

ELECTRIC RAILWAY JOURNAL

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*Standard for
Electric Railways*





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The Kansas City Railways Company upon the installation of train operation found that rapid loading at downtown terminals was a vital factor in maintaining schedules.

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East Pittsburgh, Pa.



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Better Intelligence, Better Service, Better Success

THE most important word in the business world today is *service*. No individual nor organization can be a success unless service is rendered. The greater the service the greater the success.

The big thought behind the preparation of each week's issue of the JOURNAL is service—the best possible service that can be rendered to everyone who reads its pages.

The success of the industry served by the ELECTRIC RAILWAY JOURNAL depends wholly on the quality of service rendered the public. That quality of service which means success is not possible unless each employee—humblest to highest—does the best work of which he is capable.

"How to render greater service to the industry?" was the question we asked ourselves a few months ago. The answer was the "Monthly Maintenance Issue."

Maintenance is one of the great problems of the electric railway. It was decided that the third issue of each month be devoted almost exclusively to helpful, instructive, interesting material of special service to the maintenance men. By rendering greater service to the maintenance men greater service could be rendered the entire industry, and the industry could give better service to the public.

The Monthly Maintenance Issue is sold separately. All alert managers will order and distribute this one issue at least, for they realize that greater success is the result of greater service and that greater service can be secured by placing in the hands of the employees for whom it is intended the maintenance data and information that will enable them to do better work. The manager's opportunities are not being fully used until he sees to it that the Monthly Maintenance Issue reaches *all* his car, line, track and power maintenance supervisors. See last week's issue for the last sample of the M. M. I.

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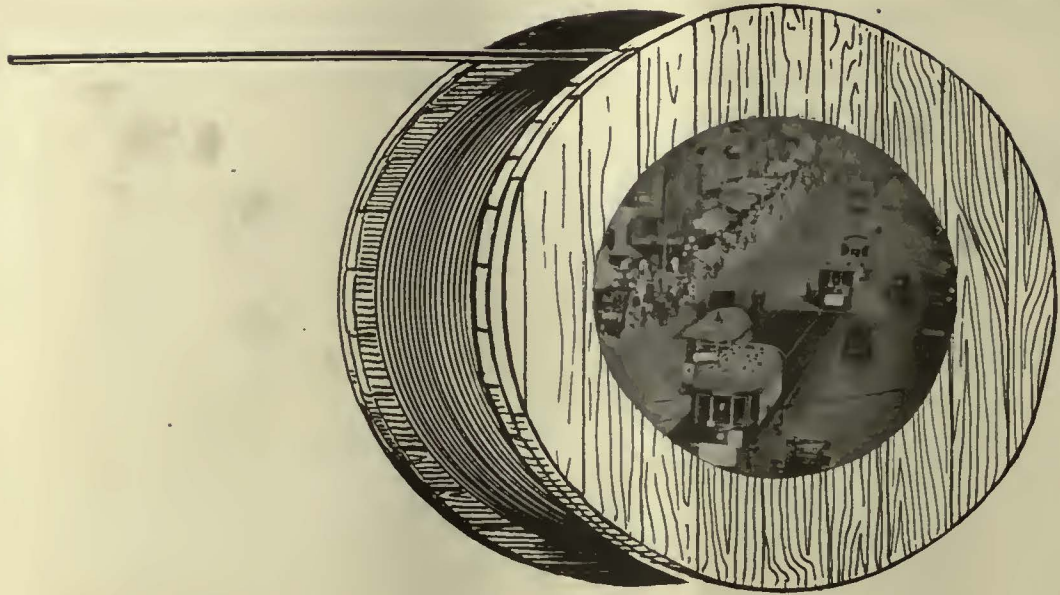


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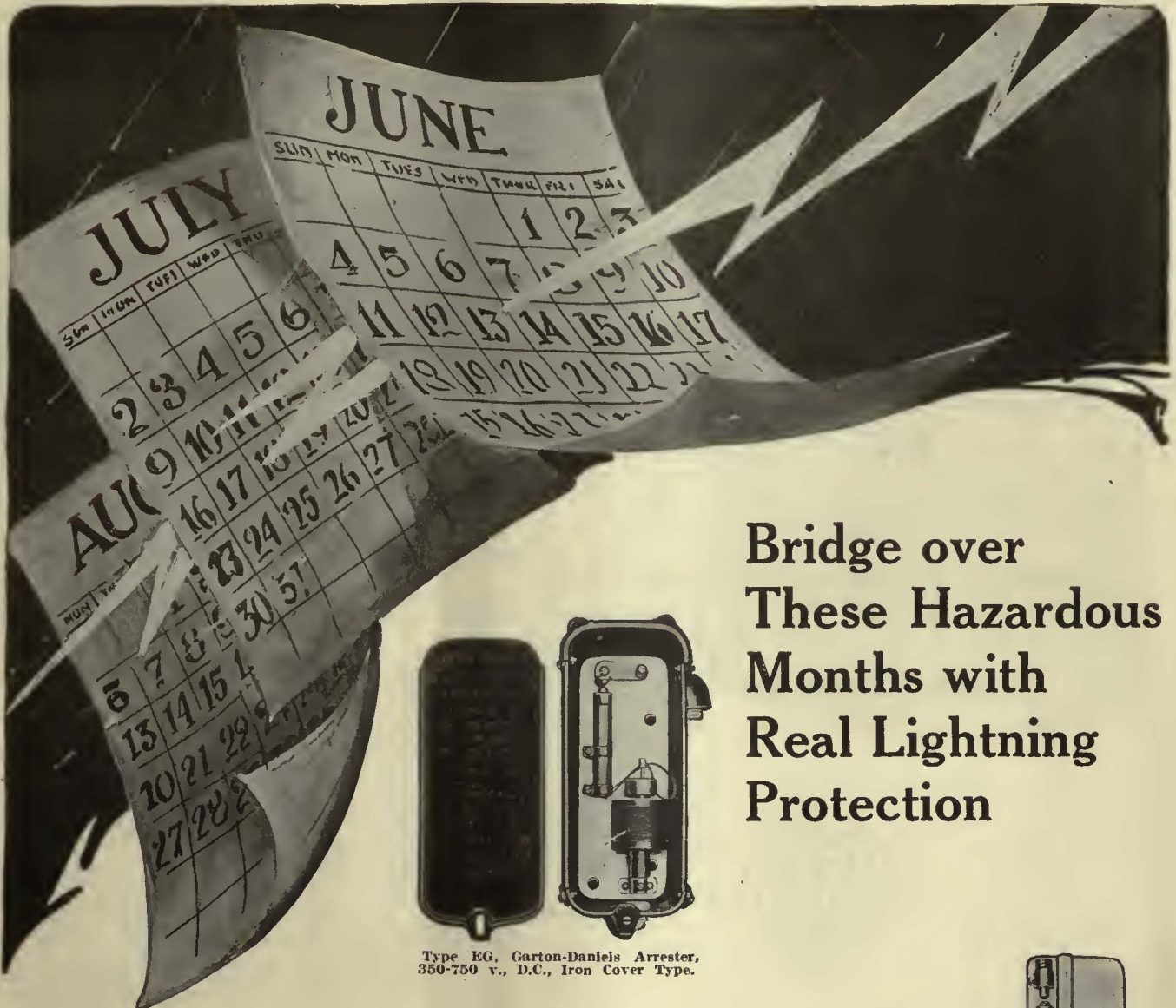
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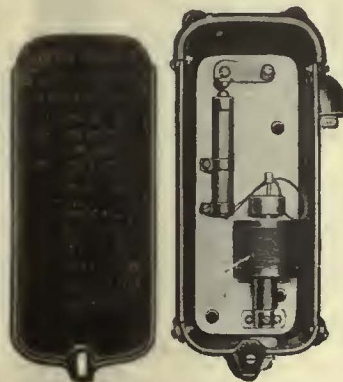
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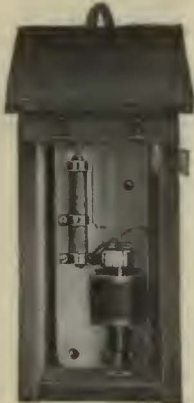
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International Creosoting & Construction Co.

General Office—Galveston, Texas

Plants: Texarkana, Texas Beaumont, Texas
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*The International
Dating Nail*





National Pneumatic Equipment

Means More Than Hardware!

WE'VE talked about those 25 new cars of the Ontario Hydro-Electric Commission before. And they're worth talking about some more!

Don't overlook the fact, please, that it's not merely pneumatic door engines alone that makes this job worthy of your attention. It's the way the pneumatic operation is backed up by our doorshaft and folding step mechanisms that counts most.

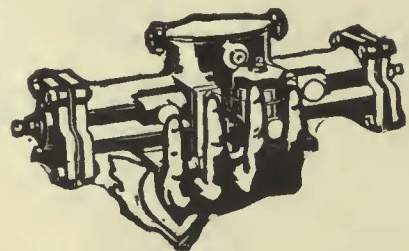
The ball bearing door shaft mechanism has taper thrust collars to allow free movement no matter what time and traffic may do to throw the platforms out of line. So, too, with the ball bearing mechanism for the folding steps. Here, a thrust collar is used to keep wear off of the shaft—plain or sleeve bearings can't do *that*. Finally, the slide bar between steps and door shaft mechanisms and the levers which tie the engine connecting rods to the door shafts are readily adjustable.

Hydro-Electric safeties next year, the year after and so on will be just as responsive to pneumatic manipulation as they are this winter.

National Pneumatic Equipment means more than hardware.

NATIONAL PNEUMATIC

- Door and Step Control
- Door and Step Operating Mechanism
- Motorman's Signal Lights
- Safety Interlocking Door Control
- Multiple Unit Door Control



National Pneumatic Company, Inc.

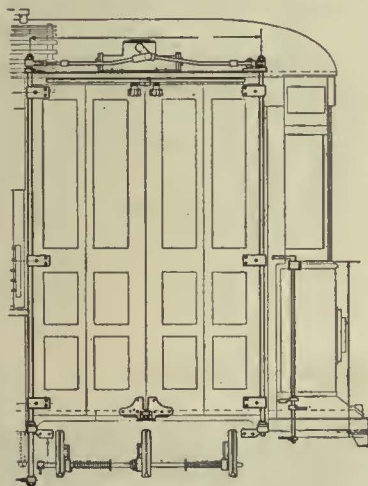
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Because of its electrical characteristics, copper is the chosen bond material. Therefore, it is obvious that in order to maintain the full value of copper as an electrical conductor, a bond should be all copper with direct contact to the rails. With UNA Rail Bonds, this important feature is realized for they are all copper and a direct weld is made of copper to steel rails. This provides a path of copper from rail to rail and full bonding value is realized because power savings are a maximum.

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UNA Bonds are solidly welded to the rails. Many tests show that 25,000 to 32,000 lbs. steady force is required to part one head from the rail. With such strength, long life of UNA Bonds is assured.

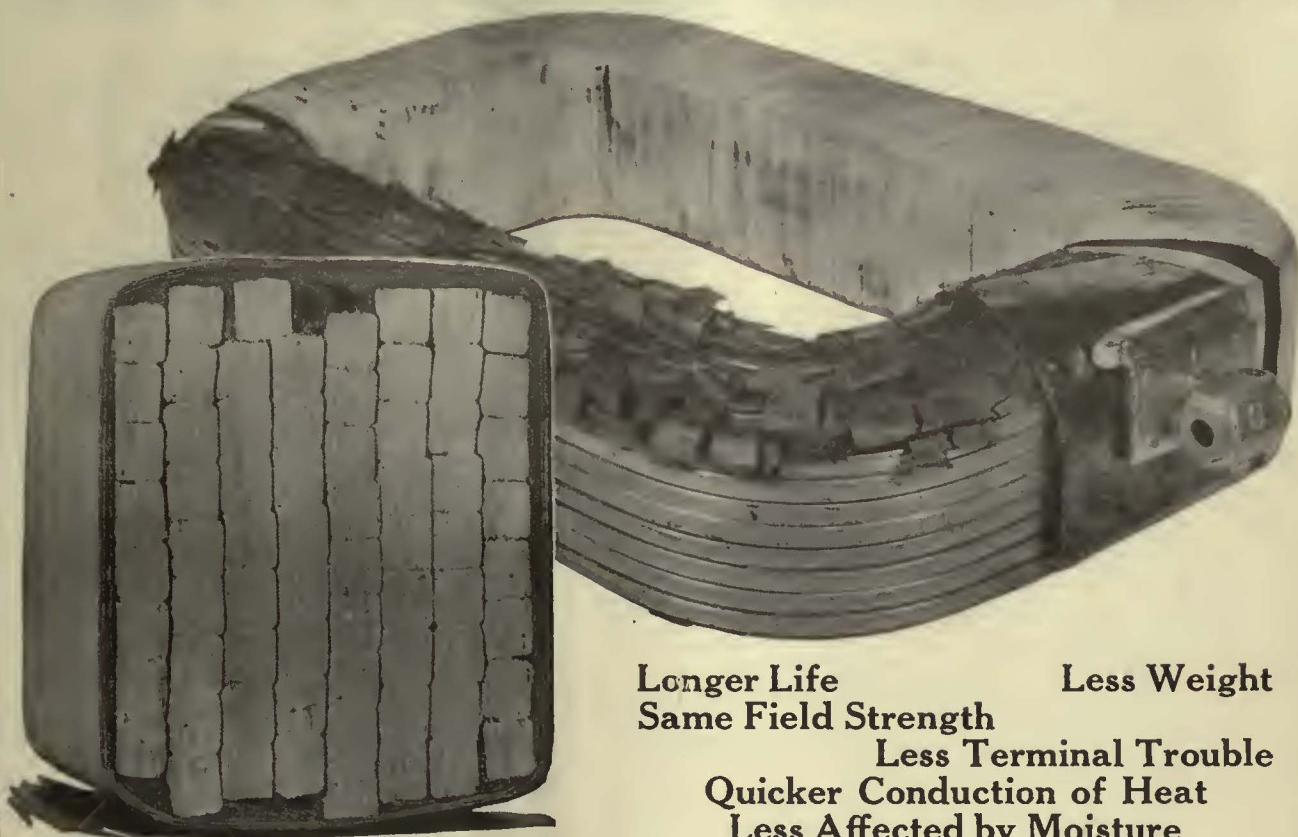
UNA Rail Bonds fully meet the most exacting requirements. Let us send a sample for your particular rail joint.

