. x 22 ins. cross compound vertical condensing engines, three De Laval steam turbines, two 14 ins. and 24 ins. x 14 ins. Westinghouse single acting compound engines, non-condensing, and six B. & W. boilers 14 ft. wide x 9 ft. high. Two tests were made with steam superheated 8 degrees and 119.6 degrees respectively, the first test, of course, representing fully dry steam.

The steam pressures were 100 pounds and 101.6 pounds, or practically identical at the boilers and 99.9 pounds and 100.8 pounds at the engines.

In each case the vacuum was 22.1 inches, and under these practically equal conditions the economy was 16.82 per cent in favor of the higher superheat. Probably if the comparison had been made with merely saturated steam the economy would have been 20 per cent. The numerous engines and turbines using the steam suffice to show that the result is a good average commercial figure, and one that can be regularly anticipated.

There is, however, a distinction which should be made between economy of steam used by engines and economy of fuel. If an engine shows an economy of heat used, one would expect an equal economy of fuel. We say economy of *heat* advisedly, because it is far too common to speak as we have done already of the economy of steam by weight, whereas superheated steam may contain several per cent more heat per pound than does saturated steam. Let us suppose it contains 8 per cent more heat acquired

from the fuel and that an economy by weight is shown of 20 per cent. What is the heat economy? About 13.6 per cent only, and this is the economy that should be expected of the fuel. Now, the fuel economy may be more or less than this figure, according to whether the heat arrangements of the steam generating plant are good or otherwise.

The coal economy may usually be expected to be something less than the economy of weight of steam, but it is with heat units that the engineer should deal if he is not to confuse his comparisons.

The importance of being able correctly to define the economy derived from superheating is sufficient justification for all the experiments now being made, or that have been made for determining the specific heat of superheated steam or its total heat at different pressures and temperatures. The subject appears to be surrounded with difficulties, and very contradictory figures are being found. It is not really possible as yet correctly to state the heat economy for the use of superheated steam, because nobody seems to be sure of any figure beyond Regorault's value of 0.48. There is, however, some reason to think that a value of 0.55 to 0.65 is not far wrong for modern temperatures and pressures, and the coefficient 0.6 will be a fair approximation pending some really authoritative or unanimous conclusion as to the true values.

ELECTRIFICATION OF THE SOUTHERN PACIFIC SUBURBAN LINES IN OAKLAND, CAL.

Contracts for the electrical equipment of the suburban lines in Oakland, Cal., and vicinity belonging to the Southern Pacific Railroad Company were let last week at the New York office of the company. The equipment of these lines with electric cars has been under consideration by the company for a long time. The service given is distinctly of a suburban rapid transit character, as the lines serve to connect San Francisco with the large residential communities of Oakland, Berkeley and other important places lying opposite San Francisco across the bay. The commuter traffic is confined largely within a radius of about seven miles, and the different roads conducting this service converge at Alameda Mole, where they connect with a line of ferryboats which carry the passengers across the bay to San Francisco. The stations on the suburban lines are located on an average of .4 of a mile apart, and the system, as a whole, is said to do a larger suburban business in number of passengers carried than any other in the country, the Illinois Central suburban lines out of Chicago alone excepted.

The electrical equipment now decided upon will consist of multiple unit trains with from three to twelve cars per train, made up in the usual combination of motor and trail cars. The cars seat eighty passengers each. Eighty motor cars have been ordered and each will be equipped with four General Electric 125-hp motors. Direct current will be employed and overhead catenary construction will be installed. The power station will be equipped with two 5000-kw, 25-cycle, 13,200-volt, three-phase units, the contract for which has been awarded the Westinghouse Machine Company. Parker boilers have been ordered with Worthington condensers and auxiliaries.

The Utah Railway, Light & Power Company has completely remodelled the Tribune Building in Salt Lake City at a cost of more than \$30,000 and is now using it as a general office structure. The company has under consideration the erection of a passenger station to the rear of the office building.

MONTREAL TRUCK AND WHEEL PRACTICE

The Montreal Street Railway Company has installed during the last eighteen months 100 passenger-car trucks, known as the Class 60 bogie. The truck is notable for the simplicity of its construction and is said to have demonstrated its ability to meet the severe conditions under which the road has to operate during the winter months. These trucks were built by the Montreal Steel Works, Ltd., who also furnished the railway's freight trucks, which are known as Class 100. Both types have the wearing parts interchangeable, thus reducing the number of spare parts stocked to a minimum. They are all designed for outside-hung motors.

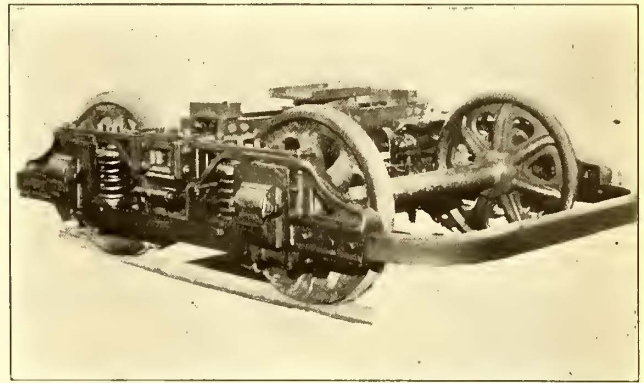
The following table gives the principal data of the Class 60 and Class 100 trucks used:

	Class 60	Class 100
Length of wheel base.....	4 ft. 8 ins.	4 ft. 8 ins.
Length of spring base.....	3 ft. 1 in.
Frame center	6 ft. 0 ins.	6 ft. 0 ins.
Top of rail to top of center bearing.....	2 ft. 7 ins.	2 ft. 7 ins.
Width of bolster	12 ins.	12 ins.
Diameter of wheels	33 ins.	33 ins.
Type of wheels.....	Steel tired with steel centers.	Cast iron.
Diameter of axle	5 ins.	5 ins.
Diameter of journals.....	4 ins.	4 ins.
Length of journals	8 ins.	8 ins.
Wheel gage	4 ft. 8 3/8 ins.	4 ft. 8 3/8 ins.
Weight without motors.....	8,700 lbs.

The Class 60 truck is made throughout of cast steel and standard merchant sizes of rolled steel. The pedestal cast-

rear end is extended to act as a spring seat for the equalizer springs.

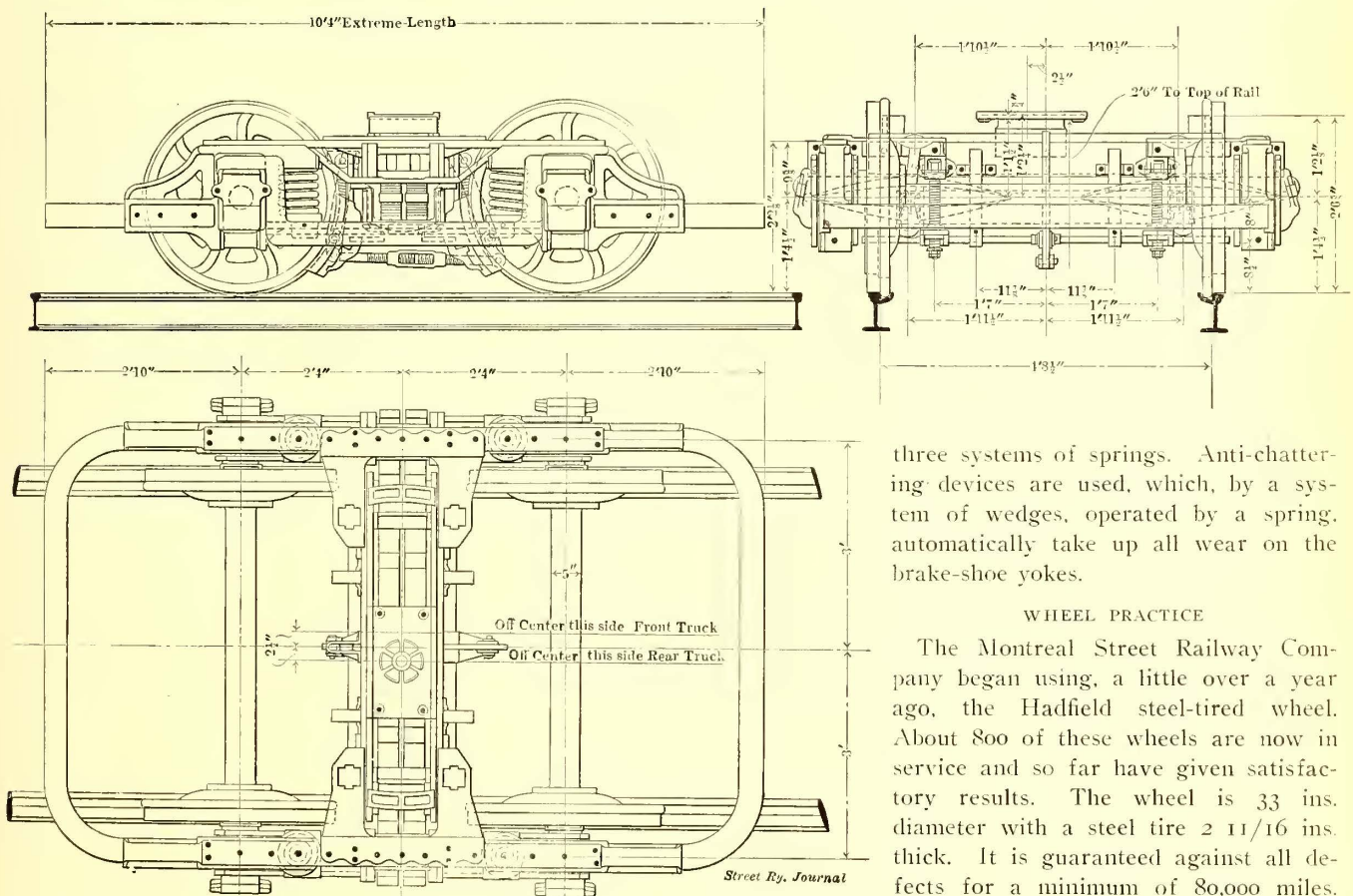
The axles are 5 ins. diameter, of hammered steel, with 4-in. x 8-in. bearings. The journals are of the M. C. B. type, 4 ins. x 8 ins., with bronze bearings and steel wedges.



MONTREAL PASSENGER TRUCK SHOWING THE SIMPLE FRAMING

The bolster is made up of two pieces of mild steel 7 ins x 1 ins. on edge, bolted and braced together throughout.

The spring arrangement is remarkable for the size of springs used, and consists of four spirals 8 ins. diameter, and two elliptic couplets 36-in. centers, with six plates of 4-in. x 7/16-in. steel. These springs have been found to give the car a softer motion than is obtained by the use of



PLAN, ELEVATION AND SECTION OF THE MONTREAL PASSENGER CAR TRUCK

ing is particularly designed to stand the severe strain to which it is subjected, the front end being extended to support the end brace, which is made of extra heavy angle-iron to prevent the truck from getting out of square. The

are figured on before the wheel is scrapped. At present all of the original wheels are still in use, but as the company is watching their behavior with great care the life records, when available, should prove of interest.

three systems of springs. Anti-chattering devices are used, which, by a system of wedges, operated by a spring, automatically take up all wear on the brake-shoe yokes.

WHEEL PRACTICE

The Montreal Street Railway Company began using, a little over a year ago, the Hadfield steel-tired wheel. About 800 of these wheels are now in service and so far have given satisfactory results. The wheel is 33 ins. diameter with a steel tire 2 11/16 ins. thick. It is guaranteed against all defects for a minimum of 80,000 miles. The average cost of re-turning a pair is about 75 cents, and three re-turnings

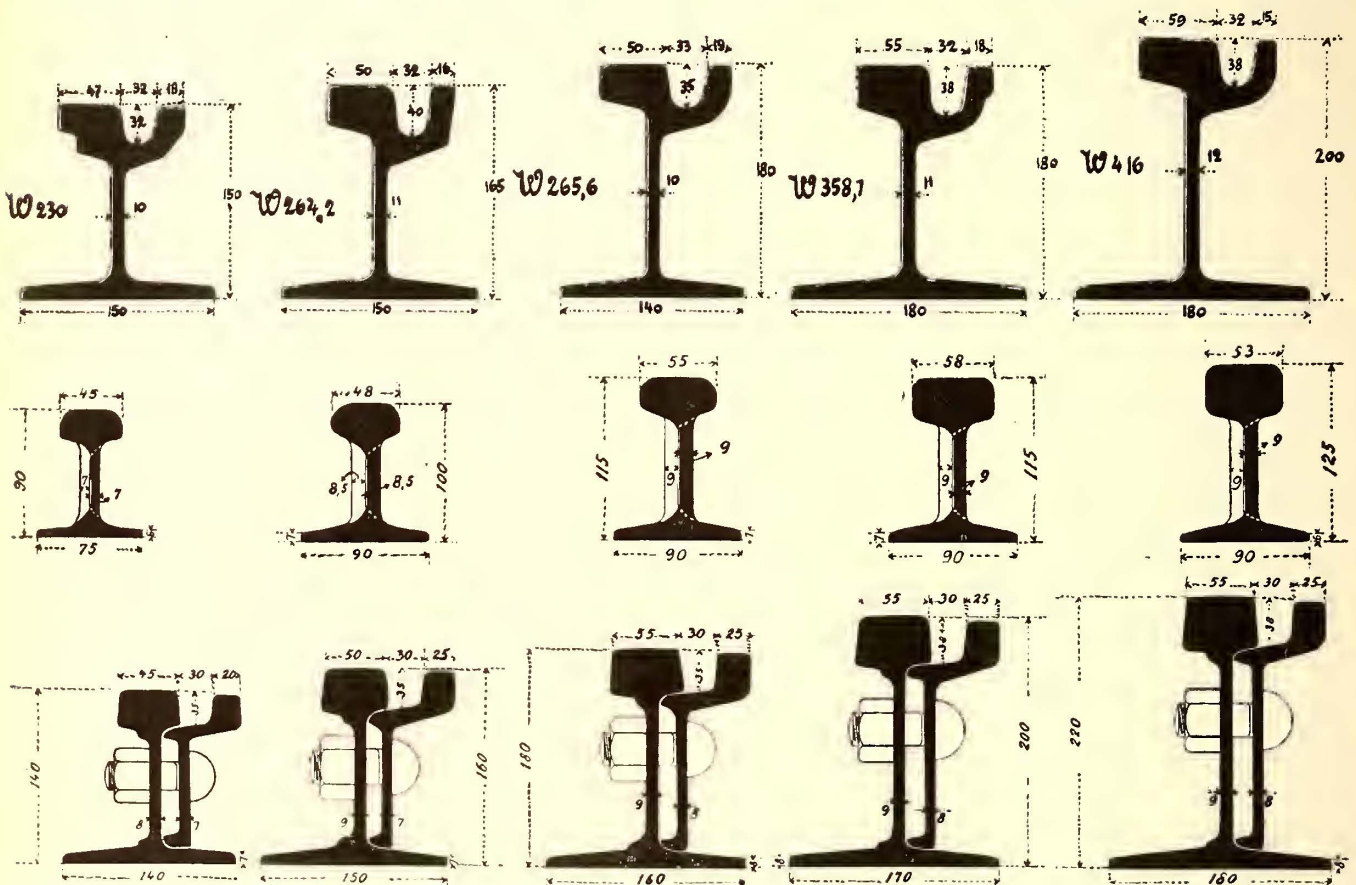
STANDARDIZATION OF RAIL SECTIONS OF THE GERMAN STREET & INTERURBAN RAILWAY ASSOCIATION