RAIL WELDING & BONDING CO., Cleveland, Ohio



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Longer Life **Less Weight**
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Less Terminal Trouble
Quicker Conduction of Heat
Less Affected by Moisture

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With coils of like resistance the heat generated is identical and aluminum coils are wound to closely duplicate copper coils.

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The Aluminum oxide insulation is an integral part of the conductor—which

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Let us quote you prices and answer detailed questions

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Lind Aluminum Field Coils

L. E. GOULD, President

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that water-seals ties and cross-rods, resists wear and tear and permits easy repair—it's *asphalt-filled, vitrified brick*.

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Brick, because brick alone gives the enduring resistance which modern traffic necessitates—Asphalt because it absorbs the impact of the cars passing over track-joints, leaves each brick a unit easily removable when track-repairs are required and at the same time protects ties, tie-rods and road bed against surface water.

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There is a time-tried and service-tested Galena lubricant for every Electric railway requirement.



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Grade B2

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They Look Alike, But—

There's more to a brush than its appearance.

G-E Carbon Brushes are founded upon research to produce a superior brush for G-E motors. They are constantly being watched and tested to insure that the original standard be maintained.

The three grades meet all requirements of G-E railway motors. But the selection in each case must be correct, dependent on operating conditions. Our specialists on brush application will give you this engineering advice.

By using G-E Carbon Brushes you not only solve commutation problems but help maintain the original quality of your G-E motors.



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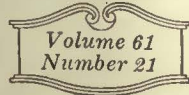
New York, Saturday, May 26, 1923

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

HENRY W. BLAKE and HARRY L. BROWN, *Editors*



The Lessons of Experience in Developing Good Public Relations

THE ignorance of the true situation with respect to the utilities as manifested in Congress and the state legislatures on the part of those dependable men not numbered among the radical and socialistic elements only emphasizes the fact that the task of getting the people informed has by no means been accomplished. The work must go on, its importance during the present year being particularly great, as there is a persistent outcropping of socialistic and anti-state regulation agitation here and there.

In pursuing this work further, the industry may well be guided by the experience thus far, from which it is possible to draw these general conclusions.

The plan to greatly enlarge the number of local stockholders is good, but it cannot be relied upon to afford any security at an election. The stockholders need to be educated just as much as the general public. The California campaign for socialization of the water powers proved this.

Too much reliance should not be placed in having lawyers appear before legislative committees to explain what proposed legislation would mean to the utility. The personal appearance of the practical operating executive, the responsible head of the utility, to answer questions and present facts is much more convincing and effective than the efforts of the attorney paid to represent the utility.

Man to man talks should be had with local legislators and congressmen, preferably while they are back home and off duty, about the problems of the public service companies. Or if the railway executive is not personally acquainted with the man who should be truly informed, then he should get a friend who has confidence in him, and who holds the friendship and confidence of the public official whose ear is sought, to put the railway story before the official—the story of facts.

Some definite interest should be taken and time devoted toward raising the caliber of personnel of the legislatures. The need for this is evident in almost all political bodies.

The vote of the men in overalls counts very heavily. Therefore enlist the support and influence of the utility employees and the employees of manufacturers whose prosperity and welfare are tied up with those of the railway.

Reliance on the national railway association for compilations of data is good, but success in any situation depends on how thoroughly the work of education is carried on locally by the local men. The absent treatment won't do. The work of publicity committees and the use of newspaper space have their place, but the railway men must themselves take the stump in dealing with unsound agitations important to their business.

If state regulation is in jeopardy and the backward step to municipal control seems inevitable in any local

situation, a compromise providing for state regulation of valuation, rate of return and rate of fare, with municipal control of service, extensions, cars, etc., may partially save the day. Such a law is now working out well in Minnesota.

Political Aspects in Chicago Quite Different

I AM for the lowest possible fare consistent with good service and good wages. People who are talking about a 3-cent fare or a 4-cent fare are not speaking advisedly. The future will determine what a just fare is, just to the public and just to the companies. The people demand service and they should have it, and I will not favor any reduction in service for the purpose of getting a lower fare."

That, surprisingly enough, from Chicago's Mayor. What a pleasant relief it is to hear from the chief executive of a large city such an expression of view, based on business sense rather than political adventure. It is also reassuring to reflect on the fact that the people of Chicago finally saw through Mayor Thompson's endless and groundless attacks on the street railway, ostensibly in behalf of the people, but really to create political sentiment, and voted overwhelmingly to rid the City Hall of such tactics. This gives hope for the situation in New York and other cities suffering from mayors afflicted with the anti-traction mania. The turn of the mayoralty in Chicago puts a very much more promising outlook on the prospects for working out a satisfactory agreement when the franchises expire in 1927, or, more likely, an agreement in advance of that. This is a matter of such tremendous importance to Chicagoans that it calls for the most complete and intelligent co-operation. Hence the riddance of sham hostility at just this time is of particular significance.

A Semi-Automatic Substation That Controls Its Own Output

PASSENGERS on the New York Central and New Haven Railroads, entering or leaving Grand Central Terminal, New York City, cannot see an unobtrusive new substation which is tucked in under the Park Avenue viaduct near 110th Street. They benefit by its presence, however, for it enables them to get into or away from the city more quickly due to the hundred volts more or less which it adds to the third-rail voltage. Being ignorant of the presence of the substation, they cannot be expected to realize that it is not just another substation, but embodies features of unusual interest.

Its outstanding characteristic is what may be termed "non-overloadability." The station of the usual type, whether manual or automatic, goes out of commission when overloaded. There is nothing else for it to do except to injure itself, and then it will go out anyway. A constant-potential rotary-converter substation cannot

safely be left on the line when the line voltage falls materially. With the aid of resistors in the feeders it can be operated with a greater range of line voltage than otherwise, but this expedient, while necessary, results in power loss and is limited in ability to keep power on the line in case of heavy demands. In general, however, the constant-potential quality of rotary converter output is a controlling advantage in its favor; the circumstances on the New York Central are exceptional. This station must not go out when the heavy load comes on; in fact, it is distinctly a peak-load station and does not run at other times. Non-overloadability was secured by using a plain shunt-wound generator, the natural drooping characteristics of which are accentuated by means of an automatic voltage regulator.

The new substation is also attendantless, and it contains practically all of the relays which form the nervous system of the modern automatic substation. As it was designed to come into and go out of service at specified times the usual undervoltage and overload control was omitted. A time device could easily have been arranged to replace the usual control, but as a manual substation is near by it is preferable to have the service of the new substation initiated and stopped by its operator. The schedule can then be easily modified, and as he supervises operation anyway by means of ammeters, the throwing of the "start" and "stop" switches occasionally is a mere incident to him.

The use of the motor-generator set in this case permitted unusually simple a.c. power supply, because, as the substation is fed at 11,000 volts, a voltage not too high for direct supply to the synchronous motor, the usual transformers and auxiliaries could be dispensed with.

The Personal Work of the Executive in Bettering Public Relations

REAL service is being done the people of St. Louis by Col. A. T. Perkins, manager for the receiver of the United Railways. Several times recently he has appeared at public meetings and discussed frankly the problems of the company. His latest appearance was before a civic association. At the conclusion of the program for the evening he announced his readiness to answer questions. He did answer many, and no attempt was made to hector him.

The audience was frank and the colonel was even more so. He explained the concern of the creditors. He told about the vast amount of work done in upbuilding the property. He frankly said that much still remains to be done, and that in his opinion the sum of \$4,000,000 might well be spent on improvement looking toward the future. He told his hearers he favors a new long-term franchise for the company and said that the valuation issue will probably be decided by July 1. He brought out forcefully the effect of taxation upon the fare paid by the car riders. His statement along these lines probably came as a revelation to many of his hearers.

Limitations of space do not permit a recapitulation here of all the questions that were put to Colonel Perkins, but the account of the meeting addressed by him as reported elsewhere in this issue does indicate that his discussion made a very favorable impression. In short, the Colonel's talk was an effort at intimate understanding with his public that has been deferred too long by many other operating managers.

Municipal Railways Show Profit

THOSE who believe in the policy of private ownership for public utilities should not be surprised when a statement is issued showing that one of the municipal railways in this country or Canada is making money. The editors of this paper consider that under American political conditions the policy of private operation of these utilities is better, both politically and economically, than public operation, but it would be foolish for any one to claim that simply because a management is appointed by a mayor or common council rather than by a board of directors it is incompetent. According to the sixteen months report of the Toronto Railway, published in the issue of May 12, that system shows a very comfortable profit; the informal statement recently made public by Mayor Doremus of Detroit indicates a gratifying return for the road owned by that city; and Seattle had an operating ratio of less than 75 per cent in 1922.

As these railways have been in operation municipally for only a short time, it may be that some of the figures may have to be changed slightly. Thus, the Toronto report contains the statement that some of the figures should be considered approximate only, because the exact sums to be paid by the city for the property, for electrical energy and other matters have not yet been fully settled, and in the case of Detroit it is well known that no decision by the arbitration board on the charges to be paid to the city by the Detroit United Railway for the entrance of the interurban cars has yet been rendered. Finally, in the case of Seattle, as explained last week, the apparent net return is somewhat larger than if the property were subject to all the charges of a privately operated concern. The figures involved in all of these indeterminate matters are probably small enough, however, not to change the income from operation from a surplus to a deficit.

The critical time in municipal operation does not come during the first few years after the city has taken over the property. During this time, the conditions for successful operation are at their best. Much of the equipment is new. The question of taking the property over has been so prominently before the public that there is an eager spirit on the part of every citizen to co-operate in making the new city enterprise a success, and even a political city administration would hesitate about making a political appointment to the railway administration. Hence, able men are chosen.

The critical time comes some time later, after the edge of civic zeal in the enterprise has become dulled and the politicians feel that they can begin safely to tamper with the operating efficiency of the property. Then will come requests or demands for this particular appointee, or that special extension of the line or service, or other action which would not be undertaken by a private property because financially unwise. Of course, a management, commission or political administration strong enough to resist this pressure will be able to conduct the property on business principles. But the experience with various kinds of public operation in this country has not been very happy, and it is obvious that those enterprises, like railways, in which such a large percentage of the receipts goes in direct payment of labor, and where so much loss can be occasioned through the construction of unprofitable extensions, are particularly unsuited for political control.

Whether these reasons will prevent further extension of municipal operation is a question of the future.

New York Central Railroad Has Installed in Electrified Zone at New York a 2,000-Kw. Motor-Generator Set to Raise the Potential 100 Volts During Rush Hours—Construction of Building Under Elevated Structure on Park Avenue Near 110th Street Involved Special Structural Problems

Distant-Controlled, Non-Overloadable, Semi-Automatic Substation

ONE of the most interesting recent applications of automatic control and safeguarding of power-transforming apparatus is the new substation of the New York Central Railroad on Park Avenue near 110th Street, New York City.

The substation is located underneath the Park Avenue viaduct, over which operate all the New York Central and New Haven trains entering the Grand Central Terminal. The steel viaduct at this location is supported at the sides on stone walls and in the middle on steel columns on spread concrete foundations, which, in turn, rest on the rock and dirt fill between the stone walls.

The substation is designed to fit between the stone walls and has a width less than the distance between the central columns. In the removal of the fill, as the column foundations would be undermined, it was necessary to provide temporary supports for the steel structure and extend the column foundation to a level below the floor of the substation.

The station is designed for two 2,000-kw. synchronous motor-generator sets, of which one is now installed and in operation. The substation generator set functions as in any other station until fully loaded, when it begins automatically to reduce its bus potential in proportion to the exterior load so as to maintain a constant current output. Under maximum swings it raises the local potential at least 100 volts. It will be operated normally without attendants, although an inspector will visit it once a day, and it will be thoroughly cleaned once a week.

The station is started and stopped from the nearest manual substation, that at Mott Haven, 2 miles away. The operator there simply closes a switch to initiate starting of the new unit. This sets in motion the pilot motor on the drum controller of the type standard in General Electric control equipments. Shutting down is a similar operation. Aside from the fact that the operator at Mott Haven has supervisory control the operation is entirely automatic.

In the Mott Haven substation are an indicating ammeter and a curve-drawing ammeter, which show the conditions at 110th Street. There is also a pilot lamp which lights up when the machine in the new substation cuts in on the direct-current circuit. This is done by a contact on the last direct-current circuit breaker which goes in.

The present schedule calls for the starting of the station at 6:30 a.m. and it runs until 10:30 a.m. It is started again at 4:30 p.m. and operates until 6:30 p.m.

A motor-generator set was used at this point rather



This Substation Is Tucked Away Under the Park Avenue Elevated Structure

than a synchronous converter because the fluctuations in voltage are so great that they could not be followed by a synchronous converter, which is fundamentally a constant-voltage machine. The shunt generator, as used here, lends itself admirably to the production of constant current, especially under automatic control. A unique feature in this case is that the control is so arranged that when first started the unit will operate at 150 per cent of full load and hold this until it warms up to a predetermined amount, which usually takes two hours. The control then automatically lowers the current to full-load value, which it can carry continuously.

An incidental advantage of the use of the motor-generator set is that the motor can be connected directly to the 11,000-volt transmission line, thus eliminating transformers and the auxiliaries that go with them. The cushioning action of the transformers was not necessary, desirable as it might be in constant-voltage substations, because the load is controlled automatically from the direct-current side.

In general the layout of the substation is symmetrical about a center line at right angles to the railroad tracks. (See Figs. 1 and 2.) At the west end is the alternating-current switch and busbar section. The station is cut in on two 11,000-volt, three-phase cable loops, either of which may be used in either direction alone in case of cable trouble. That is, either loop may be opened and either side used, as may be seen in the simplified wiring diagram, Fig. 3.

The high-tension equipment is on two levels, the upper level being for the switching and control equipment,

the lower for the main bus and the cable distribution. The high-tension line passes from the cable potheads through disconnects and current transformers to the motor-operated oil switches, all on the upper gallery. Thence the path is to the main bus on the lower level, thence to the gallery, again branching into two circuits, starting and running. In the starting circuit are disconnects, motor-operated oil switches, current transformers, a three-phase starting compensator to lower the voltage to 4,400, and the starting bus. The starting bus is so arranged that the same compensator can be used for starting either unit in the completed station.

In the running circuit there are disconnects, oil switches and current transformers, with potential transformers (two for the three-phase circuit). A house transformer, tapped in on the main bus, provides for the necessary control power and lighting in the station.

The motor-generator set used in this substation is the largest which the General Electric Company has built for a speed as high as 500 r.p.m., the speed of this set. The motor is of standard design for a.c. starting, being provided on the revolving field with brass bars, copper ring segments and a steel reinforcing ring. The field circuit is closed through a discharge resistor during starting. The alternating current generated in the field winding by transformer action, which dies away as synchronous speed is approached, is used to operate a relay which prevents the field circuit from being completed until after the alternating current has disappeared.

The exciter is direct-connected, being mounted on the commutator bearing of the generator.

As suggested earlier, the set is started at reduced voltage through the compensator, which is cut out when the motor reaches synchronous speed. The oil switches are set to trip at 300 amp., so that not more than about 5,700 kva. can be drawn from the line.

As mentioned earlier, the generator is of the shunt type, there being no series-field winding. There is, however, a series-commutating winding on the generator. The plain shunt machine was used here because its drooping characteristic, conduce to automatic control of the output.

A feature of this installation is the high-speed direct-current circuit breaker, shown in one of the illustrations in the foreground in front of the motor-generator set, and shown in another illustration by itself. This is of the JR-4A type, with a capacity of 5,000 amp. at 666 volts.

SOME DETAILS OF THE CONTROL CIRCUITS

In the control circuits the only manual operation is to close the control-power switch (at 110th Street) and the master starting switch (at Mott Haven). Then through the functioning of relays, if the a.c. control voltage is not below 180, an important device known as the control-current contactor closes and completes several circuits, among them the starting circuit of the motor driving the master switch or drum controller (34).* The drum of the master switch then begins to revolve, completing in succession a number of circuits as in all G.E. automatic control equipments.

The control-current contactor also closes a circuit breaker (42) in the magnetizing circuit of the compensator through which reduced voltage is supplied

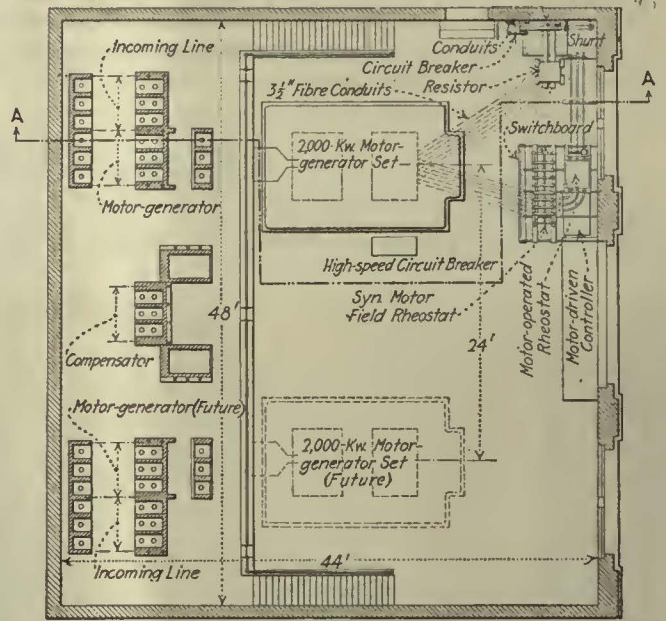


Fig. 1—Plan of Non-Overloadable Substation of New York Central Railroad in New York City

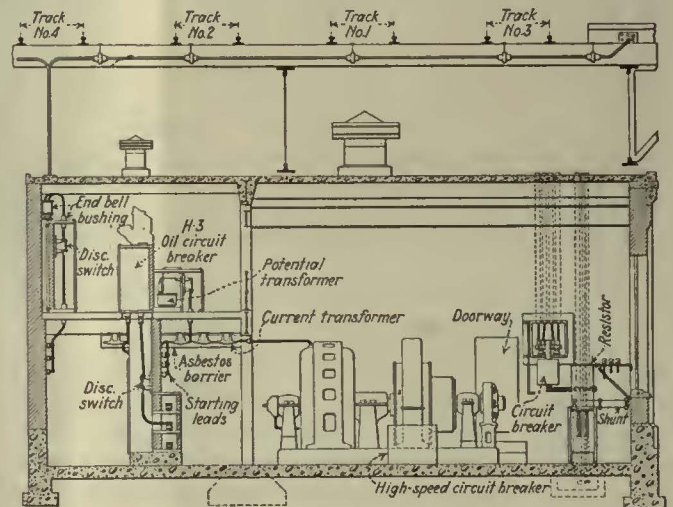


Fig. 2—Vertical Section of the Substation

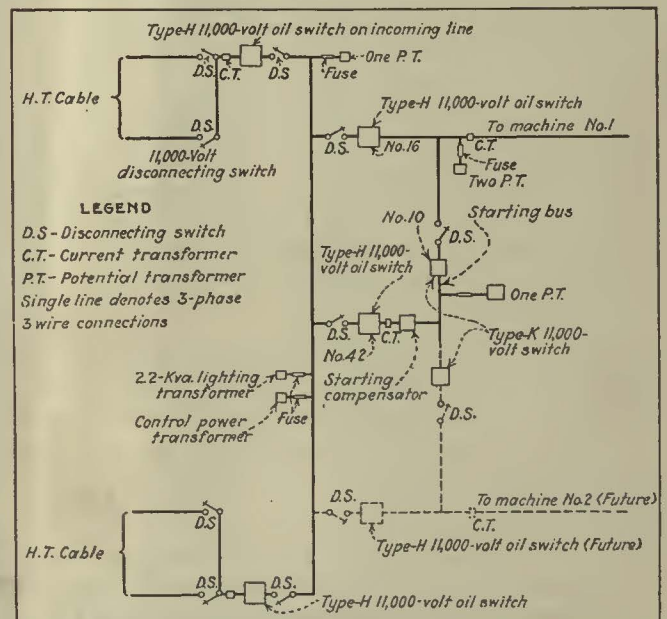


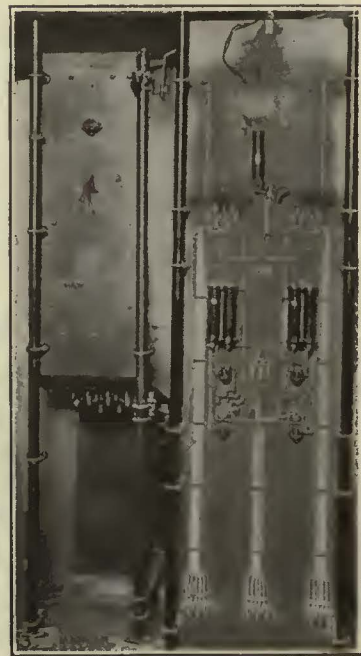
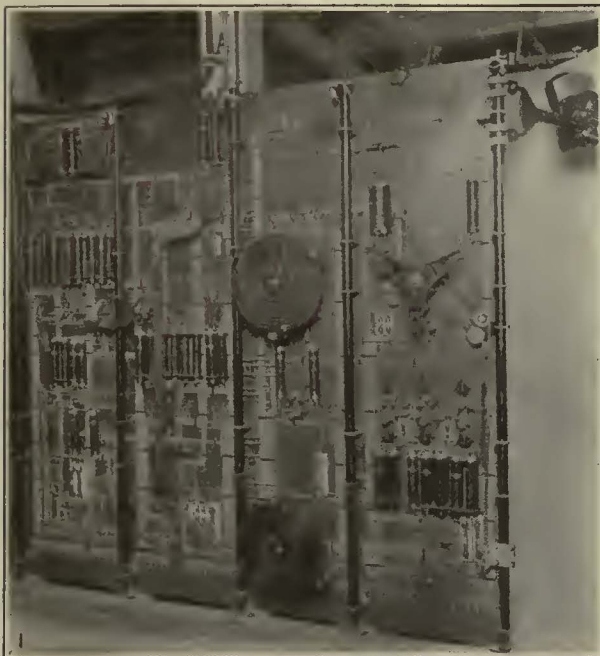
Fig. 3—Single-Line Diagram of 11,000-Volt Circuits in Substation

*Reference numbers after the names of devices correspond to the numbering in Fig. 4, page 877.

for starting. This operation energizes the starting bus. An auxiliary switch on the circuit breaker (42) completes the closing-coil circuit of the main motor-starting oil circuit breaker (10), starting the motor.

As the set comes up to speed the exciter voltage builds up and, with the rotation of the master switch and the corresponding operation of relays, a contactor known as the motor-field contactor (41) closes and applies direct current to the field. However, this cannot occur unless synchronous speed has been reached, because there is

the generator is building up, and a motor-driven automatic voltage regulator, which is a central feature of the installation, is short-circuited for the time being. If the polarity is right, a polarized relay closes after the machine voltage has sufficiently built up, and when the generator voltage is slightly above that of the bus, a relay, known as the d.c. voltage equalizing relay, closes its contacts and operates the d.c. line contactor (18). This connects the generator and the 666-volt bus through a cushioning resistor.

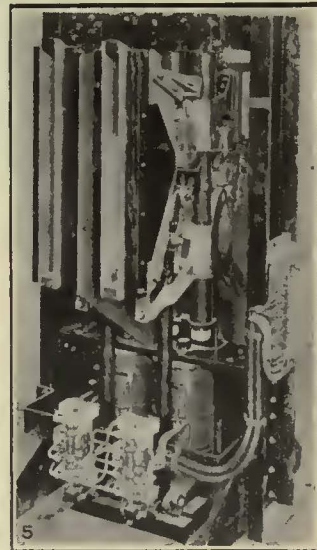
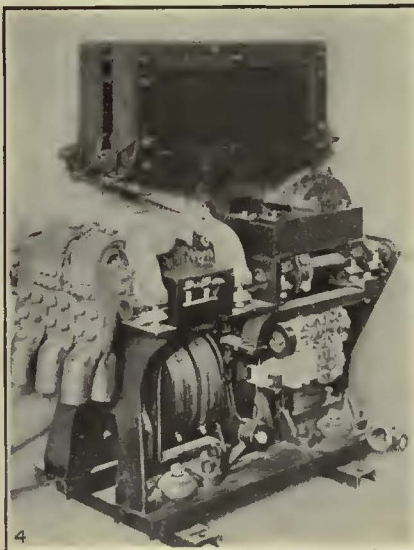


Views of Details of Substation Equipment as Assembled in the Factory

- No. 1—Rear view of control and instrument, and motor-operated rheostat panels for motor-generator set.
- No. 2—Control panels for two incoming lines, front view.
- No. 3—Same, rear view.
- No. 4—High-speed direct-current circuit breaker; height about 3 ft.
- No. 5—Direct-current control contactors; height about 3 ft. 6 in.

linked in the field circuit, by means of an auxiliary circuit containing a resistor and the primary of a current transformer, a relay termed the synchronous-speed relay (13), through whose coil flows alternating current induced in the field by the armature which is gradually reduced to zero as synchronous speed is approached. This relay holds out the motor-field contactor until the alternating current dies away, as it does completely at synchronous speed.

At a given point in the rotation of the master switch the trip-coil circuit of the starting circuit breaker is completed and this circuit breaker opens. Immediately thereafter a circuit is completed through the mechanism of the running circuit breaker (16), which closes and applies full voltage to the motor. Next the compensator circuit breaker is tripped open by the de-energizing of an undervoltage device which forms a part of it. When the running circuit breaker closes it completes a circuit for the contactor (40) for the synchronous-motor-field resistor, which closes and reduces the resistance in the motor field.



The master switch now has rotated to such a position as to stop its motor and it so remains, the station being in full operation. At the same time the short circuit on the voltage regulator is removed and voltage control is taken over by what is known as the d.c. load regulating relay (57). In case the current tends to rise above the setting of this relay its contacts open, bringing the regulator into action and causing the current to be held at a predetermined value.

The manual shutting down of the station by the Mott Haven operator is initiated by his closing a "stop" switch. This energizes a stopping contactor at 110th Street, de-energizing the a.c. undervoltage relay and

As the set is coming up to speed, the d.c. voltage of

dropping out the control-current contactor. This starts the master switch, which, by its rotation, opens the running circuit breaker, the d.c. line contactor and the machine resistor short-circuiting contactor. The master switch then stops and all devices assume the "off" position.