One of the important features of the eleventh annual meeting of the German Street & Interurban Railway Association (Verein Deutscher Strassenbahn-und-Kleinbahn Verwaltungen) held at Mannheim, Germany, Sept. 4, 5 and 6, was the presentation of reports on the standardization of rail sections, rail specifications and parts of rolling stock. The report on rail specifications was printed in the STREET RAILWAY JOURNAL for Jan. 5, 1907, and that on rolling stock in the issue of Sept. 7. The report on rail sections follows:

Fifteen sections are proposed for standardization, these

sections best answers service requirements or specifying beforehand the features a standard rail should embody. The first method is undesirable, as it might introduce a great variety of sections. The second method, therefore, is recommended, for no matter what sections are chosen, no great harm will be done, since the rolls for such sections will wear out eventually and then new shapes can be rolled to meet the conditions imposed by additional experience. Besides, in revising such standard sections from time to time it will then be easier to specify minimum weights and profiles for any given load than has been the case heretofore.

The principal points governing the choice of a standard



SECTIONS OF THE GROOVED, TEE AND COMPOSITE RAILS PROPOSED AS STANDARDS FOR GERMAN STREET RAILWAYS. ALL DIMENSIONS ARE IN MILLIMETERS.

consisting of five each for grooved, composite and T-rails respectively and for wheel pressures from two to five tons graded as per table I.

TABLE I

Section No.	Wheel Pressure in Metric Tons.	
	From 2 to 3	Average 2.5
I.	2.5 " 3.5	3
II.	3 " 4	3.5
III.	3.5 " 4.5	4
IV.	4 " 5	4.5

The committee on standardization assumes that the choice of any particular section will be governed by the density of traffic as well as by the wheel pressure.

The grooved rail sections suggested by the standardization committee have been selected with the idea of avoiding shapes that would require radical changes in rolling-mill equipment. In fact, an attempt has been made to select standards from sections now in use. This choice can be made in two ways, either by finding which of the present

rail are the shape of the head (groove, height of head and guard rail), the height of the rail, width of the base, moment of inertia and moment of resistance.

The depths of the grooves of the suggested sections, as given in the illustrations, are sufficient for normal traffic density. A groove up to 42 mm (1.6 ins.) in depth is recommended for very heavy traffic.

Experience has shown that grooved rails should not be less than 150 mm (5.85 ins.) high, but on account of manufacturing difficulties the extreme height is limited to little over 200 mm (7.8 ins.).

If the wheel pressure be expressed by G , the height of the rail h may be expressed by the empirical equation

$$h = \sqrt{8.75 G + m}$$

In which $m = 3750$ mm (146.25 ins.) for light traffic.
 $m = 625$ mm (24.37 ins.) for medium traffic.
 $m = 5000$ mm (195 ins.) for heavy traffic.

From the foregoing values are secured the following rail heights for average traffic: 150 mm (5.85 ins.) for section I; 164 mm (6.4 ins.) for II; 177 mm (6.9 ins.) for III; 189 mm (7.37 ins.) for IV, and 200 mm (7.8 ins.) for V.

The base of the rail should be so wide that the pressure on the foundation does not exceed a certain limit, but on the other hand, paving conditions limit the base width of the lowest section. Hence it is recommended that a 130 mm (5.07 ins.) base should be used for this lightest section. Another limit is presented by rolling-mill conditions, which preclude a base greater than 180 mm (7.02 ins.) in width.

The higher the rail, the wider the base may be without offering obstruction to the pavement. The width *b* may be measured by the equation

$$b = .025 G + n$$

In which *n* = 55 mm (2.14 ins.) for light traffic.

n = 67.5 mm (2.63 ins.) for medium traffic.

n = 80 mm (3.12 ins.) for heavy traffic.

From the foregoing the following base widths for average traffic are derived: 130 mm (5.07 ins.) for section I; 143 mm (5.58 ins.) for II; 155 mm (6.04 ins.) for III; 168 mm (6.55 ins.) for IV, and 180 mm (7.02 ins.) for V.

The moment of inertia must be so chosen that the specific surface pressure on the roadbed does not exceed a given figure. The assumption that this pressure is uniform throughout is not warranted by experience, for the pressure resultants are not normal to the rail base, but more or less oblique according to conditions. Now the less suited the cross-connections between the rails (such as ties) are to take up these horizontal forces, the more unequal must be the influence of the wheel pressure on the roadbed. Nevertheless, a uniform distribution of pressure may be assumed if care be taken that the average surface pressure remain small.

The surface pressure is also dependent on the rigidity of the roadbed and the moment of inertia of the rails. The first usually is expressed by the so-called foundation coefficient *C*, which on street railways should be taken as less than 20.

Now it has been found that the average pressure *p* on street railway foundations with a fairly rigid track where *C* = 20 does not exceed .7 kg per sq. cm. (9.95 lbs. per sq. in.) and further that the rails will remain in place with pressures up to 1.2 kg per sq. cm. (17.06 lbs. per sq. in.). The pressure *p* can be increased in proportion to the increase in the height of the rail and the width of its base, for the pressure distribution approaches uniformity in the same degree and because the greater the wheel pressure the greater the care usually taken to prepare the roadbed.

The committee considered it advisable to give *p* the following values: for light traffic, 1.5 kg per sq. cm. (21.33 lbs. per sq. in.); for medium traffic, 1.2 kg per sq. cm. (17.06 lbs. per sq. in.), and for heavy traffic, .9 kg per sq. cm. (12.8 lbs. per sq. in.).

It is now possible to find the moment of inertia to satisfy the following equation.

$$T = \frac{G^4 C}{64 E b^3 p^4}$$

in which *E*, the modulus of elasticity, is taken at 2,000,000. Then for section I, *T* = 1340 cm⁴ (1340 × .3937⁴ ins.); for II, 2087 cm⁴ (2087 × .3937⁴ ins.); for III, 3036 cm⁴ (3036 × .3937⁴ ins.); for IV, 4068 cm⁴ (4068 × .3937⁴ ins.); and for V, 5298 cm⁴ (5298 × .3937⁴ ins.).

Under the conditions assumed in the foregoing, the moments of resistance become so great that the normal tension remains far below the allowable limit and therefore requires special consideration. If all the minimum values previously derived are assembled, the following table II is secured. To these, the weights of corresponding rails are added for the sake of comparison.

TABLE II

Section	<i>G</i>	<i>h</i>		<i>b</i>		<i>P</i>		<i>T</i> (.3937 ⁴ ins.)	Weight of Rail	
		mm.	ins.	mm.	ins.	Kg.	lbs.		Kg. per m.	Lbs. per Yd.
I.	2.5	150	5.85	130	5.07	1.2	2.64	1340	40	80.
II.	3	164	6.39	143	5.57	1.2	2.64	2087	43.8	87.6
III.	3.5	177	6.9	155	6.04	1.2	2.64	3036	48.6	97.2
IV.	4	189	7.37	168	6.55	1.2	2.64	4068	53.8	107.6
V.	4.5	200	7.8	180	7.02	1.2	2.64	5298	60	120

Table II is a sure and convenient criterion for testing the present grooved rail sections with reference to their availability for particular cases. The sections proposed are given in table III.

TABLE III—Grooved Rails, Class A

Section	Phoenix Section	Height		Width of Base.		Resistance Moment cm ³ (.3937 ³ ins.)	Weight of Rail	
		mm.	ins.	mm.	ins.		Kg. per m.	Lbs. per Yd.
A I.	14b	150	5.85	150	5.85	230	42.4	84.8
A II.	18c	165	6.43	150	5.85	264.2	49.5	99
A III.	25d	180	7.02	140	5.46	265.6	46	92
A IV.	23e	180	7.02	180	7.02	358.7	57	114
A V.	38	180	7.02	180	7.02	416	60	120

COMPOUND RAILS

In general, the points taken up in considering grooved rails apply also to compound rails. The rail heights, however, are derived from the formula *h* = .04 *G* + *m*, and the base from *b* = .02 *G* + *n*, where *m* and *n* are constants for which values are given as follows: For heavy traffic *m* = 60 and *n* = 100; for medium traffic *m* = 40 and *n* = 90, and for very light traffic *m* = 20 and *n* = 80.

The highest pressure per sq. cm. under average load may be derived for the five sections up to 1.2 kg from the formula

$$p = G : 2bL \text{ when } L = \sqrt{\frac{4ET}{bC}} \text{ and } C = 20.$$

In studying the carrying power and stability of compound rails, it is unnecessary to consider the guard rail since the running rail can be used without it. From this, the following table IV is secured.

TABLE IV—Compound Rails, Class B

Proposed Standard Sections.	Wheel Pressure in Metric Tons.	Section No.	Height.		Width of Base.		Weight of Rail.	
			mm.	ins.	mm.	ins.	Kg. per m.	Lbs. per Yd.
B I.	2 to 3	140	140	5.46	140	5.46	44.8	89.6
B II.	2.5 " 3.5	160	160	6.24	150	5.85	36.1	112.2
B III.	3 " 4	180	180	7.02	160	6.24	62.2	124.4
B IV.	3.5 " 4.5	200	200	7.8	170	6.63	67.5	135.0
B V.	4 " 5	220	220	8.58	180	7.02	71.3	142.6

T-RAILS

The following sections are proposed for standard T-rails as given in table V.

TABLE V—T Rails, Class C

Section.	Wheel Pressure in Metric Tons.	Height.		Width of Base.		Weight of Rail.	
		mm.	ins.	mm.	ins.	Kg. per m.	Lbs. per Yd.
C I.	2 to 3	90	3.51	75	2.92	15.8	31.6
C II.	2.5 " 3.5	100	3.93	90	3.51	20	40.
C III.	3 " 4	105	4.09	96	3.74	25	50
C IV.	3.5 " 4.5	115	4.48	90	3.51	27.2	54.4
C V.	4 " 5	125	4.87	90	3.51	28.5	57

It is understood that for these sections, the ties would be spaced 955 mm (37.24 ins.), 965 mm (37.63 ins.) and 970 mm (37.83 ins.), corresponding respectively to rail lengths of 15 m (49 ft.), 18 m (59 ft.) and 21 m (69 ft.).

PROGRAMS OF THE ATLANTIC CITY CONVENTIONS

The programs for the Atlantic City conventions of the American Street & Interurban Railway Association and its three affiliated associations have been announced by the secretary and are as presented below. The meetings of the parent association and of the engineering associations will be held in the Sun Parlor near the end of the Steel Pier. The Accountants' Association will convene in the Chalfonte Hotel, and the Claim Agents will hold their meeting in the St. Charles Hotel. The programs follow:

AMERICAN STREET & INTERURBAN RAILWAY ASSOCIATION.

(Steel Pier.)

Wednesday, Oct. 16, 1907—9.30 A. M. to 1 P. M.

Convention called to order.

Address of Welcome.

President's Address.

Report of Executive Committee.

Report of Secretary and Treasurer.

Addresses by presidents of affiliated and allied associations.

Announcements.

New Business.

Reports of Committees:

(a) Membership.

(b) Compensation for Carrying Mail.

(c) Subjects.

(d) Car Wiring.

(e) Standardization of Equipment.

Paper—"The Technically Trained Man and the Electric Railway Profession," by Prof. H. H. Morris, Cornell University, Ithaca, N. Y.

Paper—"The National Fire Protection Association and Its Work in the Street and Interurban Railway Field," by Ralph Sweetland, Boston, Mass.

Paper—"The Influence of the Design of Railway Structures on Economy of Operation," by H. J. Campion and William McClellan, Consulting Engineers, New York, N. Y.

Thursday, Oct. 17, 1907—9.30 A. M. to 1 P. M.

Appointment of Nominating Committee.

Reports of Committees:

Promotion of Traffic.

Rules.

Heavy Electric Traction.

Paper—"Package Express Business," by P. P. Crafts, General Manager Iowa & Illinois Railway Company, Clinton, Iowa.

Paper—"Freight Interchange with Steam Railroads," by H. H. Polk, President Interurban Railway Company, Des Moines, Iowa.

Paper—"A Department of Publicity," by J. Harvey White, Advertising Manager Boston Elevated Railway Company, Boston, Mass.

Paper—"Advertising from the Street Railway Standpoint," by A. W. Warnock, General Passenger Agent, Twin City Rapid Transit Company, Minneapolis, Minn.

Paper—"The Problems of a Small Road," by H. S. Cooper, Manager Galveston Electric Company, Galveston, Tex.

Paper—"The Use of Tee Rails in Cities," by C. Gordon Reel, Vice-President Kingston Consolidated Railway Company, Kingston, N. Y.

Friday, Oct. 18, 1907—9.30 A. M. to 1.00 P. M.

Reports of Committees:

(a) Insurance.

(b) Rules for the Construction of Modern Car Houses.

(c) Municipal Ownership.

(d) Public Relations.

Paper—"Public Policies of the Past and Future," by C. Loomis Allen, Vice-President Utica & Mohawk Valley Railway Company, Utica, N. Y.

Paper—"Interurban Railway Fares," by Theodore Stebbins, J. G. White & Company, New York, N. Y.

Discussion—"Reduced Fare Agitation."

Discussion—"Depreciation from the Financial and Managerial Standpoints."