APPARATUS IS WELL SAFEGUARDED IN THE NEW SUBSTATION

The protective features in the substation cover the safeguarding of the apparatus in case of the following abnormal conditions:

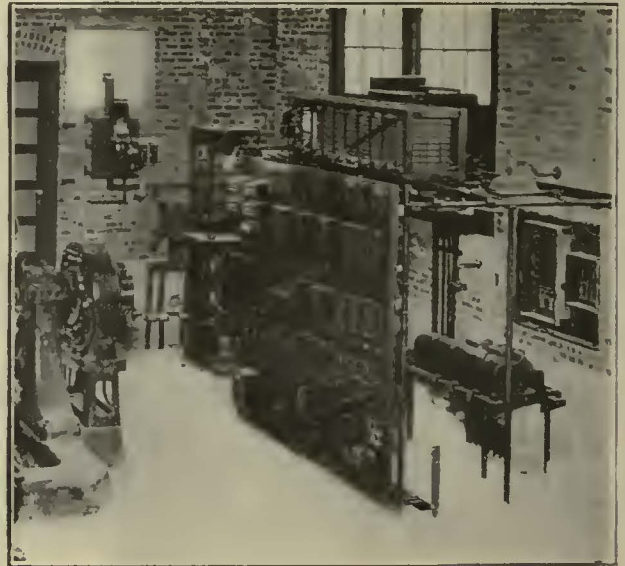
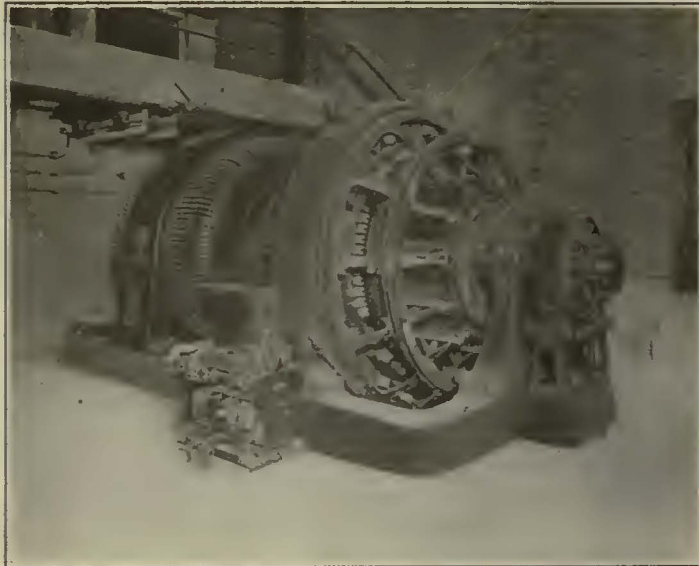
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| Single-phase starting. | Overspeed. |
| Alternating-current under-voltage. | Direct-current overload. |
| Field failure. | Overheated resistors. |
| Wrong polarity. | Overheated starting compensator. |
| Reverse power. | Overheated generator winding. |
| Overheated motor winding. | Under-voltage connection to the direct-current bus. |
| Hot bearings. | |
| Alternating-current overload. | |

Told in very brief fashion, the operation of these several protective features in the order given above is as follows:

Single-phase starting is prevented by a single-phase

As to reverse power, this is taken care of through a special d.c. reverse-power relay (56). Its contacts close at less than the running-light or no-load current in the reverse direction, exciting the closing coil of an auxiliary relay, which in turn opens the coil circuit of the d.c. line contactor (18), disconnecting the machine from the d.c. bus. The machine is automatically reconnected to the line after a time delay, when the bus voltage drops below that of the machine. For protection against heavy values of reverse current, a d.c. reverse power relay (29) is provided. With current in a normal direction, (that is, from the positive terminal of the generator to the bus) the contacts of this relay remain open. On a value of reversed direct current above the setting of the relay, the contacts close, energizing the trip coil of the d.c. line circuit breaker and shutting down the set.

Particular interest attaches in this substation to the way in which overloads are provided for, especially as the substation can be set automatically to take a 50 per cent overload and hold it until the windings are warm enough to require a reduction of load to 100 per cent. For protection against overheated a.c. machine



At Left—The Quick-Acting Circuit Breaker Is Placed on the Floor Beside the 2,000-Kw. M-G Set.
At Right—The Control Centers in This Corner

starting relay (32), which is connected across one phase of the circuit, and the under-voltage relay across another, so that three-phase voltage must be present for starting.

Alternating-current under-voltage starting is provided through the under-voltage relay mentioned above, which is connected across the 220-volt a.c. control bus. When the bus voltage is less than 180, this relay makes contact and opens the circuit of the control-current contactor.

In case of field failure during normal operation, the field relay, which is in series with the motor field, is de-energized and closes its lower contacts. This energizes an auxiliary relay which picks up and opens the coil circuit of the control-current contactor, shutting down the set.

The polarized relay mentioned earlier is provided to prevent operation with wrong polarity. Its coil is connected from the positive terminal of the generator to ground. It must be energized in the proper direction before the d.c. line contactor can close.

windings, a relay (49) is provided which has temperature-time characteristics similar to those of the motor. A heating element in the relay expands and opens the relay contacts, in turn opening the control-current contactor and bringing the set to rest. When the element has cooled down, the set may be started again. These relays also prevent running too long under heavy loads or badly unbalanced phases.

To prevent overheated bearings a thermal relay of another type functions. This contains a flexible spun-copper bellows connected by a copper tube to a metal cylinder located in a hole at the bottom of the bearing near the babbitt lining. The bulb and bellows are filled with a non-freezing liquid, with a boiling point of 90 deg. C. Overheating of the bearing trips the relay contacts, opening the control-current contactor and shutting down the set. The relay must be reset by hand.

Provision is made for a.c. overload by means of what is termed the a.c.-overload time-delay relay (28), which opens after a predetermined period and shuts down the

station. It must be reset by hand. For an overload produced in starting, another time-delay relay (128) is provided. The opening of the contacts breaks the circuit of the control-current contactor and opens the compensator magnetizing circuit breaker.

If overspeed of the set occurs, a centrifugally-operated switch (12) mounted on the motor end of the shaft closes, tripping out the d.c. line circuit breaker. A switch on this breaker opens the circuit of the control-current contactor, which, of course, shuts down the motor-generator. The circuit-opening contacts also interrupt the coil circuit of the latter contactor on overspeed. The set cannot be restarted until the d.c.

line breaker and both sets of contacts of the overspeed limit switch are reset by hand.

An overload on the generator is taken care of by a quick-acting circuit breaker (54), not mentioned earlier, which instantly clears the generator on the negative side. The breaker opens the d.c. line contactor (18) and then recloses immediately. The d.c. line contactor then recloses, as described above.

Overheating of resistors and the starting compensator is prevented by means of thermal relays similar to the bearing-temperature relay.

Particular interest centers in the way in which overheating of the d.c. windings is prevented. Two

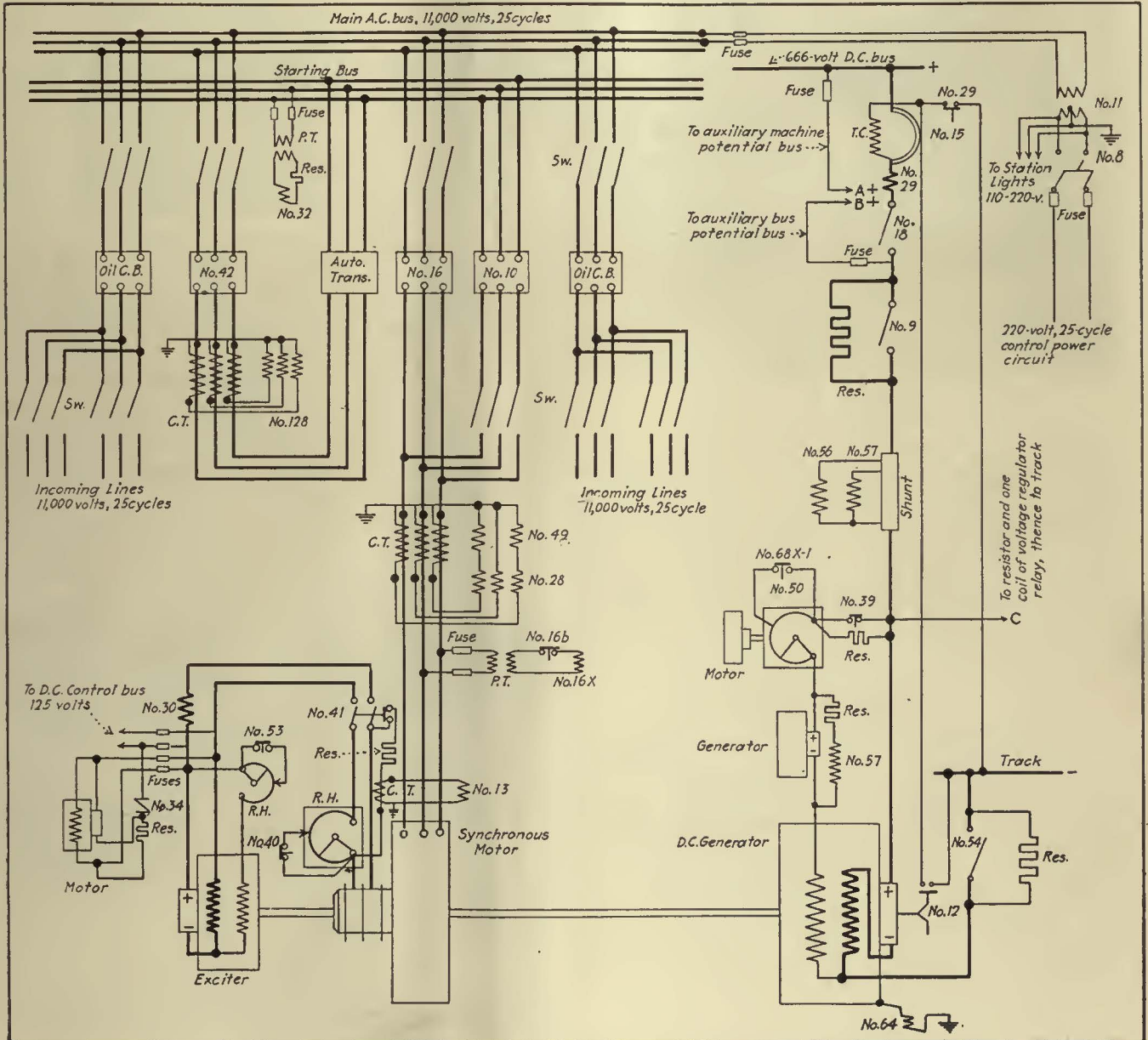
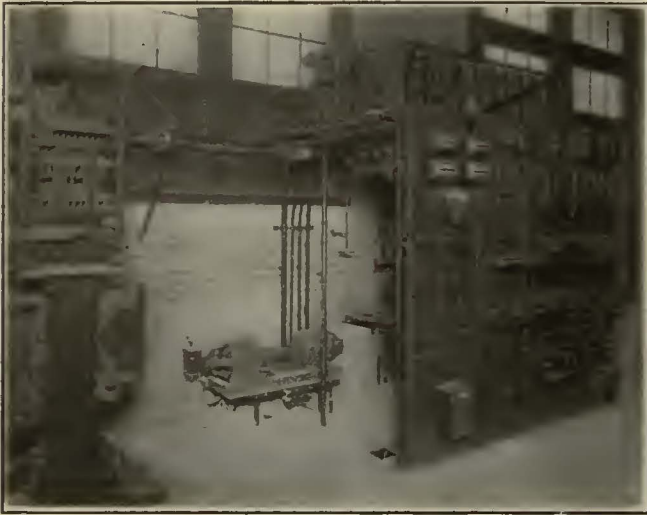


Fig. 4—Diagram of the Power Circuits (Control Circuits Omitted)

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| <ul style="list-style-type: none"> 8—Control-power switch. 9—Machine-resistor short-circuiting contactor. 10—Starting oil circuit breaker. 11—Control-power transformer. 12—Overspeed limit switch. 13—Synchronous-speed relay. 15—Direct-current-line circuit breaker. 16—Running oil circuit breaker. 16b—Auxiliary switch on No. 16. 16x—Interlocking relay for No. 16. 18—Direct-current-line contactor. | <ul style="list-style-type: none"> 28—Alternating-current-overload time-delay relay, hand reset. 29—Direct-current reverse-power relay. 30—Field relay. 32—Single-phase starting relay. 34—Master switch. 39—Generator field-killing contactor. 40—Synchronous-motor field-resistor contactor. 41—Synchronous-motor field contactor. 42—Compensator-magnetizing oil circuit breaker. 49—Alternating-current-machine temperature relay. | <ul style="list-style-type: none"> 50—Motor-operated field rheostat. 53—Exciter relay. 54—Quick-acting circuit breaker. 56—Direct-current reverse-power and underload relay. 57—Direct-current load-regulating relay, two coils. 64—Direct-current grounding protective relay. 68x-1—One contact of auxiliary relay for direct-current-machine temperature relay. 128—Compensator line time-delay overload relay. |
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special thermal relays function for this purpose. On moderate overloads the "hot" contacts of one of these close, energizing an auxiliary relay (68x), which cuts in a potential coil of the d.c. load-regulating relay mentioned earlier and causes the load to drop to such an amount that the machine will cool to a safe temperature.

If the overload should still continue the other relay makes its "hot" contact and opens the d.c. line contactor. These relays of course operate in connection with a thermostatic element.



Another View of the Switchboard Corner, with the Field-Boosting Motor-Generator Set in the Foreground

Connection to the d.c. bus at less than the proper voltage is prevented by the d.c. voltage equalizing relay, mentioned earlier. The d.c. line contactor will not close until two contacts of this relay are closed by the voltage of the generator rising slightly above the bus voltage.

The relay functions not only during starting sequences but at any time when the generator is to be reconnected to the bus.

ENGINEERS OF RAILROAD CO-OPERATED IN SUBSTATION WORK

The new equipment was installed under the general direction of the chief engineer of the railroad company, George W. Kittredge. J. W. Pfau, engineer of construction, had charge of the building and foundations; while the heavy shoring and foundations for the overhead viaduct structure were under the direction of Francis Boardman, division engineer. The electrical design and installation were in charge of E. B. Katté, chief engineer of electric traction, and his associates C. B. Martin, transmission engineer; C. P. Ferguson, assistant engineer, and H. W. Walsh, inspector at the site of erection.

Oil Consumption in St. Louis

IN an article entitled "Waste Saturation Plant Halves Oil Consumption, in the April 21, 1923, issue of this paper, page 676, the statement is made that the oil consumption in St. Louis has been reduced from 4,000 to 2,000 gal. per year. The actual reduction was from 4,000 to 2,000 gal. per month. This gives for 1922, the year to which the lower consumption applies and during which the car-mileage was about 43,000,000, a mileage of about 1,800 per gallon.