Report of Nominating Committee.

Election of Officers.

Resolutions.

Unfinished Business.

Adjournment.

AMERICAN STREET & INTERURBAN RAILWAY ACCOUNTANTS' ASSOCIATION. (Chalfonte Hotel.)

Tuesday, Oct. 15, 1907—10.00 A. M. to 1.30 P. M.

Convention called to order.

Address—John I. Beggs, President American Street & Interurban Railway Association.

Annual Address of President.

Annual Report of Executive Committee.

Annual Report of Secretary-Treasurer.

Paper—"Park Accounting," by Frank J. Pryor, Jr., Comptroller the American Railways Company, Philadelphia, Pa.

Question Box, edited by Frank R. Henry, Auditor United Railways Company of St. Louis, St. Louis, Mo.

Appointment of Convention Committees

New Business.

Tuesday, Oct. 15, 1907—2.00 P. M. to 5.00 P. M.

Luncheon and Social Afternoon.

Wednesday, Oct. 16, 1907—9.30 A. M. to 1.00 P. M.

Joint Meeting with "American" Association (on Steel Pier).

Wednesday, Oct. 16, 1907—3 P. M. to 6.00 P. M.

Paper—"Mechanical Devices for Office Use," by F. E. Smith, Auditor Chicago Union Traction Company, Chicago, Ill.

Report of Committee on "Standard Classification of Accounts and Form of Report."

Report of Committee on "International Standard Form of Report."

Thursday, Oct. 17, 1907—10.00 A. M. to 2.00 P. M.

Paper—"Where Maintenance Ends and Depreciation Begins," by J. H. Neal, Auditor of Disbursements Boston Elevated Railway Company, Boston, Mass.

Reports of Convention Committees.

Election of Officers.

Installation of Officers.

AMERICAN STREET & INTERURBAN RAILWAY ENGINEERING ASSOCIATION. (Steel Pier.)

Monday, Oct. 14, 1907—9.30 A. M. to 12.30 P. M.

Registration at Steel Pier.

Monday, Oct. 14, 1907—2.00 P. M. to 5.00 P. M.

Convention called to order.

Address—John I. Beggs, President American Street & Interurban Railway Association.

Reading of the Minutes of last meeting.

Address of the President.

Annual Report of the Executive Committee.

Annual Report of the Secretary-Treasurer.

Appointment of Convention Committees.

Reports of Special Committees.

Report of Committee on Control Apparatus.

Report of Committee on Maintenance and Inspection of Electrical Equipment.

Tuesday, Oct. 15, 1907—9.30 A. M. to 12.30 P. M.

Report of Committee on Way Matters.

Paper—"Care of Electric Railway Tracks," by George L. Wilson, Engineer Twin City Rapid Transit Company, Minneapolis, Minn.

Paper—"Rails and Joints as Affected by Traffic in New York City," by W. Boardman Reed, Engineer, New York City.

Report of Way Committee on "Rails Corrugation Investigation."

Report of Committee on "Concrete Tie Investigation."

Report of Sub-committee on "Rail and Rail Matters."

Tuesday, Oct. 15, 1907—2.00 P. M. to 5.00 P. M.

Report of "Committee on Standardization."

Report of "Committee on Open vs. Closed Terminals for Car Storage."

Report of Committee on "Operating and Storage Car House Designs."

Question Box.

Wednesday, Oct. 16, 1907—9.30 A. M. to 1.00 P. M.

Joint Meeting of American Association and Allied Associations.

Wednesday, Oct. 16, 1907—2.30 P. M. to 5.30 P. M.

Paper—"Gas Engines," by Paul Winsor, Chief Engineer Motive Power and Rolling Stock, Boston Elevated Railway Company, Boston, Mass.

Paper—"Gas-Engine Operation," by W. W. Cole, General Manager Elmira Water, Light & Railway Company, Elmira, N. Y.

Paper—"Steam Turbines," by St. John Chilton, Engineer, Allis-Chalmers Company, Milwaukee, Wis.

Paper—"Steam Turbines," by August H. Kreusi, Engineer, General Electric Company, Schenectady, N. Y.

Paper—"Double-Flow Turbine," by J. R. Bibbins, Engineer, Westinghouse Machine Company, East Pittsburg, Pa.

General Business.

Election of Officers.

AMERICAN STREET AND INTERURBAN RAILWAY CLAIM AGENTS' ASSOCIATION
(St. Charles Hotel)

MONDAY, OCT. 14, 1907—10.00 A. M. TO 12.30 P. M.

Registration and Badges (at Steel Pier).

Secretary Davis at St. Charles Hotel.

MONDAY, OCT. 14, 1907—2.00 P. M. TO 4.30 P. M.

Convention called to order.

Address—John I. Beggs, President, American Street and Interurban Railway Association.

Minutes of last meeting.

Address of Acting-President.

Annual Report of Executive Committee.

Annual Report of Secretary-Treasurer.

Appointment of Convention Committees.

TUESDAY, OCT. 15, 1907—10.00 A. M. TO 12.30 P. M.

Paper—"The Policy of the Claim Department to the Injured Employee," by R. H. Schoenen, Claim Agent, Lehigh Valley Transit Co., Allentown, Pa.

Paper—"The Claim Agent of To-day and His Work," by H. H. Bennett, Claim Agent, Fitchburg & Leominster Street Railway Co., Fitchburg, Mass.

Paper—"How I Manage Bad Cases," by Harry P. Vories, Claim Attorney, Pueblo & Suburban Traction & Lighting Company, Pueblo, Col.

TUESDAY, OCT. 15, 1907—2.00 P. M. TO 4.30 P. M.

Paper—"Selecting and Training of Investigators and Adjusters for the Claim Department," by Ellis C. Carpenter, Claim Adjuster, Indiana Union Traction Company, Anderson, Ind.

Question Box.

(Three Minutes allowed to each member to discuss a question.)

WEDNESDAY, OCT. 16, 1907—9.30 A. M. TO 1.00 P. M.

Joint Meeting with "American" Association (at Steel Pier).

WEDNESDAY, OCT. 16, 1907—2.30 P. M. TO 5.30 P. M.

Paper—"The Claim Department and What Should Be Done to Make It Effective," by C. B. Hardin, Claim Agent, United Railways Company of St. Louis, St. Louis, Mo.

Paper—"Instructions of Employees in the Work of preventing Accidents," by F. W. Johnson, Asst. Claim Agent, Philadelphia Rapid Transit Company, Philadelphia, Pa.

General Business.

Election of Officers.

As a kind of trade-mark, President Franklin of the Toledo & Western Railroad Company has decided to call his route "The Modern Way," following the lead of some of the steam lines which have adopted such phrases as "The Only Way," "The Comfortable Way," "The Banner Route," "The Educational Route," etc. Three new passenger coaches have recently been received from the Niles Car & Manufacturing Company and put into the limited service between Toledo and Adrian, Mich., and they are proving very popular.

OUR NEW OFFICE BUILDING

As briefly announced in the last issue of this paper, the STREET RAILWAY JOURNAL has moved to its new home in the Thirty-Ninth Street Building, the facade of which is shown in the accompanying illustration. Situated about a half block east of Broadway on Thirty-Ninth Street, the building is within a few blocks of the Times Square subway station and the Sixth and Ninth Avenue elevated stations, and is convenient to Broadway, crosstown and avenue surface lines. Its advantage of easy accessibility will be further increased upon the completion, several blocks south, of the Pennsylvania and McAdoo North River terminals and of the East River Belmont Tunnel, which latter will land passengers at Times Square, three blocks north. An incidental advantage of the location is the neighborhood of the Engineering Societies Building, a block east, with its fine technical library at the disposition of the editorial staff. While the new location is somewhat removed from



THE NEW HOME OF THE STREET RAILWAY JOURNAL

that part of the city where the offices of the STREET RAILWAY JOURNAL have been located ever since the paper was established, the change of location is in accordance with the recent tendency still further to extend the business section to the north in order to profit by the transit improvements under way as already briefly noted.

The building has a frontage of 126 ft. on the north side of Thirty-Ninth Street, with a depth of 98 ft., and consists of eleven floors and a basement. The front is flanked by pavilions which provide for the elevators, stairways and toilets, thus leaving unobstructed the main floors. There are recess courts in the rear of the pavilions, the interior of the building thus being lighted from all sides.

The building is entirely of reinforced concrete and probably the most advanced example of its type in the world. The steel reinforcement of the columns is sufficient in itself to carry the load of the building. The floors, which are formed of reinforced concrete slabs, are carried by reinforced concrete girders of large size and wide span.

These girders and their molded connection with the columns give to the ceilings a symmetrical and attractive appearance which recalls the beamed interiors of European mediæval structures. The external walls are finished entirely in concrete, the front facade having its surface carefully floated. To those who have had doubt as to the appearance of a large facade entirely in concrete it will be an agreeable surprise to know that it is possible to produce an effect with a carefully worked concrete surface as handsome as with the use of the most attractive stone or brick. All the engineering details connected with the construction of the building were in the hands of Prof. William H. Burr, of Columbia University.

Two high-speed electric elevators for passenger service are installed in the east pavilion and one passenger and one freight elevator in the west pavilion. Current for all purposes, lighting and power is taken from the street main. The boiler equipment for heating has a sufficient capacity to furnish steam for power should it become desirable at any time in the future to generate electric current on the premises. At the present, however, there does not seem to be any probability that an individual generating plant will have at any time to be installed.

It is of interest to note that approximately ten thousand barrels of concrete and fifteen hundred tons of steel were used in the construction of the building. Each of the floors of the building has an area of ten thousand five hundred square feet. The offices of this journal are on the eleventh or top floor, where every modern office convenience has been provided. A large printing plant is now in course of installation in the building for the service of the several journals published by the McGraw Publishing Company, and will occupy three entire floors, viz.: The second, third and fourth floors.

A PACIFIC COAST TRACK-LAYING MACHINE

In connection with the article in the Sept. 7 issue of the STREET RAILWAY JOURNAL, on the Pacific Coast

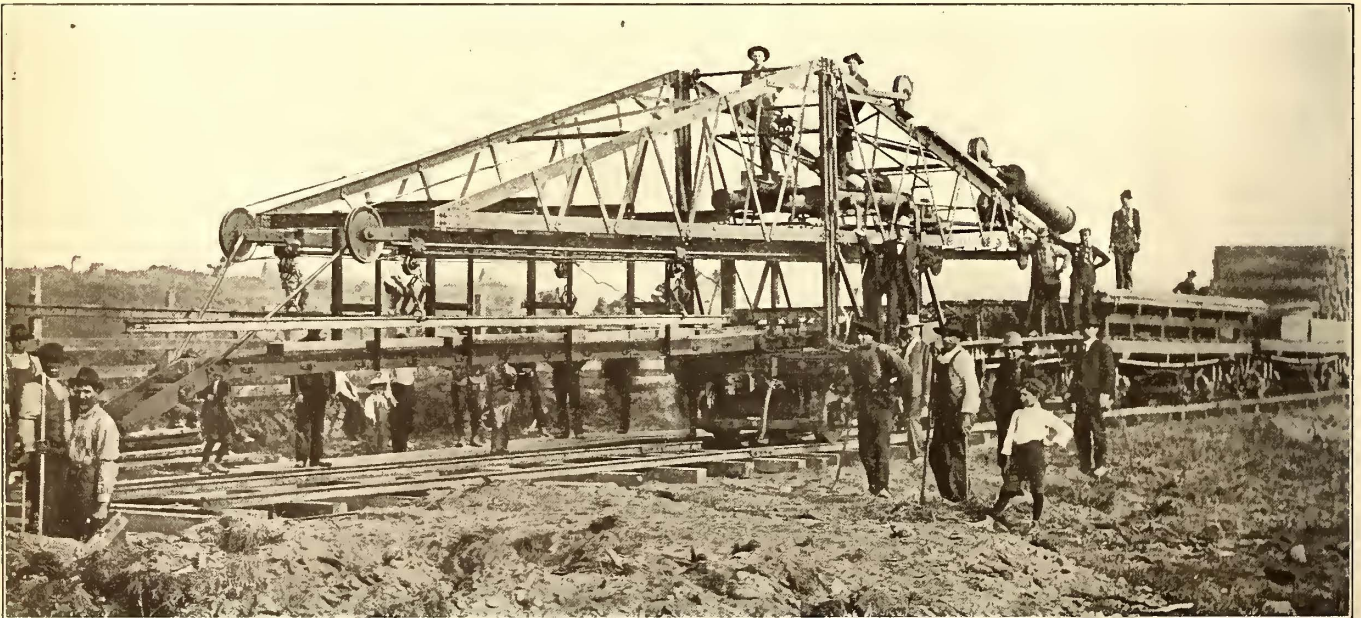
Track-Layer & Manufacturing Company, of Tacoma. As can be readily seen from the accompanying illustration the machine consists essentially of a steel truss mounted on a flat car and provided with the necessary pneumatic hoists and conveyors. The machine handles both the rails and ties; the ties are distributed by hand, but the rails are laid on the ties in position for spiking, by the machine without rehandling. On the Pacific Traction Company's system the machine laid from two to two and a half miles per day with the following crew: Four men to operate the machine and feed ties and rails, four strappers, eight spikers, four nippers, six tiemen to distribute and space ties, one pedler and one foreman. The distinction between this and other so-called track-laying machines is that the handling of rails is totally avoided and the handling of ties reduced to their distribution over one rail length of grade.

CAR CLEANING SANITARY SPRAY

The New York City Railway Company has adopted a new method of cleaning and disinfecting its cars. The compound which is used is called the Gillette Sanitary Spray and is manufactured by the Gillette Chemical Company, New York, of which Col. Giles S. Allison is president. The compound is furnished in any quantity desired and is applied by an atomizer to the floor, woodwork, metal parts, windows, seats and any part of the inside or outside of the car which requires cleaning. The spray lays the dust, disinfects and deodorizes the car, kills all germs and insures good sanitary condition. As a window cleaner the spray is convenient and thorough, a dry cloth being all that is necessary to clean the window thoroughly after the spray has been applied. The spray does not injure the most delicate varnish on either wood or metal.

TRAIN TESTING APPARATUS

Prof. Sydney W. Ashe, of the Brooklyn Polytechnic Institute, has written this paper that through an oversight



TRACK-LAYING MACHINE IN SERVICE ON THE PACIFIC COAST TRACTION COMPANY'S LINES

Traction Company, it may be of interest to add a note on the track-laying machine used during the construction period.

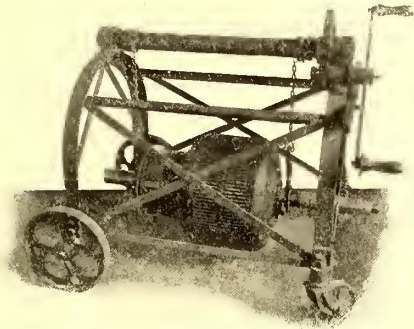
The machine was of local design, built by the Westcott

the connecton of Mr. Keiley with the train testing apparatus described by Prof. Ashe in an article in the STREET RAILWAY JOURNAL for Aug. 24 was not given. The testing set described was based upon one invented some four

years ago by J. D. Keiley, now electrical engineer of the New York Central & Hudson River Railroad Company, but has been changed by Prof. Ashe by the introduction of the various devices described by him in the STREET RAILWAY JOURNAL for Sept. 8 and Dec. 1, 1906, and Sept. 7, 1907.

A SPECIALLY DESIGNED ARMATURE TRUCK

Progress in handling an armature in the shop after it has been removed from the motor for repairs or rewinding is to the repair shop, thence to the banding machine and finally to the armature rack for storage or to the car itself. Thus the armature must cover a good deal of ground and the problem presents itself of how to transport it on account of its weight and delicate construction. The danger of rolling an armature on the floor is fully appreciated and so a truck becomes imperative. The ideal truck should insure the safe transport of the armature without necessitating the services of several men, planks, blocks, etc., for both placing and unloading, as is frequently the



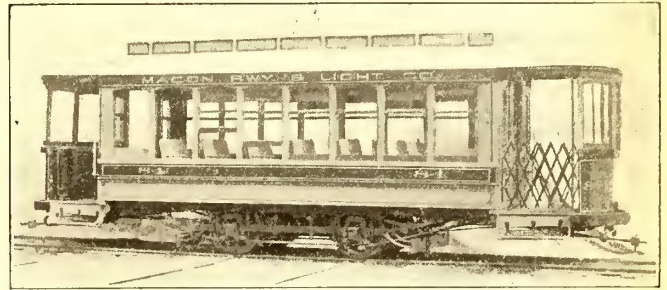
ARMATURE TRUCK

case. A truck designed to move armatures with greatest ease, speed and with no possibility of injury to the armature in any way has been designed by the Device Improvement Company, of Hanover, Pa. It consists of two semi-circular angle steel frames joined by suitable braces. The forward end is provided with twelve-inch cast iron wheels with steel axles joined rigidly to the frame. The rear end has large casters which swing in any direction by means of which the truck is easily steered. A large double thick pipe on the top of the frame revolves on suitable bearings, and forms the hoisting drum around which the chain revolves. The gear wheel is pinned to this drum and meshes with a pinion, which is revolved by the crank. On this shaft is the ratchet and when the armature is elevated to the proper height, four or five inches above the floor, the dog is engaged holding the armature in position. The braces at the forward end run only part way down so that the largest armatures have clearance. On each chain is a forged hook of ample size to take in the largest shafts with boxes. As the armature rests on the floor the truck is pushed over it, the hooks placed on the shaft and elevated, the handles again grasped and the suspended armature wheeled to the desired position.

MACON RAILWAY & LIGHT COMPANY BUYS NEW ROLLING STOCK

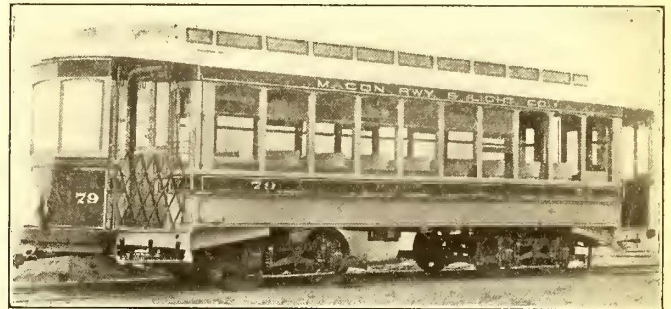
Travel on the Macon Railway & Light Company has been unusually brisk this summer, with the result that new equipment had to be purchased. Since its arrival, however, a marked improvement has been noticeable in the service, especially on the lines reaching Crumps, North Highland

and Ocmulgee Park. The new equipment, numbering ten cars in all, is composed of both double and single-truck Brill semi-convertibles, and the larger cars have proved especially valuable in handling the crowds going to and coming from the amusement parks mentioned, while the window



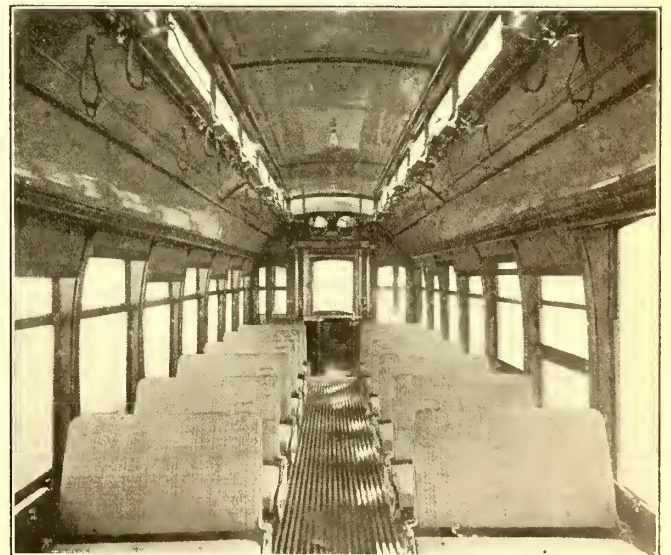
EXTERIOR SINGLE TRUCK CAR FOR MACON

system employed on these cars is particularly well adapted to this class of travel. The Macon Railway & Light Company is a consolidation of all the railway and light companies in Macon, and the new equipment swells the total number of cars operated to sixty-seven. Both types of cars are equipped with the Brill portable vestibule; in fact, the



EXTERIOR DOUBLE TRUCK CAR FOR MACON

cars throughout have specialties made by this builder, including radial draw-bars, ratchet brake handles, etc. Some of the dimensions of the larger cars follow: Length over end panels, 28 ft.; over crown pieces, 37 ft. 5 ins.; width



INTERIOR MACON CAR

over sills, including panels, 7 ft. 10½ ins.; height from floor to window sill, 23 ins.; size of side sills, 4 ins. x 7¾ ins.; end sills, 5¼ ins. x 6⅞ ins. The trucks are the No. 27-G1 with 4-ft. 6-in. wheel base. The smaller cars are 20 ft. 8 ins. in length with correspondingly similar dimensions and are mounted on the No. 21-E single truck.

NOTES ON THE PORTLAND (ORE.) SYSTEM

As now organized the combined lines of the Portland Railway, Light & Power Company, of Portland, Ore., namely, the Portland Railway Company and the Oregon Water Power & Railway Company, make Portland the radiating point for a widely divergent system of railways which is playing a prominent part in the building of a greater Portland. There are seven trains daily between Portland and the suburban communities of Gresham, Anderson, Boring, Barton, Eagle Creek, Currinsville, Estacada and Cazadero, and between Portland and Oregon City there is a 35-minute service. Freight trains are run daily and milk and cream shipments are given passenger-train service. The electric trains of the Oregon Water Power lines have brought a rich agricultural section of Clackamas County into direct connection with Portland at a passenger rate of only two cents a mile with a correspondingly low freight rate.

The company has in the neighborhood of 375 cars, a large number of which have been supplied by the American Car Company, and during the present year will add to its passenger equipment 100 cars. The freight equipment will be increased by the addition of three new electric locomotives and about 50 box and flat cars. Arrangements will also be completed whereby the freight service will be handled entirely by electricity instead of partially by steam as formerly. Additional side tracks and switching facilities are also to be provided. Twenty new passenger cars recently constructed in the shops of the company are now in operation.

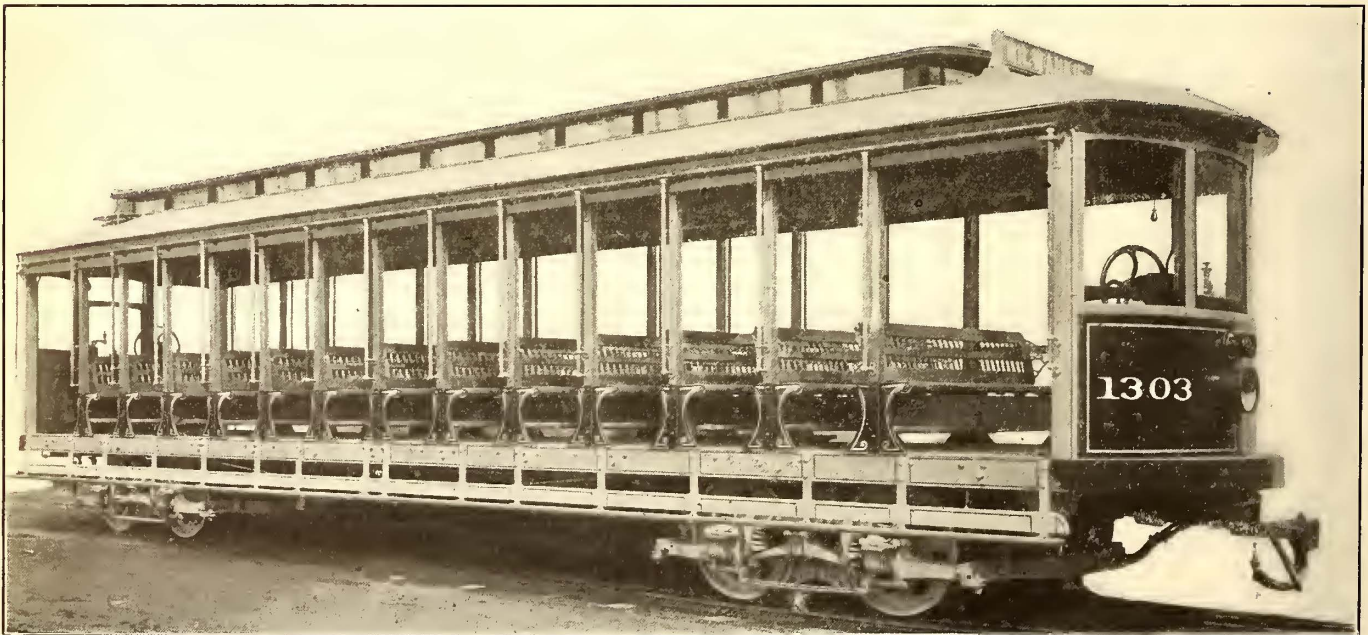
With the completion of the Cazadero power plant described in detail in the *STREET RAILWAY JOURNAL* for May 18, 1907, and the installation of new converting machinery

systems combined, this year, in extensions and betterments, about \$1,250,000.

Another interesting fact is that something like 7300 cars of freight in carload lots were handled over the lines last year. In this work, the telephone plays a very important part, the dispatching of trains being done entirely by telephone. In all, about 95 miles of telephone line are operated. There is now under construction a new dispatching line from Portland to Cazadero, a distance of some 38 miles. Extensions under way comprise about $2\frac{1}{4}$ miles on the Sandy Road line and $8\frac{1}{2}$ miles on the Troutdale division. The country opened up by the latter extensions has been cleared, and the new line should make it an object for the land owners to render it productive.

Extensive improvements under way at Oregon City, about 15 miles from Portland, will improve the service between these points to the extent of making a 30-minute schedule possible instead of the present 35-minute service. One of the most beneficial improvements is the double tracking of The Oaks Line, extending from the south end of what is known as the yacht siding some 8700 feet south of The Oaks, Portland's popular amusement resort, located about 5 miles up the Willamette. This work, requiring a fill of 90,000 yards, was commenced on March 8, and on May 15 was completed with the exception of surfacing a small portion of the track. With the extension and double tracking of the yacht siding from the north end to the Inman Poulson Mill passengers have the benefit of a double-track line from Portland to The Oaks and a superior service than heretofore.

The new cars, 15 of which, of the 13-bench open type, have just been shipped by the American Car Company, are of the closed-end type eliminating the usual bulkhead and permitting all the seats to face in the one direction.



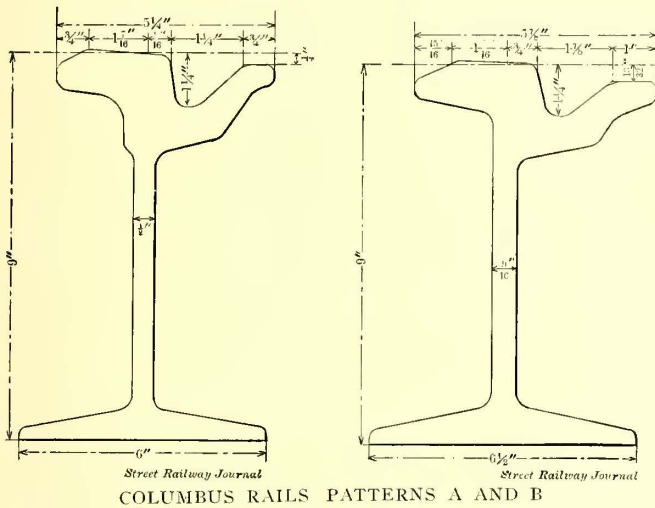
TYPE OF OPEN CAR ADOPTED FOR USE IN PORTLAND

at the various sub-stations, which are now almost completed, the power available will be sufficient adequately to handle the business for several years to come. Among other improvements are a new steel bridge at the Clackamas River and substantial additions to the car barns. About 10 miles of track will probably be constructed and with it will be laid hard-surface permanent pavement in the various business streets on both sides of the river. There will be expended on the standard and narrow-gauge railway

The cars will be operated by the multiple-unit control system. They are finished in ash with ceilings of maple. Following are the principal dimensions of the cars: Length over bumpers, 42 ft. 10 13-16 ins.; width over sills, 7 ft. 6 15-16 ins.; height from floor to ceiling, 8 ft. 1 3-8 ins.; from track to under side of sills, 31 5-16 ins.; the side sills measure 4 1-2 ins. x 7 ins., rabbited to receive 4 ins. x 6 ins. angle; end sills, 4 ins. x 6 ins. plated with 3 ins. x 4 ins. x 1-2 in. angle; sill plates, 7 ins. x 5-8 in.