Passenger Platforms Relieve Confusion in Easton, Pa.

THE center square of Easton, Pa., is popularly known as the "Circle." Eight electric lines of the Easton division of the Lehigh Valley Transit Company enter this circle and leave by the same street, passing entirely around the loop. Formerly passengers boarded these cars at the various corners and thus from four to six stops were made on the loop. To relieve the congestion and confusion of this arrangement a platform has been installed in each of the quadrants of the circle. The cars of two lines stop at each platform, so that but one stop is required in the circle for each car. A conspicuous illuminated sign at the center of each platform gives the names of the lines assigned to it, and each station has a designating number, so that policemen and traffic officers can direct people by telling them the numbers of the stations at which their cars will stop.

The platforms are made in sections 21 ft. long by 8 ft. wide, and they are 5 in. above the street pavement. The flooring of the platform is laid diagonally, as experience has shown that most travel is either longitudinal or crosswise of the platform. With diagonal flooring there is less danger of slipping than when people travel in the direction of the boards. Space is left between the individual boards for drainage and for dirt to fall through. The underframing is of 2-in. x 4-in. and 3-in. x 4-in. timber brush-treated with creosote. The top boards are 1 in. x 4 in. A guard chain with stanchions extends along the outside edge. The stanchions consist of pipe posts with large base castings.

Where lines have both local and limited service, this is designated on the sign. The sign is of white glass with black letters, and lamps are installed inside for illuminating them. The sign is also fitted with a globe and light on top for giving illumination to the platform.



Loading Platform in the Circle, Easton, Pa.

A pipe stanchion supports the sign, and the wiring passes through this to the ground connection. The upright is of 2½-in. pipe and a 3-in. pipe is set in the concrete, so that the upper pipe fits inside of this and is held in place by set screws. The sign and stanchions can thus be readily removed for repairs.

The illustration shows No. 3 platform, at which lines for College Hill, Bethlehem, and Allentown stop.

Bootlegging Jitney Rides in Buffalo



An Amazing Story of How Jitneys Are Being Operated Contrary to the State Transportation Law—They Are Gradually Being Put Out of Business, but It Is Thought that 500 Remain of the 5,000 Which Once Were Operating

These illustrations were taken some time ago when the jitneys were advertising their service. The one at the left shows a jitney displaying its city permit for Route No. 5, which is the Niagara Street route. The illustration to the right shows the former principal down-town terminal for jitneys, with an index of the route numbers displayed by the jitneys and the streets over which they were operating at that time.



ALTHOUGH normal street car service has been restored on the local and interurban lines of the International Railway Company, Buffalo, there are still a number of persons in that city who are in sympathy with the platform employees who have been on strike since July 1, 1922. These sympathizers make the boast that they will never ride on the cars until the men return to work. While every effort is being made by private detectives in the employ of the International to check jitney competition, it is estimated that more than 500 privately-owned automobiles are engaged in the jitney business in Buffalo. These jitneys charge a 10-cent fare and probably collect in fares daily at least \$10 each or \$5,000 a day in toto.

When the strike of platform employees went into effect on the local and interurban lines of the International almost a year ago, Mayor Frank X. Schwab announced that emergency jitney permits would be issued at the office of the city's chief executive in the City Hall. Thousands of would-be jitney operators stormed the City Hall during the next forty-eight hours seeking permits, and more than 5,000 were granted.

Each person to whom a permit was issued was required to promise that he would operate over a specified route and the fare charged would be not more than 10 cents. A numbered permit was issued to each applicant, and the name and address of each jitney owner was filed with the police department, together with the make of the machine and its carrying capacity. The permit was displayed on the windshield of each jitney, together with a sign giving the route over which the jitney operated.

Within twenty-four hours after there was complete suspension of service on the lines of the International privately-owned jitneys were carrying upward of 750,000 passengers daily and many drivers were boasting that they had a daily income of \$40 and \$50. Terminals were established at downtown corners by the order of the police department, and Mayor Schwab swore in fifty striking employees as special policemen to act as traffic officers at jitney loading points. Hundreds of other strikers bought automobiles on the partial-payment plan and started to engage in the hauling of passengers for a 10-cent fare. It is said that

many strikers took in enough money in the first month of the strike to pay for their cars and operating expenses, and by the end of the summer hundreds of strikers had substantial bank accounts because they found the jitney business profitable

JITNEYS OPERATE IN SPITE OF STATE LAW

When the International Railway began to expand its service with the new employees which it had recruited and to operate cars on various local lines throughout the city, the legal department of the company was confronted with the problem of attempting to rid the streets of the thousands of jitneys. The traction company encountered opposition on every hand, because the chief executive officer of the city largely had control of the situation and he was determined to keep the jitneys in operation.

Application was made to a justice of the Supreme Court for a writ of mandamus directing the Mayor as head of the Department of Public Safety to enforce the law against jitney operation. Counsel for the traction company argued that service was being given on all lines of the company on a normal basis, yet the municipal authorities allowed jitneys to operate without the authority of the Public Service Commission in violation of the transportation law. The writ of mandamus was granted and the Mayor withdrew the emergency permits, but the jitneys continued to operate even on a more extensive scale than before.

The service was not given by buses but by passenger automobiles of various makes and ages. These cars appeared in the streets without jitney license numbers and without route designations, but attempted to get around the law by carrying such signs as, "Going Out Main," "Ride Out Genesee," "We Stop Along Elmwood," "My Home Is on Niagara Street," etc. These signs appeared pasted on the windshields of cars in all parts of the city. The police made no effort to stop this illegal jitney competition.

The legal department of the International found it was facing a very difficult problem, and the entire claims department of the International and many of the officials of the claims department of the Philadelphia Rapid Transit Company were assigned to jitney duty

in Buffalo. Scores of men worked day and night in an effort to put an end to this unfair competition and so successful were their efforts that today fewer than 500 jitneys are in operation and they are making every effort to conceal their identity and avoid arrest.

Finding that the mandamus proceedings directed against the Mayor were of little effect, the International Railway placed checkers at dozens of street corners to get the license numbers of cars suspected of being jitneys. After careful checking it was easy to determine what cars were being operated back and forth along certain streets. Then application was made to the courts for injunctions restraining the car owners from operating their machines as jitneys in violation of the state transportation act. The service of these thousands of injunctions was a big task, but it had a tendency to scare many jitney drivers into ceasing operations.

The work of the secret service department of the International Railway with the aid of operatives from the Philadelphia Rapid Transit Company continued and the checking was renewed. Men were detailed to ride the jitneys and obtain evidence against individual drivers. The men worked in pairs so that the testimony of one would corroborate that of the other. The jitney drivers then grew suspicious when two men attempted to board their car at a given point, so a man and woman detective were paired off and much evidence was obtained in this manner.

NEARLY TWO THOUSAND WARRANTS WERE ISSUED

When the legal department of the International was satisfied that automobile owners were violating the injunction and there was sufficient evidence that they were operating in competition with the local lines of the International on a 10-cent fare, application was made to judges of the Supreme Court for warrants of arrest for contempt of court. Almost 2,000 such warrants were issued. The company found it an exceedingly difficult task to serve these Supreme Court warrants, but when they were served and the jitney owners were taken into custody by International detectives fines of \$250 and ten days imprisonment were imposed.

After several heavy fines and penitentiary sentences had been imposed, there was a noticeable drop in the number of jitneys being operated in Buffalo. The campaign is being continued, and now the jitney owners are being arraigned in City Court on charges of operating a bus line without obtaining certificates of convenience and necessity from the Public Service Commission. More than 700 jitney drivers have been arrested and most of them have demanded jury trials, so that at least 500 such cases are now pending in the City Court.

The International has been having some difficulty in prosecuting these cases because the evidence against them was obtained probably months ago and the detectives who were then working on the case have left the city or are no longer in the employ of the railway company. Many jitney owners have been arrested four and five times, apparently willing to pay a fine and consider it part of the cost of operation. In a large number of instances convicted jitney owners have paid their fines with dimes and nickels. In one instance when a jitney driver was found guilty and fined \$250, he laughed and offered to pay the fine in small change. The judge was impressed with the large amount of silver being counted so he ordered the jitney driver

locked up until the money could be counted. The judge told the clerk to be in no hurry to count the money so the jitney driver was in the lockup thirty-six hours before he was informed that he had given the correct amount of change to pay his \$250 fine.

EVIDENCE IS GETTING MORE AND MORE DIFFICULT TO OBTAIN

With the arrest and conviction of so many jitney owners and drivers, it is getting more and more difficult to secure the necessary evidence against suspects. Detectives, however, continue to make attempts to obtain rides and ask the rate of fare. In some instances the jitney drivers say there is no charge for the ride, but "leave your donation on the rear seat." Other jitneys display a small box attached to the driver's seat saying, "Poor Box," "For the Benefit of Strikers," etc.

The jitney owners have been subjected to so much prosecution that they have organized an association. Membership in it provides the driver with an attorney in case he is arrested, and the application of the association for certificates of convenience and necessity from the Public Service Commission was recently rejected.

Many tricks have been tried by the jitney drivers in their attempt to evade the law. One recent attempt was nipped in the bud by the traction company. It provided for the organization of a social society with weekly dues of \$1 entitling the members to a weekly pass on any jitney in the city. The court ruled this was merely an attempt on the part of the jitney owners and drivers to evade the law.

It is estimated that fully 70 per cent of all jitney owners and drivers brought into court are convicted. Few of them plead guilty, but figures available in the records of the City Court show that about 5 per cent enter pleas of guilty. The others demand jury trials. In almost every instance where jitney drivers have been taken into custody on warrants charging contempt of court they have been found guilty. Judges of the City Court and Supreme Court justices have been co-operating in an effort to stamp out this illegal competition with the International.

The city law department took an appeal from the writ of mandamus issued during the early days of jitney competition and the contentions of the city were upheld by the higher courts. It was ruled that the Mayor could issue such permits during a strike emergency. The contentions of the International Railway, however, have been upheld in other decisions of the Appellate Division and the New York State Court of Appeals in its efforts to stop unfair jitney competition.

Changes in Cost of Living

ACCORDING to the Bureau of Labor Statistics of the U. S. Department of Labor changes in the total cost of living in various cities throughout the United States from December, 1922, to March, 1923, show variations from a decrease of 2.9 per cent to an increase of 0.8 per cent, the average for the United States being a decrease of 4.4 per cent.

In thirty-two of the leading cities the decrease in cost of living from June, 1920, to March, 1923, averaged 22 per cent. The decrease was greatest in Savannah, Ga., where it was 25.1 per cent, and it was least in Los Angeles, being but 14.3 per cent. For the year from March, 1922, to March, 1923, the changes were all the

way from an increase of 3.8 per cent in Indianapolis to a decrease of 3.3 per cent in Seattle. For the period from December, 1922, to March, 1923, the range was considerably smaller, the maximum increase being 0.8 per cent in Memphis and the maximum decrease 2.9 per cent in Seattle.

Detroit Trial Board Works Well

All Cases of Dismissal from the Ranks of the Platform Men Come Before Board for Final Decision—Method of Handling Cases Outlined

ON THE Detroit municipal railway no platform employees are discharged until their cases have been considered by a board of three, known as the trial board. The general manager of the company, or, in his absence, the assistant general manager, is chairman of the board. The superintendent of transportation is one of the other members. The third member is some department head, and the effort is made to enlist in this service the heads of the different departments of the company in rotation.

Cases come before the board upon the application of a division superintendent who has authority to suspend the man from service but not to discharge him.

| CITY OF DETROIT Department of Street Railways | |
|--------------------------------------------------|--------------------------------------------------------------------------------------|
| Line | Date |
| CONDUCTOR | Badge No. |
| Miscellaneous | |
| Reprimanded for () | missing car not open. |
| Reprimanded for () | not making report of accident. |
| Reprimanded for () | allowing passengers to ride on the rear platform of Pre-payment car. |
| Reprimanded for () | allowing passengers to alight rear platform of car. |
| Reprimanded for () | allowing passengers to alight outside of rear door. |
| Reprimanded for () | not being on rear platform while holding car. |
| Reprimanded for () | not holding trolley rope while running under tow-out work. |
| Reprimanded for () | allowing passengers to board Pre-payment car through front door. |
| Reprimanded for () | allowing passengers to ride in vestibule. |
| Reprimanded for () | allowing passengers to obstruct front entrance of car. |
| Reprimanded for () | not holding car doors. |
| Reprimanded for () | not carrying books and door cloth. |
| Reprimanded for () | smelly breath. |
| Reprimanded for () | allowing fire to go out. |
| Reprimanded for () | not properly signalling car. |
| Reprimanded for () | not reporting defective car. |
| Reprimanded for () | operating car at an excessive rate of speed through switches. |
| Reprimanded for () | operating car at an excessive rate of speed around curves. |
| Reprimanded for () | operating car at an excessive rate of speed over inter-locks. |
| Reprimanded for () | following the car ahead too closely. |
| Reprimanded for () | not raising car on turn. |
| Reprimanded for () | not leaving terminals on scheduled time. |
| Reprimanded for () | copying schedule incorrectly. |
| Reprimanded for () | annoyingly detouring car. |
| Reprimanded for () | running by passengers. |
| Reprimanded for () | not holding safety stop at street railway crossing. |
| Reprimanded for () | not properly protecting street railroad crossing. |
| Reprimanded for () | proceeding over street railroad crossing without conductor's proper protected order. |
| Reprimanded for () | not holding safety stop at street railway crossing. |

| | |
|---------------------|-------------------------------------------------------------------------------------------------|
| Reprimanded for () | signalling customers to proceed before the car had made safety stop at street railway crossing. |
| Reprimanded for () | excessive drinking. |
| Reprimanded for () | missing station while in full uniform. |
| Reprimanded for () | leaving vehicle just before going on duty. |
| Reprimanded for () | failing to account for all fares collected. |
| Reprimanded for () | not registering fares. |
| Reprimanded for () | failing to react register. |
| Reprimanded for () | missing fares. |
| Reprimanded for () | not registering fares promptly. |
| Reprimanded for () | not collecting fare promptly. |
| Reprimanded for () | failing to register all fares on Pre-payment cars. |
| Reprimanded for () | retaining in passengers the full amount of change on Pre-payment car. |
| Reprimanded for () | not allowing passengers to deposit their own fare on Pre-payment car. |
| Reprimanded for () | not filling out and not depositing passenger's refund slip in first box on Pre-payment car. |
| Reprimanded for () | discourteous treatment to passengers. |
| Reprimanded for () | scripping seats, while on duty, while passengers stand. |
| Reprimanded for () | making errors on trip slips. |
| Reprimanded for () | not turning in envelopes containing trip returns. |
| Reprimanded for () | making errors in filling out trip envelopes. |
| Reprimanded for () | pushing transfers incorrectly. |
| Reprimanded for () | not turning in amount transfers. |
| Reprimanded for () | not calling street and trolley stations. |
| Reprimanded for () | not having the required sum of money to operate car. |
| Reprimanded for () | abusing such sum privilege. |
| Reprimanded for () | holding unnecessary conversation with passengers. |
| Reprimanded for () | talking to motorman while on duty. |
| Reprimanded for () | talking to conductor while on duty. |
| Reprimanded for () | riding in car while same is in motion. |
| Reprimanded for () | running into open points. |
| Reprimanded for () | not displaying the proper route sign. |
| Reprimanded for () | not displaying the proper destination sign. |
| Reprimanded for () | shading board signs while car is in motion. |
| Reprimanded for () | not raising and observing bulletin orders. |
| Reprimanded for () | not being in regulation uniform. |
| Reprimanded for () | maintaining unsatisfactory appearance. |
| Reprimanded for () | not holding meter properly. |
| Reprimanded for () | operating black light improperly. |
| Reprimanded for () | making errors in train orders. |
| Reprimanded for () | not observing signals and order boards. |
| Reprimanded for () | not exchanging signals properly. |