TWO TYPES OF RAIL APPROVED FOR USE IN COLUMBUS

The board of public service of Columbus, Ohio, has approved two styles of grooved rails, either one of which may be used by the Columbus Railway Company or the inter-urban lines entering the city over improved streets. Pattern A, as shown in the accompanying engraving, was de-



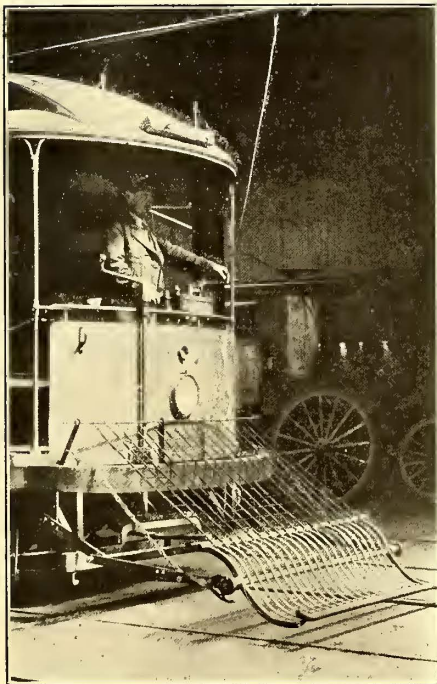
scribed in the STREET RAILWAY JOURNAL on Aug. 24. Pattern B was selected by the board since the publication of that issue, and both were approved by the board Aug. 28. Pattern A, which is known as the Chicago type of rail, must have a weight of not less than 129 pounds to the yard,

city engineer will admit that other types of rail will be approved, but it is understood that upon the advice of City Solicitor Marshall other types are being considered. Mr. Marshall fears that if the electric railways are restricted to one or even two types of rail, they will have ground on which to contest the action of Council and the service board. As matters stand at present, however, the electric lines are required to use one or the other of the rails approved, and official notices to the companies to this effect are being prepared.

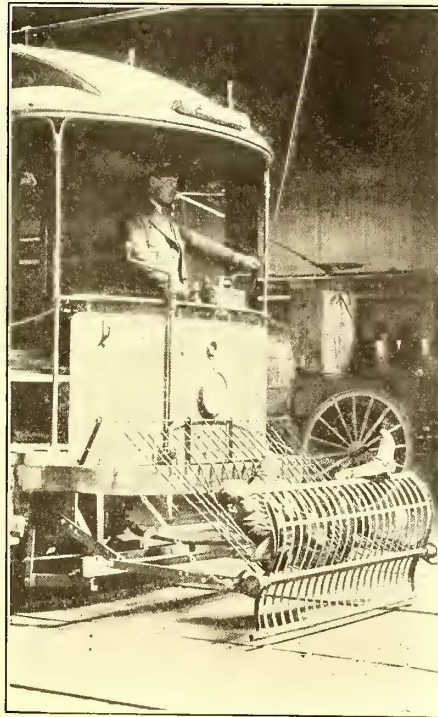
The Ohio Electric Railway Company, it is expected, will contest the order. The company has a precedent in Columbus on which it will probably lay some stress in its fight. The board of public service preceding the present one approved plans for laying T-rail with the special Hayden block paving on the West Town Street line and the work of putting this in is still going on. The city, although it is improving West Town and the laying of the T-rail is in violation of the recent ordinance, has shown no inclination to interfere with that work.

THE WORCESTER FENDER

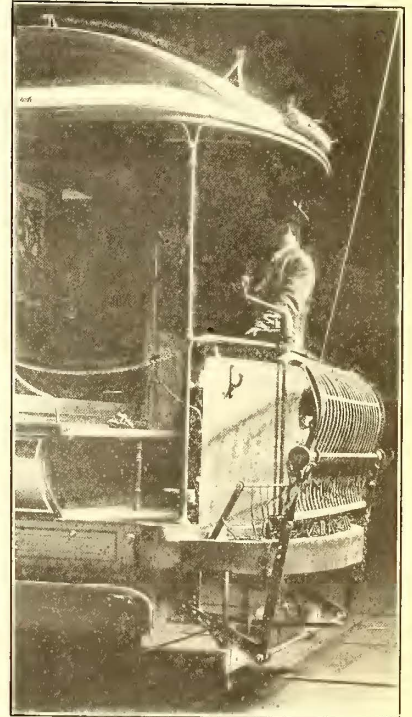
The Worcester Consolidated Street Railway Company is now trying a new double-acting fender invented by J. M. Smith, one of its employees. This fender was one of the many lately tested in Worcester by the Massachusetts Railroad Commission, and made so good a showing that the Worcester Railway Supply Company determined to place it on the market.



FENDER READY FOR ACTION



FENDER IN ACTION



FENDER NOT IN USE

and pattern B, the Philadelphia type, must have a weight of not less than 141 pounds per yard.

The selection and approval of these rails by the service board is in accordance with an ordinance passed by the City Council of Columbus, June 10, 1907, providing that only grooved rails shall be laid on improved streets in the city of Columbus, and requiring the service board to approve the weight and pattern of all such rails. Neither the members of the service board nor the

The general construction and operation of the fender may be clearly seen from the accompanying illustrations. The lower portion is a curved steel grid carried on a shaft which on striking an object turns up immediately to form a protective basket by coming in contact with the upper portion of the fender which is made of chain. The edge of the lower section of the fender is furnished with a rubber hose to soften the shock of collisions. The fender may be easily regulated for any desired rail clearance.

FINANCIAL INTELLIGENCE

WALL STREET, Sept. 11, 1907.

The Money Market

The past week has witnessed a further decided improvement in the monetary situation, both here and in Europe. In the local market the demand for money for stock and corporate purposes has fallen off considerably and has resulted in a decided lowering of rates for practically all classes of accommodation. Time money has been extremely easy, asking charges for all maturities up to six months ruling $\frac{1}{2}$ @1 per cent lower than those recently quoted. Sixty-day money, which commanded 6 per cent a short time ago, was obtainable at $5\frac{1}{4}$ per cent, while money maturing in from four to six months could be had at 6 per cent, as against $7@7\frac{1}{2}$ per cent reported a few weeks ago. Money on call during the early part of the week was in abundant supply at rates ranging from $2\frac{1}{2}$ to $3\frac{1}{2}$ per cent, but at the close of the week there was a general marking up in the rates to 7 per cent, due to the preparations making for taking up the \$40,000,000 $4\frac{1}{2}$ per cent 50-year bonds of the City of New York, the payment of a considerable amount due to the Pennsylvania Railroad Company on account of the Union Pacific purchases of Baltimore & Ohio stock last fall, and to the redemption of about \$6,000,000 Japanese Government 6 per cent bonds. These payments called for an aggregate of more than \$80,000,000, but it is generally believed that the tying up of this vast amount of money will be only temporary, as it is expected that the money paid for the new New York City bonds will be redeposited in the banks in the near future. The success of the New York City bond issue was unparalleled in the history of the city and indicates the willingness of investors, both large and small, to put their funds into attractive issues whether they be offered by corporations or by municipalities. More than 950 bids were received for the issue, aggregating \$207,159,420, at prices ranging from 100 to 110, the latter offer being for a small amount.

The demand for money at the principal European centers has been considerably smaller, and has been reflected in a decided easing off in the private discount rates at both London and Paris. The official discount rates, however, remain unchanged. The foreign exchange market developed pronounced weakness, prime demand bills declining nearly a cent a pound to 4.86, a rate which precludes any possibility of gold exports to Europe.

The bank statement published last Saturday was rather disappointing. Loans increased \$611,800, cash has decreased \$1,426,800. Deposits increased \$170,800, which, deducted from the decrease in cash, shows a reduction in the surplus reserve of \$1,384,100. The surplus now stands at \$7,372,350, as against \$6,577,925 in the corresponding week of last year, \$4,831,350 in 1905, \$38,438,250 in 1904, \$15,372,200 in 1903, \$715,075 in 1902, \$6,915,875 in 1901, and \$26,056,250 in 1900.

The Stock Market

Largely to the exclusion of everything else, Wall Street's interest has recently centered in the \$40,000,000 bond issue of the City of New York, bids for which were opened on Tuesday last. Nearly 1000 bids were received for the issue, aggregating more than \$207,000,000. The fact that prior to the opening of the bonds there was active trading in the bonds on the local curb market "when issued" at substantial premiums over par was very naturally accepted as in the light of a foregone conclusion that the issue, unlike the most recent emissions by the City of New York, would prove an unqualified success. Of course, the extremely favorable terms on which these bonds were offered to investors had very much to do with this condition of affairs, as opportunities to secure a 50-year $4\frac{1}{2}$ per cent obligation of any such municipality as the City of New York are extremely rare, a fact thoroughly appreciated by investors of large and small means, and especially managers of estates, trusts, etc., not only throughout the United States, but in Europe as well. In consideration of this situation it was perfectly natural that the stock market should have reflected a decidedly improved tone, as it was appreciated that the success of the New York City loan would undoubtedly lead up to a much broader and better bond market generally, which in turn would sooner or later culminate in a stronger market for stocks. As contributing in no small degree to the better tone to the stock market was a considerable falling off in the rates for time money and a slight hardening in quotations for call loans was not regarded as an altogether unmixed blessing, as it

was accepted as being due to withdrawals of funds by intending subscribers to the New York City bonds and therefore only a temporary affair. Besides this, a decline in foreign exchange rates here and a betterment of monetary conditions abroad were taken as strong indications that this country will be able to draw gold in large quantities from Europe this fall and that, consequently, we would experience no difficulty in handling our crops, particularly in view of the attitude of the Treasury in coming to the aid of the banks by making liberal deposits with them during all the crop moving periods. Evidences that both Federal and State authorities will from now on pursue safer policies with reference to the large corporate interests in different parts of the United States were also accepted in a very favorable light, and about the only development that might be construed at all unfavorably was the fact that in practically all lines of commerce and trade a relaxation is now apparent. However, this was likewise looked upon as another blessing in disguise, as it is thoroughly appreciated that this movement on the part of merchants and manufacturers is merely in the nature of getting their houses in order. A further reduction in prices for refined copper was viewed as in the best interests of those chiefly concerned, as it was felt that it would eventuate in a large increase in the demand from consumers; at any rate the stocks of most of the large copper producing concerns recorded greater or less advances in the market during the week, a fact which applies to the shares of pretty much all industrial and railway corporations.

Developments in connection with the local traction companies have been highly interesting, values of these securities shrinking to the lowest prices ever touched in the market. The chief event of the past week, from a stock market viewpoint, was, of course, the suspension of dividends on Interborough-Metropolitan preferred, a step which had been pretty thoroughly discounted in all the recent fall in the securities of that company. In refreshing contrast to the foregoing was the declaration of the regular quarterly guaranteed dividend of $1\frac{3}{4}$ per cent by the Manhattan Railway Company.

Philadelphia

The dulness prevailing in the general securities market during the past week was reflected to a great extent in the local traction shares. Trading in the group included a very small number of issues, only a few of which developed any degree of activity. Philadelphia Rapid Transit was again the leader of the list, upwards of 8000 shares changing hands. From $15\frac{1}{2}$ the price ran off to $14\frac{3}{8}$, under moderate pressure, but at the close the stock (\$42.50 paid) was sold from $22\frac{1}{2}$ to $19\frac{1}{2}$. Union Traction was fairly animated and weak, about 2200 shares selling at $54\frac{3}{4}@52$. Otherwise the market was absolutely featureless. Philadelphia Traction brought $91@90\frac{1}{2}$, and United Companies of New Jersey sold at $245\frac{1}{2}@241$. Other transactions included United Traction of Pittsburg at 46, Consolidated Traction at 69, and Philadelphia Company common at 41.

Chicago

The decision of the United States Court of Appeals, in which it was held that Judge Grosscup had no power to turn over to the Chicago Railways Company the properties of the Chicago Union Traction Company and its subsidiary companies without consent of the bond and stockholders of the underlying companies, was received with some satisfaction on the part of the Eastern interests in Chicago traction affairs. A new plan will now be formulated by new interests which, it is said, will more fully represent the holders of the underlying securities than did the old plan, and it is thought that the new plan will receive the approval and support of the holders of the underlying security holders. It is believed that application will be made for an extension of time given the Chicago Railways Company for accepting the new city ordinance. Trading in the local traction issues during the week were unimportant. South Side Elevated sold at $81@80$; Chicago City Railway at 150; Metropolitan Elevated preferred at $65\frac{3}{4}$; Northern Elevated preferred at 60.

Other Traction Securities

The feature of the Baltimore traction shares was the pronounced strength exhibited by the United Railway issues, prices for all classes of bonds and the stock advancing sharply on moderate purchases. The 4 per cent bonds, after selling at $84\frac{1}{2}$, rose to 86, while the incomes advanced nearly a point to

52 $\frac{7}{8}$. The refunding 5s moved up a point to 78 $\frac{1}{4}$, while the stock gained 1 $\frac{1}{2}$ points to 13, on the purchase of a few hundred shares. Trading in the other issues was practically at a standstill. Norfolk Railway & Light 5s brought 95. The Boston market was extremely quiet, and while prices moved with some irregularity, the general tone was firm. Boston Elevated sold at 130, and West End common and preferred sold at 85 $\frac{1}{2}$ and 101@100, respectively. Boston & Worcester common advanced $\frac{3}{8}$ to 20, and the preferred stock brought 65. Boston & Suburban sold at 14. Massachusetts Electric issues were quiet, but steady, the preferred selling at 51@51 $\frac{1}{2}$ and the common at 13@12 $\frac{1}{2}$.

Quite a little trading has been done in traction securities on the Cleveland Stock Exchange within the past week. Cleveland Electric has shown strength by a gain of six points, the last sale being at 52. The announcement of \$1,000,000 new stock to be sold at \$20 a share by the Northern Ohio Traction & Light caused the market to drop away from that issue somewhat, the decline being several points. The closing quotations were 20 bid and 21 $\frac{1}{4}$ asked, while the figures had formerly stood around 24. Aurora, Elgin & Chicago preferred was quoted at 72 bid and 75 $\frac{1}{4}$ asked, while Toledo Railway & Light stood at 21 bid. Forest City closed at 96 bid and 98 $\frac{1}{4}$ asked.

Security Quotations

The following table shows the present bid quotations for the leading traction stocks, and the active bonds, as compared with last week:

	Sept. 4	Sept. 11
American Railways	48	46 $\frac{1}{2}$
Boston Elevated	130	129
Brooklyn Rapid Transit.....	48 $\frac{1}{4}$	45 $\frac{3}{8}$
Chicago City	150	150
Chicago Union Traction (common) certificates.....	—	2 $\frac{7}{8}$
Chicago Union Traction (preferred) certificates.....	—	25 $\frac{1}{2}$
Cleveland Electric	—	50
Consolidated Traction of New Jersey.....	67	67
Detroit United	64	64
Interborough-Metropolitan	9 $\frac{3}{4}$	8 $\frac{3}{4}$
Interborough-Metropolitan (preferred)	28	25 $\frac{1}{2}$
International Traction (common).....	—	—
International Traction (preferred), 4s.....	—	—
Manhattan Railway	120	117
Massachusetts Elec. Cos. (common).....	13	12
Massachusetts Elec. Cos. (preferred).....	51	50
Metropolitan Elevated, Chicago (common).....	21 $\frac{1}{2}$	21
Metropolitan Elevated, Chicago (preferred).....	63	—
Metropolitan Street	38	37
North American	62 $\frac{1}{2}$	60
North Jersey Street Railway.....	40	40
Philadelphia Company (common).....	39	38 $\frac{1}{2}$
Philadelphia Rapid Transit.....	14 $\frac{3}{8}$	19 $\frac{3}{4}$
Philadelphia Traction	91	91
Public Service Corporation certificates.....	62	65
Public Service Corporation 5 per cent. notes.....	92	92
South Side Elevated (Chicago).....	80	80
Third Avenue	56	50
Twin City, Minneapolis (common).....	90 $\frac{1}{4}$	91
Union Traction (Philadelphia).....	54 $\frac{1}{4}$	51 $\frac{1}{2}$

a Asked.

According to the "Iron Age" there is a more cheerful feeling in the Eastern pig iron trade, due to the fact that there has been increased activity, some good concerns having bought not only for the last quarter, but also during the first quarter of next year. It is estimated that the purchases in the Eastern markets aggregate about 50,000 tons. In the West and South buyer and seller are still apart. The copper market is utterly demoralized. The effort to induce buyers by naming 18 cents for electrolytic has been a flat failure, and the conviction is gaining in the trade that there will be no halt until 15 cents is reached. Electrolytic has been sold for shipment abroad at the equivalent of 16 $\frac{3}{4}$ cents, and is now being offered at 16 $\frac{1}{2}$ cents without takers.

NORTHERN OHIO SECURING FUNDS FOR IMPROVEMENTS

The directors of the Northern Ohio Traction & Light Company have decided to issue \$1,000,000 stock to be sold at \$20 a share, for the purpose of securing funds to cover the improve-

ments that are being made this year. Owing to the unsatisfactory condition of the bond market, it was felt that bonds could not be disposed of to good advantage. To secure the funds it had become necessary either to issue stock or suspend the payment of dividends. Of the two methods, it was decided to call upon the stockholders. The company has sold \$8,000,000 of its authorized \$10,000,000 capital stock and an additional \$1,500,000 has been issued and held in the treasury. The stock to be put out will come from this issue. It will be sold to the stockholders to the extent of one-eighth of their present holdings, one-fourth to be paid on Sept. 20 and one-fourth on the 20th of each of the following months of the year. No fractional shares will be sold. The improvements for the year will entail an expense of about \$375,000, of which about \$100,000 has been required for new rights of way. The equipment purchased also amounts to quite an item. The sale of stock will provide \$200,000, and the remainder will be paid from the surplus above the amount paid to stockholders in dividends. The gross earnings for the year are estimated at about \$1,900,000, and a surplus of nearly 4 per cent will probably be earned on the stock. Next year, it is thought, \$100,000 will cover the cost of improvements. The gain in earnings so far this year demonstrates the advantage the improvements have been to the road, and when they are all completed the showing will be still better.

NEW ENGLAND STREET RAILWAY CLUB AT PROVIDENCE

The fifth annual outing of the New England Street Railway Club was held at the Pomham Club Thursday, Sept. 5. The members of the club, numbering 135, arrived in Providence at 11 o'clock and took a special car to the club house. A ball game was to have been played, but the weather precluded that, diversion, and the time was given up to bowling and whist. The dinner was served at 1.30 o'clock and was entirely informal, the President, Henry C. Vage, being at the head of the table. The entertainment which was to have been given at Vanity Fair was also postponed. The club returned to Boston at 6 o'clock last evening. Among those present were Herbert W. Smith, Elliott O. Johnson, W. S. Fernald, G. W. Adams, E. W. Holst, L. H. Parker, C. B. County, C. H. Larimer, Frederick A. Smith, Edwin Dey Sibley, Frank D. Masterson, W. L. Adams, F. A. Boss, W. S. Sisson, Frank Booth, W. F. Abeley, W. J. Keenan, J. F. Malloney, George C. Tewksbury, George C. Ewing, Joseph A. Fitzpatrick, A. C. Fairbanks, T. H. Plouff, Charles W. Chandler, J. Henry Blanchard, A. W. Chesterton, F. L. Fairbanks, R. W. Eaton, G. H. Gleason, George H. Martin, C. H. Andrews, Frederick D. Hall, C. E. Brint, J. M. Cox, G. T. Paraschos, Charles A. Record, J. M. Prendergast, J. Allison Smith, Philip A. Welsh, William W. Field, Jerry W. Hayes, James A. Montgomery, William C. Snow, D. Kennedy, George A. Ober, Robert Mathias, D. G. Trayers, J. Harry Seavey, J. Emil Johnson, Louis L. Drake, Melville B. Chase, Wright Webb, W. L. Ford, R. S. Brown, W. E. Case, Jr., H. M. Ballard, L. A. Crowell, John J. Lane, D. L. Prendergast, E. L. Janes and James F. Wattles, of Boston; J. E. Thielson, D. F. Sherman, Harry Daw, Railroad Commissioner Joseph P. Burlingame, William Rice, J. P. Thorndike, F. H. Brown, L. A. Shippee, Edward Fitzgerald, M. H. Bronson, W. C. Langford, Jesse Mills, William M. Peck, William E. Carr, F. H. Young, Alonzo R. Williams, J. E. Case, John McDonald, Frank McDonald, R. Roscoe Anderson, Superintendent of Transportation Rhode Island Company; Franklin A. Smith, Secretary Providence & Danielson Railway Company; H. F. Purrington, H. H. Botham, J. H. Hackett, A. L. Campbell, of Providence; James W. Sullivan, E. P. Shaw, Jr., G. M. Cox, S. K. Page, Newton, Mass.; J. E. Dozier, Leslie H. Brown, Lynn, Mass.; Deputy Railroad Commissioner David J. White, Pawtucket; H. C. Page, Springfield, Mass.; A. C. Ralph, George C. Moore, Taunton, Mass.; George S. Brush, Newtonville, Mass.; F. F. Munroe, Mt. Vernon, Mass.; E. C. Clark and E. C. Clark, Jr., Northampton, Mass.; George P. Dole, Wareham, Mass.; John R. Miller, Walter E. Gardner, Medfield, Mass.; Fred T. Stockwell, H. B. Smith, Cambridge, Mass.; L. S. Pierce, Laconia, N. H.; John W. Ogden, Maynard, Mass.; George H. Burgess, George R. Damon, C. H. Abbott, C. H. Howe, Leominster, Mass.; Reginald M. Campbell, J. E. Southwell, C. G. Corey, New York; W. A. Trubee, Bridgeport, Conn.; H. N. Ransom, Schenectady, N. Y.; M. P. McLaughlin, Wakefield, Mass.; C. V. Mills, Ayer, Mass., and A. E. Jackman, Narragansett.

MORE FREIGHT RIGHTS SOUGHT IN MASSACHUSETTS

A movement has just been started by the Boston & Northern Street Railway to secure freight and express rights from the local authorities in cities and towns north of Boston reached by the trunk lines and branches between that city and Lowell and Lawrence, the principal mill cities of the Merrimac river valley. This action has been impending for some time, but it appears to have been hastened by the success of the Old Colony Street Railway in developing freight and express business from Brockton, Taunton and other cities in southeastern Massachusetts to and from Providence.

There has been no trolley freight business whatever in the Boston & Northern territory up to the present time except a little between Newburyport and Plum Island by the Shaw interests. Within the last two weeks the Boston & Northern petitions have been filed in Lowell, Lawrence, Methuen, Andover, North Andover, Middleton, Danvers, Dracut, Tewksbury, Wilmington, North Reading, Reading, Wakefield and Melrose, and public hearings have been called on several petitions. After the local authorities have acted, it will be necessary to get the local grants approved by the Railroad Commissioners. The petitions now filed cover probably about a third of the Boston & Northern territory, especially the trunk line which leaves the Boston Elevated Railway Company's system of surface lines at Malden, and running north through Melrose, Wakefield and Reading, forks at Reading square, sending one branch to Lowell by way of Wilmington and Tewksbury, and the other branch to Lawrence by way of North Reading and Andover. Fast passenger service with half hourly cars alternating for Lowell and Lawrence out of the Boston Elevated Company's Sullivan square terminal is now operated over this route.

The petitions so far filed lack Malden. Aside from that city the entire through route has been covered sufficiently to foreshadow direct trolley express service from the heart of Boston out over the tracks of the city system to Malden, and thence to the northern districts. With this for a beginning, the Boston & Northern will eventually make similar applications in the rest of its territory, to cover such centers as Lynn, Salem, Beverly, Gloucester, Newburyport and Haverhill, with the towns lying between.

It is not denied that it is eventually planned for the Boston & Northern freight and express service to be developed north of Boston and the similar service already running pretty widely in the Old Colony territory south. In the event of such a connection express cars could be run through from the Merrimac valley cities to the mill cities in the southeastern part of the State. While General Bancroft, of the Boston Elevated Company, has stated that his company intends to develop a freight and express service sufficient to get the cars of outside companies in and out of the central business sections, there is a good deal of opposition to it, and the company's petition for local rights has been for several months awaiting a hearing before the Board of Aldermen.

It is doubtful if the Old Colony express service is brought any nearer Boston until the solution of the Boston Elevated's freight problem makes it possible to make actual entrance to that city. Only this summer the Old Colony secured its local rights in Quincy after a long deadlock, thus completing its chain of freight and express franchises up to the edge of the Boston system. But for the time being the freight cars will not be operated north of the Brockton district. The Old Colony's service at present covers Taunton, Brockton, Rockland, Whitman, Abington, Bridgewater, New Bedford, Lakeville, Middleboro, and, by arrangement with the Brockton & Plymouth Street Railway, Plymouth. Most of these places get two round trips a day to Providence, where the cars are handled at the Rhode Island Company's trolley freight house on the water front.

The other principal trolley freight developments in Massachusetts just at present are by the New York, New Haven & Hartford Railroad interests, represented by the New England Investment & Securities Company. This company, having started a trolley express service in the Springfield district, and applied for rights in the Worcester district, has now turned to Pittsfield, and is getting things in shape for a freight service both north and south of that city. Within the last week or ten days it has started a heavy double-truck combination passenger and express car over the Berkshire Street Railway, running five round trips a day to Great Barrington, a two-hour run to

the southward. The car leaves Pittsfield at 6.05, 10.05 a. m. and 2.05, 6.05 and 10.05 p. m. President L. S. Storrs is authority for the statement that the company will replace the combination car with regular express cars whenever the business warrants it.

THE TRANSIT INQUIRY IN NEW YORK

At the continuation of the transit hearing in New York last week by the Public Service Commission the subject considered had mainly to do with the details of the agreement of lease between the different companies and the use made of a \$13,000,000 fund authorized to be applied to the electrification of certain horse car lines. Briefly, the several agreements between the companies were discussed in detail, but nothing was elicited beyond what was already known as a result of the publication of the separate leases at the time the properties were transferred. As regards the charges for electrification, the difficulty was experienced of accurately fixing them because of the difference between the basis on which they had been worked out and the way in which the work was charged. The estimates for this work, made in 1902, were computed according to the franchises of the different roads, just as the reports are made to the Railroad Commissioners, whereas the figures presented by Vice-president and General Manager Root, of the New York City Railway Company, covered the routes as operated, which are quite different from the lines as originally laid down in the franchise grants.

In connection with the hearing, however, an interesting communication was received from Mr. Belmont relating to the construction accounts of the Interborough Rapid Transit Company, concerning which some misapprehension seems to have been created as a result of a recent hearing. Mr. Belmont says the question of items to be charged to the construction account of the subway was left entirely with Mr. Gaynor as accountant, and so he asked Mr. Gaynor now why he included in the construction charges, among other things, the salary of Mr. Bryan as vice-president, the salary of Mr. Belmont, the amounts paid to August Belmont & Company as fiscal managers, the discount on the \$15,000,000 of notes which it has been alleged erroneously was charged against August Belmont & Company, the commission paid to Belmont & Company upon the issue of notes, the item for the publication of the souvenir book, the contribution of \$500 to the National Civic Federation and one or two other matters.

Mr. Gaynor replied to the effect that the misunderstanding complained of was due to the fact that there was no general construction account in the subway other than the equipment account. So far as the salaries of Mr. Bryan and Mr. Belmont were concerned, Mr. Gaynor reported that they were charged to equipment in the earlier stages of the enterprise, according as their services were given to assembling the subway equipment. He distinguished between the salary of Mr. Belmont and a payment of \$25,000 in 1906 to Belmont & Company on account of services as financial managers.

A large part of Mr. Gaynor's letter was devoted to the subject of discounts on bonds. These items, amounting to \$450,000, did not, he said, represent payments to Belmont & Company, and the books of the subway did not show any such entries, but simply that the discounts on the bonds sold through Belmont & Company were charged to equipment account. The price was 97 and accrued interest.

The commissions paid Belmont & Company, said Mr. Gaynor, were three-quarters of 1 per cent on the sales of \$15,000,000 notes, all told, which the banking firm split up with its associates in the handling of the issue, receiving itself \$37,500. As to the publication of the souvenir book, Mr. Gaynor referred to the justification offered by President Bryan, which has already been printed.