Front and Back of Sheet Used to List Reprimands of Employees

Promptly after he is suspended the superintendent forwards to the superintendent of transportation a report on a regular form provided. This gives the name of the employee, his residence address, badge number, line, etc., date of the suspension, and detailed information as to the offense for which dismissal is requested.

Notice that the trial board will take up any particular case is sent to the suspended employee so that he can be present in person, and also to the division superintendent so that he can be present or represented. If the suspended employee fails to appear before the trial board without due cause, he is automatically discharged, or if he declares to the division superintendent when being suspended that he does not wish to appear before the trial board, he is required to sign a resignation and this resignation is forwarded to the trial board. When an employee is under suspension, his outfit is not taken up unless he resigns.

The evidence considered by the board consists not only of such verbal or written statements as the division

TABLE SHOWING COMPARATIVE MONTHLY REPORT OF ACTIVITIES FOR JANUARY, 1923, AND FEBRUARY, 1923, OF TRANSPORTATION DIVISION, DEPARTMENT OF STREET RAILWAYS, DETROIT

Revenue car-miles in January..... 4,285,160.78
Revenue car-miles in February..... 3,953,915.27

Decrease in February..... 331,245.51

| | Total in January | Total in February | Increase Over January | Decrease Under January |
|---------------------------------------------------------------|------------------|-------------------|-----------------------|------------------------|
| New Service Schedules | | | | |
| Put into effect..... | 36 | 28 | | 8 |
| Prepared..... | 38 | 32 | | 6 |
| Platform Men | | | | |
| Qualified..... | 392 | 345 | | 47 |
| Not finishing practice..... | 146 | 143 | | 3 |
| Dismissed on account of unsatisfactory reference letters..... | 8 | 8 | 0 | 0 |
| Under instruction end of month..... | 210 | 165 | | 45 |
| Failing to pass doctor..... | 111 | 63 | | 48 |
| Not reporting to doctor..... | | | | |
| Transferred..... | 45 | 21 | | 24 |
| Operators resigned..... | 71 | 72 | 1 | |
| Conductors resigned..... | 63 | 68 | 5 | |
| Total resigned..... | 134 | 140 | 6 | |
| Operators dismissed by trial board..... | 4 | 7 | 3 | |
| Conductors dismissed by trial board..... | 4 | 7 | 3 | |
| Total dismissed by trial board..... | 8 | 14 | 6 | |
| Grand total left service..... | 142 | 154 | 12 | |
| Force at End of Month | | | | |
| Operators on board..... | 1,906 | 1,998 | 92 | |
| Conductors on board..... | 1,808 | 1,919 | 111 | |
| Platform employees on board..... | 3,714 | 3,917 | 203 | |
| Carhouse and terminal employees..... | 275 | 281 | 6 | |
| Division superintendents' supervisory force..... | 43 | 43 | 0 | 0 |
| Main office and miscellaneous employees..... | 50 | 51 | 1 | |
| Total force..... | 4,082 | 4,292 | 210 | |

Complaints

Received at City Hall office either by mail or telephone, re:

| | | | | |
|----------------------------------|----|----|---|----|
| Passing up passengers..... | 21 | 11 | | 10 |
| Transfers issued improperly..... | 6 | 9 | 3 | |
| Service..... | 5 | 6 | 1 | |
| Discourtesy of employee..... | 10 | 4 | | 6 |
| Negligence of employee..... | 10 | 6 | | 4 |
| Transfer controversies..... | 8 | 7 | | 1 |
| Dispute over fares..... | 4 | 4 | 0 | 0 |
| Heat and ventilation..... | 0 | 3 | 3 | |
| Miscellaneous..... | 10 | 6 | | 4 |
| Total..... | 74 | 56 | | 18 |

Received at Main Office, re:

| | | | | |
|----------------------------------|-----|-----|---|----|
| Passing up passengers..... | 46 | 51 | 5 | |
| Transfers improperly issued..... | 13 | 12 | | 1 |
| Service..... | 41 | 25 | | 16 |
| Discourtesy of employee..... | 40 | 32 | | 8 |
| Negligence of employee..... | 58 | 55 | | 3 |
| Transfer controversies..... | 22 | 26 | 4 | |
| Dispute over fares..... | 11 | 9 | | 2 |
| Heat and ventilation..... | 4 | 2 | | 2 |
| Miscellaneous..... | 8 | 10 | 2 | |
| Total..... | 243 | 222 | | 21 |

Grand total all complaints..... 317 278 39

Commendations of employees

| | | | | |
|-----------------------------------|----|---|--|---|
| Received at City Hall Office..... | 2 | 0 | | 2 |
| Received at main office..... | 13 | 9 | | 4 |
| Total..... | 15 | 9 | | 6 |

Suggestions

| | | | | |
|-----------------------------------|----|----|--|----|
| Received at City Hall office..... | 7 | 1 | | 6 |
| Received at main office..... | 38 | 29 | | 9 |
| Total..... | 45 | 30 | | 15 |

Lost articles

| | | | | |
|-----------------------------------------|-------|-------|--|-----|
| Received..... | 1,453 | 1,264 | | 89 |
| Claimed at carhouses..... | 128 | 114 | | 14 |
| Claimed at lost article department..... | 328 | 245 | | 83 |
| Total claimed..... | 456 | 359 | | 97 |
| Returned to finder..... | 1,052 | 943 | | 109 |

Money at Lost Article Department

| | | | | |
|-----------------------------------------|----------|----------|--------|----------|
| Received..... | \$832.44 | \$494.90 | | \$337.54 |
| Claimed at carhouses..... | 136.15 | 267.91 | 131.76 | |
| Claimed at lost article department..... | 608.67 | 146.91 | | 461.76 |
| Total claimed..... | 744.82 | 414.82 | | 330.00 |
| Returned to finder..... | 180.18 | 95.44 | | 84.74 |
| Notification postal cards sent out..... | 163 | 134 | | 29 |

Calls (In person or by phone)

| | | | | |
|---------------------|-------|-------|--|-----|
| At City Hall Office | | | | |
| In person..... | 1,772 | 1,040 | | 732 |
| By phone..... | 573 | 454 | | 119 |
| Total..... | 2,345 | 1,494 | | 851 |

At Lost Article Department

| | | | | |
|----------------|-----|-----|--|-----|
| In person..... | 351 | 338 | | 13 |
| By phone..... | 613 | 515 | | 98 |
| Total..... | 964 | 853 | | 111 |

Total at both downtown offices

| | | | | |
|----------------|-------|-------|--|-----|
| In person..... | 2,123 | 1,378 | | 745 |
| By phone..... | 1,186 | 969 | | 217 |

Grand total, all calls at downtown offices..... 3,309 2,347 962

| | | | | |
|------------------------------------|-------|-----|---|-----|
| Maps sold by City Hall office..... | 1,005 | 700 | | 305 |
| Passenger stops established..... | 16 | 4 | | 14 |
| Passenger stops discontinued..... | 7 | 7 | 0 | 0 |

superintendent and employee wish to make, but also all documents relating to the complaint, accident, or whatever the reason for the hearing by the board, and all papers relating to the past performance of the employee. This file is collected and submitted to the board by the chief of the intelligence bureau.

After the board has taken action on the case a bulletin is issued and posted in all carhouses stating the charges which were made and the action taken by the board in each case. A copy of this bulletin is also filed with the record of each employee whose case was brought before the trial board.

If an employee is reinstated after being suspended, his seniority and rating continue, the board deciding whether he shall be paid for full time or part time during the period of suspension. Employees who have resigned under the conditions of suspension already mentioned, or who have been discharged by the board, are not re-employed unless the case comes again before the board and authority for re-employment is given. The ex-employee must also make written request to have the board authorize his re-employment if he wishes again to work on the system.

A blank found convenient for keeping records of reprimand and forming part of the employee's record, already mentioned, is reproduced.

All complaints sent in relating to employees are investigated personally before they go definitely against a man's record. Each month a table is made up giving a list of the number of the different kinds of complaints, as well as of commendations and suggestions received from the public, and this table forms a part of the records of the transportation division, with other data called its "comparative monthly report of activities." The monthly report of this kind for January and February, 1923, is published in the accompanying table.

Cleveland and Interurbans Agree

The Latest Form of Contract for Interurban Cars Entering the City Over the City Tracks Is Published in Full

THERE is so much interest in the subject of contracts between interurban and city roads by which interurban cars enter the city over the city tracks that the form of contract recently adopted by the Cleveland Railway for passenger cars is presented in full. This particular contract was made with the Northern Ohio Traction & Light Company, which operates the line from Cleveland to Akron and was signed last December, but there are similar contracts between the Cleveland Railway and the other interurbans entering Cleveland.

These contracts replace those made about twenty-five years ago. Most of these were for twenty-five years and have expired or are expiring. Under this former contract the Cleveland Railway took all of the fares for the city rides, paid all of the expenses and recompensed the interurban railway at the rate of 2 cents per car-mile for the use of its cars. The only expense assumed by the interurban railway was that of ordinary car maintenance. The new contract follows:

This Agreement, made and entered into this first day of December, 1922, by and between the Cleveland Railway, party of the first part, and the Northern Ohio Traction & Light Company, party of the second part, both being electric railway corporations organized and existing under and by virtue of the laws of the state of Ohio, witnesses that:

Whereas it is the mutual desire of the parties hereto that the party of the first part operate all cars owned by the

party of the second part between the point of physical connection of the tracks of the two parties and any point on the lines of the party of the first part which may be the destination of such cars and whereas the operation of freight, express, work and other cars on the lines of the party of the first part are subject to and governed by other agreements, franchises and rules, this agreement is limited to and affects only the operation of passenger cars;

Now, therefore, the parties hereto have agreed, and do hereby agree, as follows:

ARTICLE I

The party of the first part agrees:

1. To accept all scheduled, extra or special passenger cars in good condition tendered it by the party of the second part at or near a point about 4,210 ft. southerly from the intersection of Miles Avenue and Broadway on the private right of way of both companies in front of the Calvary Cemetery (the point of physical connection of the tracks of the parties hereto), and to operate them over such routes and to such points as may be agreed upon by the parties hereto or fixed by the Council of the city of Cleveland, and to return cars to the party of the second part in like good operating condition, necessary wear and tear excepted.

2. To charge, collect and retain all fares from and to the points herein named as provided in ordinance of the city of Cleveland, File No. 53779, adopted Dec. 13, 1920.

3. To assume and pay all expenses of operation of cars from and to the points of physical connection.

4. To credit party of the second part with all fares received by it and to account for same monthly.

5. To render, monthly, invoices for all mileage operated under this agreement at the rate of 35 cents per car-mile, less credits made as provided in Sec. 4 hereof.

6. To pay to the party of the second part the sum by which the receipts for each year of this agreement exceed 35 cents for each car-mile operated during that year, if there be such excess; provided, however, that this sum shall not be greater than 5 cents per car-mile operated under this agreement, and to retain all, if any, excess above 40 cents for each car-mile so operated.

ARTICLE II

The party of the second part agrees:

1. To deliver all scheduled, extra or special passenger cars to the party of the first part in good operating condition.

2. To report promptly to the party of the first part all accidents occurring out of the operation of cars under this agreement known to the party of the second part, and to assume and pay any and all expense caused by failure to make such reports.

3. To furnish, monthly, to the party of the first part schedule of regular runs and to report any changes therein promptly to the party of the first part.

4. To report, daily, all trips of extra and special cars and to forward trip-sheets and registered readings to the party of the first part each day.

5. To pay 50 cents per car for each day or part thereof any of its cars are stored on the property of the party of the first part.

ARTICLE III

The parties mutually agree:

1. That this agreement shall be for a period of five years, ending Nov. 30, 1927, and shall cease and terminate with that day.

2. That this agreement shall inure to the benefit of and be binding upon the parties hereto, their respective successors and assigns.

3. That the party of the first part shall receive not less than 35 cents for each car-mile operated under this contract and not more than 35 cents unless the earnings on such operation in any one year of this agreement shall exceed 40 cents per car-mile.

4. That the cars covered by this agreement are to be equipped with couplers and manned by crews acceptable to the operating officers of the party of the first part.

5. That all motormen and conductors operating cars under this agreement shall be under the immediate jurisdiction of the party of the first part, and discipline imposed by the party of the first part shall be final.

6. That all invoices shall be paid on or before the 20th of the month following the operation for which invoice is made.

7. That each party may have access to the records of the other so far as they relate to the carrying out of this agreement.

8. That this contract shall not be binding upon the Cleveland Railway unless and until approved by the Council of the city of Cleveland.

Carrying Safety to the Public—III*

How the Schools May Be Used as a Means to Reach the Entire Community—Proper Methods of Instruction of First Importance in Effective Safety Teaching

By C. W. Price

Vice-President in Charge of Public Safety,
Elliott Service Company, New York City



Safety Is Used Effectively as a Subject in the Drawing Class

IN ANY effort to reach an entire community with the safety idea, the secret of success is to utilize the existing civic agencies. The public and parochial schools offer by far the most effective agencies through which to impress large numbers of people. Half of all that can be done to reach not only the children but the adults will be done through systematic, daily instruction in safety in the schools. Electric railway executives long have appreciated the value to them of safety instruction.

For ten years safety had been taught in a systematic way in many schools, but with no appreciable results in reducing accidents. The method consisted usually of a ten-minute talk once a week, and a few posters.

Dr. E. George Payne of the department of Sociological Pedagogy of New York University first developed a successful plan of safety instruction in 1918 in the schools of St. Louis. More recently he has prepared complete material covering safety instruction, for the use of superintendents and principals, and monthly leaflets for teachers. This material is based on the experience in many schools in which successful work has been done.

The Payne plan does not add another subject for study to the already crowded curriculum; it provides for the use of a safety material in each of the studies already included. To illustrate: at least once each week in the drawing class each child designs a poster on safety. I have seen posters illustrating every kind of

hazard, from putting up a stove pipe while standing on a step ladder, to the right and wrong ways of alighting from a street car.

In the writing lessons the children copy such sentences as this: "When I start across the street, I look to the left, and when I get to the middle of the street, I look to the right."

Safety material, so the educators testify, lends itself to the teaching of reading and composition better than many of the standard kinds of material. It is found that in this use of safety material, the children get just as much drill in drawing, writing, reading and composition, and at the same time get valuable suggestions in safety.

In each school room a safety patrol, consisting of three to five children, is appointed to help keep its room on the banner list for freedom from accidents. One of the duties of this patrol is to guard the streets when school is dismissed, and to warn the children against crossing the streets when cars or automobiles are approaching.

In the schools of Cincinnati there are 13,000 "Safety Guards." Each child has been pledged individually to do three things: play safely, warn others, and, if opportunity offers, save human life. Some months ago a mother stepped out of her door and saw her two-year old baby boy toddling out on the railroad track. Then she saw that he had caught his foot in the frog. She looked up the track and saw a freight train backing down toward the child. She lost control of herself and

*The third of a series of ten articles.

began screaming. A boy 200 ft. down the track heard the screaming, rushed up, grabbed the child, tore the sole off of his shoe and rescued the little fellow just before the train reached him. Some one asked the boy, "Johnny, how did you come to do it?" He replied, "Well, I was playing down the track. When I heard the mother scream, I turned round and noticed the child, and I saw he was going to be killed. Then I remembered that I was a safety guard and had promised to save human life."

Now that boy had not only got the safety idea into his mind, but he had put into his very soul the sort of courage and unselfishness which we need in our future citizens.

Through the use of safety material in at least one study each day, and through the activity of the safety



This "Safety Patrol" Shows How Even the Smallest Kiddies Can Get the Idea

patrol, safety is made an active and vital part of the child's daily life. This is the secret of the success of the plan.

Three facts stand out in the experience of hundreds of schools in which safety instruction has been given successfully during the past four years:

First: Accidental deaths to children of school age have been reduced materially. In St. Louis, for instance, forty-nine school children were killed in 1919, and only twenty-five in 1922, in the face of a 45 per cent increase in automobiles. In Detroit deaths to school children were reduced from ninety-six to thirty in two years. In both of these cities systematic safety instruction was made a part of the school curriculum.

Second: Safety material has proved to be more vital, more interesting to the child, and more valuable from the standpoint of the education of the child, than the old material. The introduction of safety instruction is quite in line with the modern development of pedagogy. More and more the demand is coming among progressive educators for material which is vital and familiar to the child's daily life.

Parents are demanding that their children be equipped not only to cope with the environment in which they will live as adults, but with the present environment in which they are living as children. The prime consideration is to train the child, first, to preserve his life and limb, and second, to conserve his health.

Educators are also seeking to train the children in good citizenship. This can be done only by allowing the children to participate actively in work for the improvement of the community. Safety lends itself admirably to this training, better than do most other activities in which the children can engage.

Third: The most direct and effective means thus far discovered of reaching and convincing the adults of a community is through the message carried home by the school children to their parents. It is found when safety has been made a vital part of the daily school life, the children become enthusiastic advocates of safety in the home. Parents who might be indifferent to an outside appeal seldom will turn a deaf ear to the appeal of their own children for safety.

Employers of labor were among the first to see the

far-reaching value of safety instruction in the schools. They not only saw its vital bearing on public safety, but also its direct effect on industrial safety, appreciating that if the workmen were reached through their children and impressed with the safety idea, they would come back to their place of employment not only interested in safety as employees but as fathers and citizens convinced of its necessity.

Because of the widespread interest in most communities in safety, especially traffic safety, it is comparatively easy to persuade school authorities to adopt some form of safety instruction. It is much more difficult to persuade them to install the right plan of instruction, using safety material in the studies and organizing safety patrols. Unless they are fully informed regarding the details of the method, and are convinced that it is practical to make safety a vital part of the curriculum, they may adopt some poorly-planned method which will not get results. It is, therefore, advisable to place in the hands of the school authorities full information regarding the methods used and the results achieved in other cities.

It is found that many teachers are willing to teach safety, but are unable to do the most effective work unless suitable material is furnished. The Washington Safety Council has adopted a plan of furnishing a monthly bulletin to each teacher in the public and parochial schools. This bulletin contains a complete analysis, by causes, of the accidents of the previous month, along with a half dozen stories of accidents to children. Suggestions regarding points to be emphasized, and items regarding what various schools are doing, are also included.

What Is a Living Wage?

The Chairman of the Labor Board Tells Why It Did Not Attempt to Answer that Question

MUCH has been said about the need of a "living wage" in arbitration hearings during the past five years, but those who have attempted to decide impartially in dollars and cents just what this wage is, under American conditions, have found the task a difficult one. To begin with, the expression may mean to some people bare subsistence, to others it implies a greater modicum of comfort, while to a third group it may be considered to be an income sufficient to insure such savings as will provide support during ill health and old age. It is interesting, therefore, that Ben W. Hooper, chairman U. S. Railroad Labor Board, contributes an article to the June issue of the *Nation's Business* in which he discusses the entire subject, as it has been presented to that board.

It seems, to quote from Mr. Hooper's article, that during the railroad wage arbitrations the board was asked to fix for the unskilled and lowest-paid worker on the railroads a wage sufficient to maintain a family of five in health, decency, and reasonable comfort, and above this basic living wage to establish differentials for the higher grades of railroad workers, according to skill, hazard, responsibility, experience, training and productive efficiency. Thereupon, representatives of labor organizations presented budgets for such living, varying from \$1,750 to \$2,637 a year, with a figure prepared by the Bureau of Labor Statistics, \$2,133, part of the way between. These budgets were intended to cover only the basic wage which common labor required under the conditions specified. It was discovered, however, that when

the lowest of these scales was used for calculation, with the existing percentage differentials maintained for skilled labor, that their payment would have meant an annual deficit on the railroads of more than two and a quarter billion dollars, on the basis of the revenues of 1921. Still further calculation showed that if this annual income of \$1,750 had been received by each of the 25,000,000 families in the country, and it was thought that the employees of other industries were as justly entitled to it as were the railway employees, the total would be somewhat in excess of the latest estimate of the total annual income of the people of the United States. Finally, it was found by calculation that if the 25,000,000 families in the country should receive the highest scale mentioned for common labor, or \$2,637, the total would be nearly \$26,000,000,000 in excess of the country's total income. Mr. Hooper naturally says in his article in this connection: "Wonder where the excess would come from!"

These figures naturally led to a recast of the entire situation.

In the first place it was found that according to the census of 1920 there was in each family in the country an average of only 4.4 persons and not 5, an average of only 1.4 dependent children under sixteen years of

age and not 3, and an average of 1.36 male workers instead of 1, as assumed in a number of the budgets submitted to the board. The facts were also realized that the common laborer does not always have to remain in that capacity, that some of the comforts and conveniences which he might like to have necessarily must be deferred until thrift has resulted in accumulation, and a fair degree of contentment and even happiness may be enjoyed with a low wage under conditions of self-denial.

Finally, it was also pointed out that the transportation law, under which the board was appointed, does not require the board to determine what constitutes a "living wage," but wages that are just and reasonable, and Mr. Hooper points out that these words imply a wage which is just both to the railroad and the employees and consequently to the public at large. In conclusion, he says, in part:

It is by no means my purpose to indicate that laboring men on the railroads or elsewhere should be discouraged from rational efforts to improve their wages and working conditions. Standards of living have gradually advanced in this country and must continue to do so. It must not be forgotten, however, that the worst legacy left us by the war was that of wasteful and extravagant habits of living in all classes of our people. These cannot be expected as the normal standards of sensible and wholesome living.

Belt Lines Abandoned and Through Routes Established

Second Section of Beeler Report Recommends Revision of Practically Every Route in New Orleans—Four Through Routes, Seven Crosstown Routes and Express Service Are Features—Traffic Conditions Will Be Simplified

AS MENTIONED in the digest of the Beeler report on the New Orleans street railway situation published in this paper April 28, the survey included a plan for extensive rerouting of lines. Four main features will be accomplished by the rerouting. A set of through cross-city lines will be established, connecting important residence districts with industrial centers. These are the Tchoupitoulas-Gentilly, Tulane-St. Claude, Claiborne Avenue and Napoleon-Broad lines. At least three of these lines undoubtedly will prove to be most important factors in the future growth of the city. Independent crosstown lines will be established, giving a type of service better fitted to the needs of the population and acting as feeders and distributors for the inbound and outbound lines. Express and semi-express service will be provided on certain routes, which have the advantage of operating over "neutral ground" for the greater part of their length, thus assuring more rapid transportation on certain important routes. In addition to the changes, the proposed routing will extend service into a dozen or more localities now entirely without or with only very limited facilities.

The proposed routing plan shows great simplification over the present. The turning movements are less and interlocking and duplication of routes are reduced. By operating crosstown lines exclusively as such, instead of endeavoring to furnish this kind of service with the ends of through lines, the proper type and amount of equipment can be placed where it will do the most good.

The length of route has been reduced, the average

round trip distance of each of the present routes being 9.03 miles, and of the proposed route 8.34. The length of run between layover points is reduced from the present figure of 7.37 to 5.73 miles.

According to the report, the present routing plan shows a duplication of routes in some localities and a lack of facilities in others. A futile attempt is made to give crosstown service by extending tail ends of trunk lines, accommodating a few at the expense of many. The belt lines, too, have a tendency to limit expansion, and their unbalanced loading is an objectionable feature. Many of the routes are indirect; their devious windings slow the car service and conflict with the movements of general traffic. The city of New Orleans has outgrown a system of routing that requires all car lines to concentrate in one heterogeneous tangle in the congested area.

The unequal distribution of service under present conditions is shown in the accompanying routing diagram. Some twenty-six lines are operated, all but one of which reach or run on Canal Street.

DETAILS OF THE PLAN

The most striking feature in this routing is the breaking up of two old-established belt line systems, the St. Charles and Tulane Avenue on one side of the city and the Canal Street and Esplanade Avenue on the other side. It was found that the traffic on these belts was badly unbalanced and that much service was being wasted on the light sections in order to handle the

business on the heavy sections. The proposed Tulane-St. Claude Avenue through line, which will take over the Tulane side of the St. Charles-Tulane belt, connects a very heavy residential district on the uptown side of the city with a large industrial district in the downtown section. In the past there has been a great deal of transferring in the vicinity of Canal Street, and it is anticipated that the establishment of this through line will reduce that to a minimum.