The contribution of \$500 to the National Civic Federation, which accompanied one of the same amount by Mr. Belmont personally, Mr. Gaynor declared to be on a par with contributions of other railroad corporations to Young Men's Christian Associations, reading rooms and other undertakings contributing to the welfare of employees. He called attention finally to the fact that the directors' fees were charged to equipment account only to a time two months after the operation of the subway was started.

William Barclay Parsons, chief engineer of the Interborough Rapid Transit Company, after making an examination of both tubes of the Battery tunnel to Brooklyn last week, said the tubes would be opened late next month or early in November

BOND ISSUE TO COAST COMPANY FOR REFUNDING AND IMPROVEMENTS

A trust deed for \$25,000,000 has been executed by the Los Angeles-Pacific Railway Company, of Los Angeles, Cal., in favor of the Southern Trust Company, of that city, to secure the payment of an issue of new bonds to that amount, the security covering all of the extensive properties of the railway company. The Los Angeles-Pacific Railway Company has a bonded indebtedness of about \$12,000,000. The new bond issue has been ordered for retiring or refunding the old bonds, and at the same time providing funds for the extensive improvements which are to be made to the system—improvements which amount practically to rebuilding, re-equipping, and extending several lines of the road. Holders of the present bonds will be given their option whether they will retain their present holdings or exchange them for the new bonds on the basis of dollar for dollar. The retirement of the old bonds will leave about \$8,000,000 to be expended in improvements. The most costly work which the company has planned is the subway scheme, by which the shortest possible lines to Hollywood and Santa Monica will be obtained, and through which high-speed trains will be run at regular intervals. Attractive stations will be built, and the Los Angeles depot, which will be between Fourth and Fifth street on Hill, will have considerable track space. New power stations and substations will be built.

AFFAIRS IN CHICAGO

The order recently entered by Judge Grosscup in the United States Circuit Court, directing the receivers of the Union Traction Company, which operates the street car systems on the North and West sides of the city, to turn these properties over to a new corporation called the Chicago Railways Company, for twenty years, was on Sept. 7 reversed by the United States Court of Appeals. The decision of the higher court remands the case to the United States Circuit Court and leaves the traction situation where it was before the formation of the Chicago Railways Company. It was the opinion of the Court of Appeals that Judge Grosscup had no power to give the possession to Chicago Railways Company without the consent of the bondholders and stockholders of the underlying companies, and declared that the only manner in which the Railways Company can secure possession of the traction properties is through negotiations with the stockholders and the bondholders.

The City Council some time ago passed an ordinance granting to the Chicago Railways Company the right to operate the street car systems on the North and West sides of the city. This ordinance, in the opinion of Justice Brewer of the United States Supreme Court, who read the decision, was fair and should have been put in operation. The Court held, however, that the wisdom of such a decision, or even public necessity from a business point of view, could not be taken into consideration, as the interests of the private property holders were the paramount points at issue. The action taken by the Court of Appeals hinged entirely on the question of jurisdiction. The power of Judge Grosscup to issue the order in favor of the Chicago Railways Company was the only thing assailed. The opinion of Judge Brewer praised the wisdom of the order issued by Judge Grosscup, but declared that legally it was wrong. The ordinance passed by the City Council in favor of the Chicago Railways Company has never been formally accepted by that corporation, and as the time for its acceptance expires by limitation Sept. 14, it will be impossible for that company to obtain possession of the properties by negotiation with the stockholders and bondholders by that time. The entire traction situation, therefore, reverts to the period when the properties were held by receivers, and before the proposed unification of the North and West side lines was contemplated.

The question of widening the space between cars came up last week, but Mr. Arnold's plea was not heeded, Charles V. Weston and Mr. Fleming, both of whom represent the city, voting against Mr. Arnold's proposition to widen the space from 8½ ins. to 20 ins. The standard distance between track centers as previously fixed by the board was 9 ft. 8½ ins. Mr. Arnold proposed to effect the increase by reducing the width of the ears. Mr. Arnold, as chief engineer, brought the

matter of space between cars before the board in a letter on Aug. 21. On the following day, as chairman of the board, he made a statement in which he held that a distance of 20 ins. ought to be established between cars, instead of 8½ ins.

"Since going into this subject," said Mr. Arnold, "I have taken the pains personally to measure the distance between cars, not only on many of Chicago's street, but also on many of the principal streets, both wide and narrow, in the city of New York. I find that the distance between track centers on many of the outlying roads of Chicago is 10 ft. 7 ins., and that in New York it is 10 ft. 2 ins.

"In New York, with this distance of 10 ft. 2 ins., there is a clearance space between cars of something over 2 ft., depending on the width of the cars used. While it is true that the cars operated in New York City are narrow, due to the use of longitudinal side seats, it is nevertheless not clear to me that we cannot get suitable cars for Chicago's needs within a space of approximately 8 ft. 6 ins., especially in view of the fact that the new cars ordered by the Union Traction Company are only 8 ft. 5 ins. wide, and that we may, and very likely will, adopt the 'pay-as-you-enter' type of car."

Engineer Weston's statement went into the subject at length, with this conclusion:

"Unless you can provide ample space between passing cars to make it entirely safe for all persons to stand between them we should contract the space sufficiently to make it prohibitive for anybody to attempt to stand between tracks at a point where two cars are passing."

Engineer Fleming's vote in favor of the narrow space was based on his expressed opinion that "it is desirable either to make the cars narrow enough or the spacing wide enough, so that a person could stand safely between cars passing each other in the street, or so plan the cars and the spacing between tracks that the distance between cars will be so small that the people will clearly understand that it is dangerous to attempt to stand between cars when they are passing on the street."

The board's action establishes 9 ft. 8½ inches as the standard distance between centers of tracks. With cars 9 ft. wide, such as the new Chicago City Railway cars, the clearance becomes 8½ ins. Between two cars, each 8 ft. 5 ins. wide, such as the Union Traction Company has ordered, the clearance is 15½ ins., and with a Chicago City and Union Traction car passing each other the clearance will be 12 ins.

The statement circulated in Chicago and the East to the effect that Mayor Busse would call the attention of the Council to the subject of electrifying the steam lines operating within the limits of Chicago proved to have foundation in fact, for the Mayor in his first message, presented last week, asked the Council to take up the subject and report on it. The Council instructed a committee accordingly. The Mayor, in addressing the Council on this subject, said: "Some little time ago my attention was called to the fact that the New York Central & Hudson River Railroad and other railroads entering New York City had substituted electric power for steam on their terminal lines, thereby doing away with the smoke that is produced in such volume by the common type of steam locomotive.

"It has occurred to me in this connection that, if electric motor power could be substituted for steam power on the terminals of the railroads entering Chicago and coming into the heart of the business district, a large part of the smoke nuisance problem would thereby be solved.

"Acting on this thought while the Council was on vacation, I invited a number of citizens of Chicago, including the chairman of the Council committee on local transportation and the city health commissioner, to accompany me to New York for the purpose of observing the results of the electrification of the railroad terminals there.

"In New York we were taken over the terminals of the New York Central & Hudson River Railroad by Mr. W. J. Wilgus, second vice-president and electrical engineer of that road, who has been in charge of the entire work of converting the motive power from steam to electricity. We found that the immense traffic of the New York Central road and of the other roads using its terminals in New York was being handled successfully and, in fact, with the highest degree of efficiency by means of electrical power, and that the smoke nuisance produced by the common type of steam locomotive had been entirely eliminated.

"Our observations, while satisfying us as to the advisability of substituting electrical motive power for steam power on railroad terminals in the city, have no definite bearing, of

course, upon the difficulties to be surmounted and the practical details involved in the working out of such a change. As Chicago is the greatest railroad center in the world, this problem of doing away with the common type of soft coal burning steam engines inside the city is, of course, a tremendous one, but it is a problem which I think the railroads realize must be faced some time in the near future, and it is one which the city must help to solve, to the end that the smoke nuisance may be eliminated.

"Therefore, I would recommend that this whole subject matter of the electrification of railway terminals in Chicago be taken up by the Council committee on local transportation with power to employ such assistance, make such investigations and prepare such reports as may be necessary to advise this Council fully as to the possibility of installing the necessary electrical equipment for use on the railway terminals of Chicago to do away with the steam engines and eliminate the smoke nuisance from that source."

THE CLEVELAND SITUATION

Judge Estep of the Common Pleas Court has denied the Cleveland Electric Railway Company a writ of mandamus in the injunction cases filed a few days ago to prevent the Forest City Railway Company from occupying Central Avenue under the so-called curative ordinance passed by the City Council some time ago. The ordinance was attacked on the ground that the company had not secured consents of property owners either for the original ordinances or the renewal, and that they are illegal. The court held that the control of the records of the Council could not be interfered with, and that that body had a right to correct ordinary mistakes or blunders. While this decision will have some effect on the suits pending, the attorneys for the old company feel that it will not be material. In all, three suits were filed—one by the Cleveland Electric as a taxpayer, one by the company as the proprietor of a street railway system, and one by Edward S. Isom. In addition Charles Fromson, a property owner on Central Avenue, filed an injunction suit, the allegations being much the same as in the other suits.

The investigation of the Forest City Railway Company's books by representatives of Charles S. Thrasher, a stockholder, has been continued through the week. The result of the examination of the stock certificates showed that out of the total of \$2,000,000 stock of the company about \$900,000 has been sold. The remainder is in the hands of Fred C. Alber, secretary, and is looked upon as watered stock. County Auditor Robert C. Wright is said to be heavily interested in the company, and an endeavor had been made to keep his connection a secret. The investigation has disclosed a number of other stockholders, but their names are kept secret. The accountants and attorneys are endeavoring to learn these names, but the officers will give no information except to refer them to the stock books. It seems that this stock is held in Mr. Alber's name and voted by him, according to the report of the investigators. Mr. Thrasher has threatened to bring suit to ascertain these names if they are not given by the officers.

In explanation of the manner in which Secretary H. J. Davies, of the Cleveland Electric, and A. B. Du Pont, of the Municipal Traction Company, had arrived at the city's share of the receipts from the Central Avenue and Quincy Street lines after the franchises had expired. Council was informed that the receipts from the Quincy line for the time were \$163,961.09, and those of the Central Avenue line were \$300,872.43, making a total of \$464,833.52. From this the operating expenses, \$302,141.79, were deducted, leaving a balance of \$162,691.73. Upon an investment of \$724,000, the entire physical value of the property, 6 per cent. interest was allowed. This, with allowances for depreciation being deducted, left \$78,203.36 net earnings for the city. Mr. Du Pont stated that the valuation of the property was high, but that he had given up to it because the city had no power to collect anything and he felt that it was better to have this amount than nothing. Mr. Davies said the amounts were fair, but not excessive.

CARTER.

Congressman Theodore Burton has been nominated for mayor by the Republicans to oppose Tom L. Johnson. In agreeing to accept the nomination, Mr. Burton stipulated that the settlement of the traction question be left to the administration, and that there be no alliances of any kind. As far as the traction question goes, the most important limitation in

the platform adopted by the convention is that the fare shall not be greater than seven tickets for a quarter.

"We demand a prompt investigation of the expenses of operating a street railway system and an immediate settlement, without favor or partiality for any existing corporation, and with supreme regard for the interests of the people.

"Length of ride, liberality of transfers, modern high-class equipment, cleanliness of cars, frequency of service, are all matters in which citizens are interested, as well as in rate of fare."

Because of the fairness of Mr. Burton in all matters that he has handled in the past, it is believed that he will receive support regardless of political affiliation.

In the trial of the injunction suits brought by the Cleveland Electric to prevent the curative ordinance passed in August from being put into effect, several interesting facts have been brought out. From the evidence of Fred C. Alber, secretary and treasurer of the Forest City Railway Company, it seems that he secured from Mayor Johnson at various times from \$60,000 to \$80,000, for which stock was delivered for C. M. Bates, president of the New Jersey & Pennsylvania Traction Company, in which Mayor Johnson is interested, and M. T. Cable, of Rock Island, Ill. This stock was issued in the name of Fred C. Alber and indorsed in blank by him. That which went to Mr. Bates was delivered to Mayor Johnson, as was a portion of that which went to Mr. Cable. Mr. Alber stated that when he needed money, he sent over to Mayor Johnson for it and always got it. This money was deposited in his own name and afterward transferred to the company's account. It was received, he said, between 1903 and 1906. It was also brought out that Mayor Johnson has indorsed the company's note for \$20,000 to the Cleveland Trust Company, and that the mayor had guaranteed a contract with the Lorain Steel Company. Mr. Alber could not remember just how the contract for cars had been made, whether they were purchased by Mr. Bates and turned over to the company or whether Mayor Johnson had secured them for the company.

The testimony of the registrar of the Forest City Railway Company showed that 900 shares of stock had been delivered to Mayor Johnson and a receipt had been given for them. This was about a year ago. The mayor explained that most of this stock reached C. M. Bates. Mr. Alber stated in his testimony that there were no outstanding notes indorsed by the mayor on Aug. 3, when the curative ordinance was passed.

Figures compiled by the Cleveland Electric Railway Company show that the receipts fell off \$148,261 during the first three months of this year, while seven tickets for a quarter were being sold. During the following three months only \$43,254.94 of the loss was recovered, leaving an actual loss for the six months of \$105,006.48 over the preceding year. The loss in January was heaviest, \$54,606.95, or 12.14 per cent. In February the loss was almost 12 per cent and in March 10 per cent. The following figures show the results for the six months, as compared with the same months the preceding year:

	1906.	1907.	Decrease.
January	\$449,757	\$395,150	\$54,607
February	409,451	360,500	48,951
March	454,773	410,069	44,703
			Increase.
April	461,895	470,996	9,100
May	509,607	534,878	26,270
June	523,839	531,722	7,883
Total decrease.....			\$105,006

An increased number of passengers was carried, but this did not make up for the loss. In fact, it is claimed that the loss was really greater because more cars were used, more current consumed and the depreciation was greater.

An amendment has been filed to an ordinance instituted some time ago by the Cleveland Electric Railway Company to prevent the Forest City Railway Company from using a portion of its track on Ontario Street. The allegation is made that the ordinance granting the new company joint use of the tracks is void, Mayor Johnson having been interested in the company at the time it was passed. A suit will also be brought within a short time, it is said, to enforcement of the ordinance fixing compensation for the use of the Superior Avenue tracks. The same allegations will be made in this case.

The investigation of the Forest City Railway Company, under the demand made by Charles S. Thrasher, has been continued, although the claim is made that some of the papers needed have not been produced for the use of the attorneys and experts.

NEW PUBLICATIONS

THE TECHNICAL YEAR BOOK, 1907; edited by A. C. Kelly and Charles Weeks. London, Percival Marshall & Company. 399 pages, illust. Price, cloth, 5 shillings; leather, 6½ shillings.

This handy annual presents an epitome of the technical progress of the year with, perhaps, especial attention to the electrical field. It is necessarily made up in large part from articles in the engineering periodicals and papers before engineering societies. But when the large number of such papers and societies is considered the work of the compilers of this book will be appreciated. Blank leaves are bound in for adding memoranda.

THE MARINE STEAM TURBINE, 2d edition, by J. W. Southern. New York, D. Van Nostrand & Company. 163 pages, illust. Price \$2.50.

Turbines seem for many reasons well adapted for marine work; there are fewer working parts than with a steam engine, hence less danger of breakdown; steam is applied direct from the boiler to the shaft; the turbines weigh less than reciprocating engines and are placed well down in the vessel. On the other hand the turbine is most economical when running at a higher speed than is called for by a propeller shaft. The book mentioned discusses these points as well as others connected with marine turbine engineering and is well illustrated.

KAHN SYSTEM STANDARDS. 106 pages. Price, \$1.50. Published by Engineering Department, Pressed Concrete Steel Company, Detroit, London, Toronto.

This is a handbook in limited edition of practical calculation and application of reinforced concrete, which represents a large amount of careful and exhaustive work on the part of the company's engineering department, and is a very valuable contribution on the subject of reinforced concrete. As stated in the preface, the object of the book is to present to the designer tables and information in such form as to be immediately available for use in actual designs, and at the same time to have these tables founded on scientific formulæ approved by the best engineering practice. While the work as presented deals mainly with the Kahn trussed bar, the Kahn system includes in its application two other types of reinforcement. Reinforced concrete bridges and culverts receive separate consideration.

OFFICIAL STATEMENT REGARDING OHIO ELECTRIC RAILWAY

J. B. Foraker, Jr., vice-president of the Indiana, Columbus & Eastern Company, is quoted as follows regarding the Ohio Electric Railway Company, which recently increased its capital stock to \$25,000,000: "On the 1st of September the Ohio Electric Railway Company took over the Indiana, Columbus & Eastern Traction Company and the Lima & Toledo Traction Company, and for the present at least that is all that will be done. Whether the new company will absorb others or not is a matter which is in the future and is one which will be determined as these questions arise."

STREET RAILWAY PATENTS

[This department is conducted by Rosenbaum & Stockbridge, patent attorneys, 140 Nassau Street, New York.]

UNITED STATES PATENTS ISSUED AUG. 27, 1907

864,187. Street Car Fender; George A. Parmenter, Cambridgeport, Mass. App. filed Dec. 1, 1906. Means for partially supporting the fender upon the car truck.

864,192. Car Truck; William G. Price, Butler, Pa. App. filed Jan. 3, 1906. A truck of the non-pivotal type provided with elongated side frames having elliptical springs at the ends thereof which support the ends of the car body.

864,228. Trolley Harp; Frank H. Brueggeman, Norwood, Ohio. App. filed April 23, 1906. The harp is provided with hollow journal boxes containing lubricating oil, the axles of the wheel being exposed at certain points and engaged by contact springs.

864,232. Railway Switch; James D. Downes, Detroit, Mich. App. filed April 1, 1907. The switch is operated through the

medium of a cam wheel in the roadbed adapted to be engaged by an approaching car. Means for indicating the condition of the switch.

864,251. Catenary Suspension-Bracket for Curves; Elmer P. Morris, East Orange, N. J. App. filed Oct. 20, 1906. The trolley is supported from a single messenger cable, rigid bracket arms being provided at the curves to balance the radial strain between the conductor and the messenger wire.

864,252. Catenary Suspension Bracket; Elmer P. Morris, East Orange, N. J. App. filed Oct. 20, 1906. Relates to modifications of the above.

864,269. Brake for Car Wheels; John H. Shaw, New Haven, Conn. App. filed Dec. 14, 1906. A holder provided with a plurality of transverse recesses, a shoe provided with a plurality of corresponding transverse projections on the back thereof adapted to fit in the recesses in the holder, the shoe being adapted when broken to form a series of shoes each having one of said projections.

864,300. Rail Joint; Carl F. V. Hanzen, Buenos Ayres, Argentina. App. filed Nov. 26, 1906. Fish plates combined with a base plate or chair, both elements having downwardly inclined flanges which are secured to each other by bolts.

864,306. Electric Switch Operating Device; Frank A. Johnson and David A. Robbins, Danville, Ill. App. filed Oct. 22, 1906. Relates to the operation of track switches for trolley roads. Special plates or brushes depend from the trolley hangers, which engage special conductors on the trolley pole.

864,329. Brake-Rod Adjuster; William C. North, Durango, Mexico. App. filed Jan. 22, 1907. One portion of the rod consists of parallel legs, the other portion being adjustable keyed between the legs.

864,344. Fluid Pressure System; Samuel B. Stewart, Jr., Schenectady, N. Y. App. filed May 20, 1903. Control system for an electric motor for an air-pressure brake system. Includes among other features a power-driven rheostat having a worm gear connection with the motor.

864,422. Trolley Guard; Charles Harkness, Providence, R. I. App. filed March 8, 1906. In addition to the usual trolley wheel journaled on the harp, there are provided two disks with convex faces disposed toward the trolley conductor and which are yieldable downwardly and laterally.

864,477. Passenger Car; Arthur Lipschutz, St. Louis, Mo. App. filed July 17, 1906. Details of construction of a steel passenger car.

864,488. Signaling Apparatus for Tramways; Joseph M. H. Renson, Liege, Belgium. App. filed Nov. 14, 1906. Comprises two boxes placed upon the track slightly in advance of the junction with a single track section. Each box establishes a signal whenever a car passes from the double track to the single track and vice versa.

864,520. Trolley Wire Hanger or Ear; Harry G. Dyer, Gloucester City, N. J. App. filed Sept. 7, 1906. Has a groove in which the trolley wire is dropped laterally and in which it is sufficiently bent to preclude accidental displacement.

864,571. Trolley Harp; Thomas W. Small, Cleveland, Ohio. App. filed Dec. 5, 1906. The harp has a swivel connection with the pole, the wheel axle being connected with the pole by a flexible conductor.

864,653. Electric Railroading; Isidor Kitsee, Philadelphia, Pa. App. filed April 15, 1907. Trolleys are arranged between tracks, each train being equipped with trolley wheels on both sides so as to engage both adjacent conductors simultaneously. The circuits are so arranged with alternating trolley wires or conductors are of opposite electric potential.

864,669. Switch; Burrell L. Murphy, Colorado Springs, Col. App. filed May 8, 1907. Provides a switch having the switch rails and switch points so constructed that a train in passing from the main track to the branch track rides upon elevated rails and passes over the rails of the main line track without coming in contact with the same.

864,681. Switch Locking Device and Operating Mechanism Therefor; Henry H. Nichols, Philadelphia, Pa. App. filed Feb. 9, 1907. Comprises a rocking shaft carrying a rack and having an eccentric connection with the switch-tongue, a balance shaft carrying a weight and a pinion meshing with said rack, an electric motor connected to the rocking shaft and circuit connections for the motor.

864,549. Time-Lock Mechanism; James C. Mock, Detroit, Mich. App. filed Feb. 19, 1907. A time lock adapted for use with outlying or non-interlocking railway switches. The object is to lock such a switch in normal position for a definite time after any signal which may be connected with it has been set to "stop."

CAUSE OF ILLINOIS WRECK

The Illinois State Board of Railroad Commissioners has investigated the collision of the Charleston & Malloon line of the Mattson City Railway Company near Charleston, resulting in the death of eighteen passengers, and says the accident was primarily due to the absence of a system of train dispatching. The board adopted a resolution instructing the secretary to notify all interurban roads in Illinois to at once furnish the commission with their rules and regulations for the operation of cars.

PERSONAL MENTION

MR. CHARLES W. CALKINS, of Cohoes, has been appointed superintendent of the Cohoes Railway Company, to succeed Mr. Thomas J. Mulcahey, resigned. Mr. Calkins has long been connected with the company, entering its service as a conductor.

MR. THOMAS J. MULCAHY has resigned as superintendent of the Cohoes Railway Company, of Cohoes, N. Y., to become superintendent of the Greenbush bridge. Mr. Mulcahy has been connected with the Cohoes Railway Company since it was leased by the United Traction Company, and has been in the street railway business for about 20 years, having served with the United Traction Company as conductor, inspector and division superintendent.

MR. CHARLES H. STANLEY has been appointed purchasing agent of the Cleveland Electric Railway Company of Cleveland, Ohio, to succeed his brother, Mr. Geo. A. Stanley, who, as noted in the STREET RAILWAY JOURNAL for Sept. 7, has assumed the management of the New York & North Shore Railroad on Long Island, in which the same interests are identified that projected and built the New York & Long Island Traction Company's system, operating between Mineola, Hempstead, Freeport and other Long Island towns.

Mr. FRANKLIN H. SPIESE, of Tamaqua, Pa., a prominent business man is dead. Mr. Spiese was president of the Tamaqua National Bank, originator of the Edison Electric Illuminating Company and the Tamaqua & Lansford Street Railway Company, now merged into the Eastern Pennsylvania Railway Company, and was a director in the Cumberland Valley Telephone, the American Subway and the Schuylkill Subway Telephone companies. He was vice-president of the United Haiti Improvement Company.

MR. C. L. ROGERS, superintendent of the Uxbridge & Blackstone Valley Street Railway, has been made superintendent of the Worcester & Blackstone Valley Railway by Vice-President L. S. Storrs, of the Worcester Consolidated Street Railway and the New England Securities & Investment Company. He will take charge of the line from Worcester as far as Millville, and will also operate that part of the Woonsocket Street Railway from Millville to Woonsocket, which is leased from the Rhode Island Company by the Uxbridge & Blackstone road, in order to bring all the roads in Massachusetts on the line from Worcester to Woonsocket under one management.

MR. J. A. EMERY has resigned as vice-president and general manager of the Birmingham Railway, Light & Power Company, of Birmingham, Ala., and Mr. A. H. Ford has been elected to succeed him, and also to act as president of the company in place of Mr. Robert Jamieson, whose resignation from the company was recently announced in these columns. Both Mr. Emery and Mr. Jamieson remain as directors of the company, however. Mr. Emery has been connected with the company for several years, his first work with it being as engineer in the employ of Ford, Bacon & Davis, of New York. In 1903 Mr. Emery was made manager of the company. Mr. A. H. Ford, the newly elected president and general manager, is manager of the operating department of Ford, Bacon & Davis, and has been identified with the Newman interests for the

past ten years. He was at one time president of the American Cities Railway, Light & Power Company, which controls the systems of Birmingham, Memphis, Knoxville, Little Rock and Houston, Tex.

MR. GEO. R. FOLDS has resigned as general manager of the South Chicago City Railway Company and the Hammond, Whiting & East Chicago Electric Railway Company, which operate jointly in Illinois and Indiana, to become general manager of the West Penn Railways, with offices at Connellsville, Pa., which operate an extensive system of interurban lines in the coke belt. Mr. Folds was born in Oshkosh, Wis., Aug. 23, 1870. Six years later his parents removed to Minneapolis, and it was in that city that Mr. Folds, after a short mercantile training under his father, entered railroading, becoming connected with the Minneapolis Street Railway Company. His first work with that company, whose service, to be exact, he entered in 1893, was in the cashier's department. Subsequently he held positions successively as transfer clerk, mileage clerk and assistant paymaster. Following this he spent a year in a special line of work connected with statements in the claim department. As a result of his work in this connection, the side running boards upon open cars were abolished upon all cars of the Twin City Company and end entrance cars with gates for closing the platform entrances were adopted. During this time Mr. Folds studied at the night law school of the University of Minnesota, from which he was graduated in 1897. Then he was appointed to the claim department of the Twin City Company, and in 1899 was placed in charge of the claim department of the St. Paul division of the company. In 1902 Mr. Folds was appointed assistant to the general attorney of the Brooklyn Heights Railroad, and the following year he was made assistant to Vice-President and General Manager Calderwood, of the Brooklyn Rapid Transit Company. Mr. Folds made a special study of traffic problems in Brooklyn and was responsible for the introduction on the system of a number of new features.

MR. W. E. HARRINGTON, president and general manager of the Eastern Pennsylvania Railways Company, of Pottsville, Pa., has resigned the latter position and will henceforth retain his office as president of the board of directors only, relinquishing the management of the system to Mr. L. C. Bradley, who has been associated with the company since last June, the latter to hold the offices of general superintendent and general manager. Mr. Harrington, in addition to being president of the Pottsville Union Traction Company, holds the same position as head of the Edison Electric Illuminating Company of Pottsville & Tamaqua, the Minersville Electric Lighting Company, the Citizens' Gas Light Company of Tamaqua, and some twelve subsidiary companies. In 1904-05 Mr. Harrington was a member of the executive committee of the American Street Railway Association and has served for a number of years on the standing rules committee and the committee on the promotion of traffic of that body and its successor, the American Street & Interurban Railway Association. He was largely instrumental in the organization of the Temporary Street Railway Association of Pennsylvania and made a number of addresses at Harrisburg before legislative committees on the four electric railway reform measures which have just passed the legislature. For eight years ending in 1904 he was general manager and vice-president of the Camden & Suburban Railway Company. After the lease of this company to the Public Service Corporation of New Jersey, Mr. Harrington occupied, for a short time, the position of manager of the New York-Philadelphia Railway and its allied properties, but in July, 1905, accepted the position of operating manager of the electric railway, lighting and gas properties of J. C. White & Company, of New York. In this capacity he was called upon to develop the properties of the Eastern Pennsylvania Railways Company, which owns the gas, electric lighting and railway interests centering at Pottsville. Mr. Harrington will retain his active membership as a director of the Mutual Life Insurance Company, of Scranton, and the Camden & Suburban Railway Company, of Camden, N. J. Mr. Harrington is a member of the Philadelphia Art Club, University of Pennsylvania Club and New York Railroad Club, and of the American Institute of Electrical Engineers, of New York; past president of the Franklin Institute, of Philadelphia; chairman of the standing committee on the promotion of traffic of the American Street & Interurban Railway Association, and the Pennsylvania Chapter of the Sons of the Revolution.