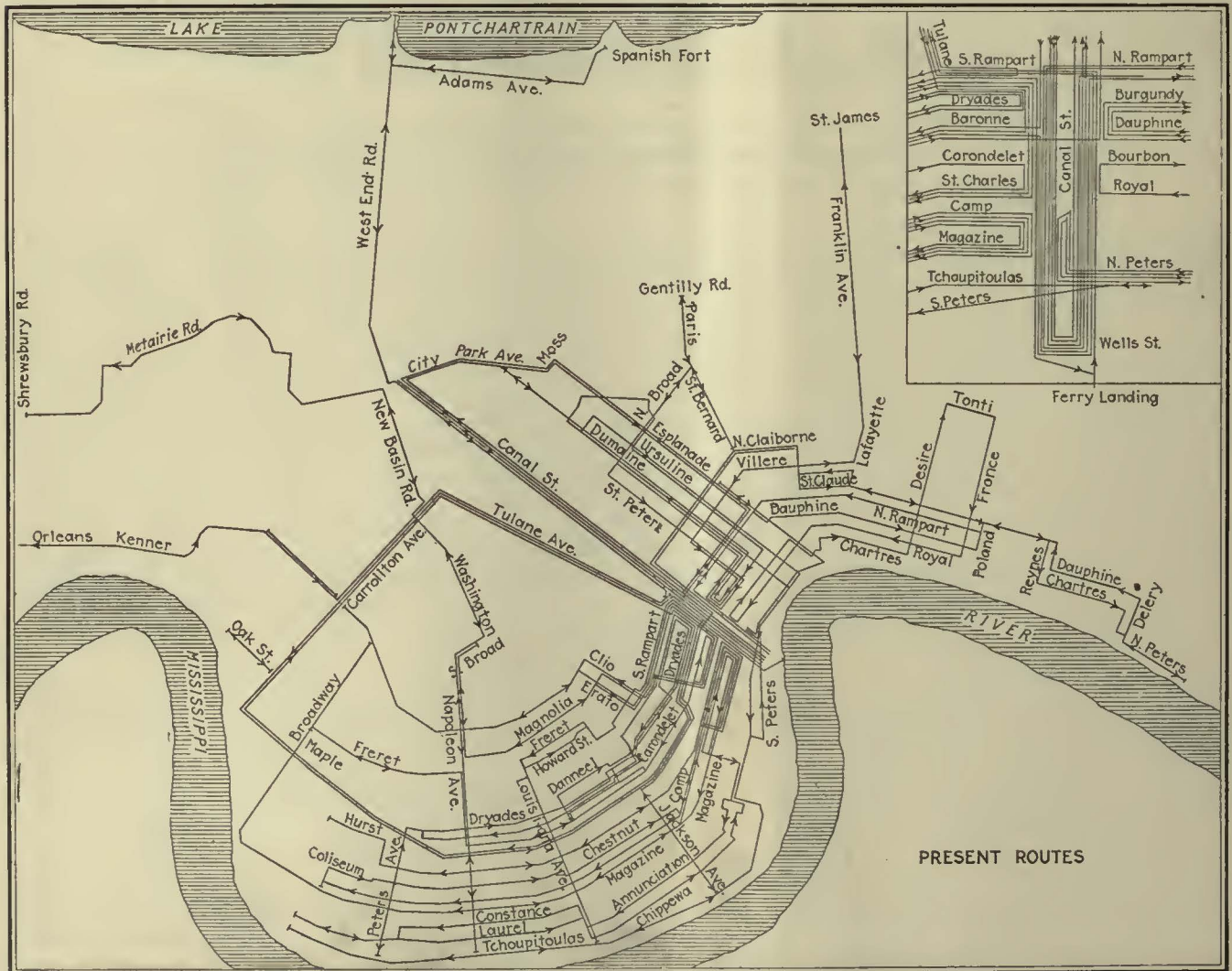
The Canal Street line, formerly one side of the Canal-Esplanade belt, will be given an independent service that may be more readily adjusted to care for the heavy volume of traffic here. It will be free from the difficulties at present encountered from the unbalanced traffic on Esplanade Avenue and the still lighter travel on City Park Avenue. Semi-express service is recommended for this line, the stopping places being two to three blocks apart.

The other side of the present belt line, operating principally on Esplanade Avenue, will be given a separate route coming in on Dauphine street. It will make a one-block-loop on Canal Street and go out on Burgundy Street. This will be a much lighter line than the Canal Street line and better fitted to the needs of its territory.

St. Charles Avenue, formerly covered by the St. Charles-Tulane belt line, will be given independent service by a new route operating on St. Charles Avenue from Carrollton Avenue to Canal Street. This route, operat-

ing midway between the river and Claiborne Avenue, is undoubtedly destined to be, considering its length, the heaviest car line in the city. It traverses for its full length the city's best residential section, affording direct connection to the retail business district. The population served is large and growing. Except for the comparatively short distance between Canal Street and Lee Circle the tracks are in the center of the "neutral ground," or center parkway, and free from all interference of street traffic except at the cross streets. Advantage should be taken of this condition to establish express service on this line. This will have many of the advantages of real rapid transit service, without some of the numerous disadvantages of an elevated or subway line. The location of the stopping places will have to be revised on St. Charles Avenue. From Carrollton to Lee Circle, a distance of 4.5 miles, there are at present seventy-six stopping places, or practically seventeen to the mile. It is proposed to reduce these to twenty, averaging a little more than a quarter of a mile apart. This will permit an increase in the schedule speed of 50 per cent in this section.

The general layout of the majority of the other lines will not be radically different from what it is at present, although a number of rearrangements of tracks have been made in order to eliminate unnecessary lines and to straighten out the remainder to give better distribution. The proposed changes in the track layout were



Present Routing of New Orleans Street Car Lines

described in the April 28 issue and are shown in the map on page 717.

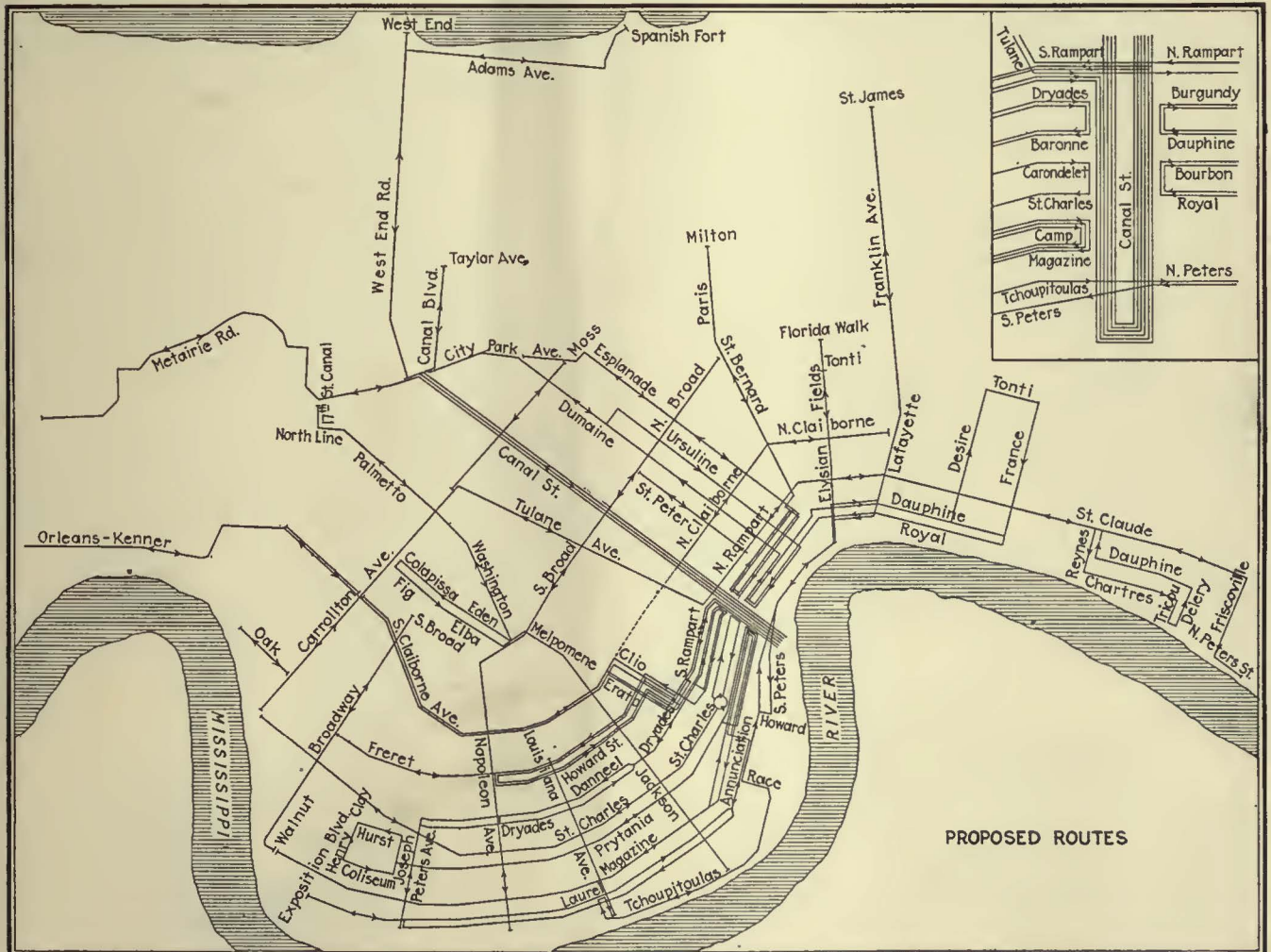
Apart from the through lines, the service reaching the business district will, in the main, be given by a series of lines terminating at or on Canal Street, as at present, but including a rearrangement which permits a material simplification of the Canal Street tracks. This is treated in a later section of the report.

A number of crosstown lines are recommended in addition to the through lines, which in themselves give a good deal of crosstown service. There are seven of these lines proposed, some of which are on existing tracks and some on tracks recommended for construction. They are the Carrollton Avenue, Broadway, Napoleon-Broad, Louisiana, Jackson, St. Peter and Elysian Fields lines.

Two lines operating beyond the main portion of the city have been given special treatment. The Spanish Fort line and the Orleans-Kenner interurban, which now terminate on South Rampart Street, just off Canal, are serious factors in the congestion at that point. It is recommended that the Spanish Fort line be continued down Canal Street to the river, where ample facilities for layover storage of trains required for the heavy excursion business are provided by the Wells Street loop and extra tracks at the foot of Canal Street. It is recommended that the Kenner interurban be terminated in the spacious neutral ground on Howard Avenue. This would give the interurban line an extension to the

central portion of the city without interfering too much with the local street cars and the general street traffic. This routing would also be more convenient to the majority of the riders. It would, of course, require the Orleans-Kenner line to change its track gage to 62½ in. from the present standard gage of 56½ in.

One feature of considerable importance is a rearrangement of traffic direction on the streets adjacent to Canal Street. Numerous plans have been tried in the past few years, but no comprehensive arrangement has been provided that will take care of the growing traffic. The report proposes that the streets from Rampart to the river alternate in traffic direction, and that the street cars follow the general direction of traffic. This has been extended so that the same traffic direction will apply on both sides of Canal Street. In the past in some cases the traffic has been reversed on the opposite sides of Canal Street, thus reducing the value of these streets. Baronne Street, which has been a two-way street, will be made to conform to the general plan. This necessitates the removal of the St. Charles Avenue line from this street, to which it has been confined because of the use of standard gage tracks. The St. Charles line, it is recommended, should enter the city in the downtown direction on Carondelet Street and return on St. Charles Street. This rearrangement of routes from the uptown section will equalize the street car traffic on these various streets and should reduce congestion materially.



Routing for New Orleans Proposed in Beeler Report

Federal Judge States Situation Impartially

While Ordering Receivers of Kansas City Railways to Rebuild Half-Million-Dollar Elevated Structure, Judge Kimbrough Stone Explains Clearly Why Railways Should Not Be Required to Carry Unnecessary Burdens

AN ELEVATED structure, owned by the Kansas City Railways and connecting the two Kansas Cities across the "West Bottoms" and the Kansas River, was recently condemned and railway service across it was discontinued in December, 1922. The railway, however, has been giving a partly equivalent service over the "Inter-City Viaduct" owned by the two cities. For this privilege the receivers pay \$30,000 per year.

On May 10, Judge Kimbrough Stone of the United States District Court for the western division of the western district of Missouri, on complaint of the Kansas City Refining Company, and after proper hearings, ordered the reconstruction of the elevated structure at a cost not to exceed approximately \$500,000 and on condition that the two cities relieve the railway of any obligation to use the viaduct and pay rental for the privilege of using it.*

Accompanying the order Judge Stone explained explicitly the local conditions leading to it. He pointed out also that as a general proposition the burdens placed upon an electric railway property which have no relation to the furnishing of its service to the public should be removed. These burdens consist of paving, viaduct building, street cleaning, license taxes and other like exactions. An abstract of part of his statement follows:

In the long-buried past exactions such as those mentioned were excusable if not, indeed, justifiable, but the conditions upon which such exactions originally rested have forever disappeared. Then every one used street cars because there was no other general means of city travel and the street railway companies, because of lack of strict regulation as to fares and earnings, could and often did make considerable earnings upon the investments. Under such conditions it was not unfair, either to the public or to the companies, to require payments of this character. They, usually, came out of the surplus earnings and constituted a form of indirect taxation.

Now, close public scrutiny and regulation of capitalization, earnings and fares prevent the companies from earning more than reasonable returns, even if street railway business conditions were such as to permit earning a surplus beyond such reasonable returns. But the business conditions now and permanently surrounding this business have affected and will continue to affect drastically the earning power of street railways. These changed business conditions are caused primarily and chiefly by the enormous

*Exceptions to this order were taken by the Continental & Commercial Trust & Savings Bank and E. F. Swinney, trustees under the first mortgage or deed of trust. Appeal was allowed to the Circuit Court of Appeals for the Eighth District and the appellants are given until June 10, 1923, to file assignments of error and bond.

use of private automobiles. The important effect of this element is shown by the circumstances that although the receivers of the Kansas City Railways are operating more cars over as much or more mileage as used in 1917 (shortly before the more general use of the private automobile began to be felt) and although the service is good and the public feeling toward the receivers seems favorable, yet the earnings, in subsequent years, of the business have never equalled those of 1917. In these two cities of approximately 500,000 people there are more than 50,000 licensed automobiles. Most of these are in daily use and much of that usage replaces what would otherwise be street-car travel. As the poorer classes of citizens only are compelled to use the street cars, the indirect taxes, such as those referred to above, now fall upon only a portion of the community, and this portion is made up largely of those least able to bear tax burdens. Therefore, these exactions are unfair and unjust to the public. Also, they aid in preventing, if they do not in themselves prevent, reductions of fare. In some cases they may necessitate raises in fare. They affect fares for the following reasons: The companies are entitled to receive a reasonable return on the fair value of the investment; the courts will enforce this constitutional right; the private automobile has made it very difficult for street railways to earn this reasonable return; the only substantial source of revenue is the fares; therefore, any substantial payments taken by the cities from the fare revenue are likely to be reflected in the rate of fare.

Under present and, so far as can be seen, future conditions there is but one way to secure for the people this transportation so vital to them and these communities, and to secure it upon a basis fair alike to public and serving company. That way is to relieve the business and its patrons from all of these burdens; let it confine its expenditures to furnishing good service and to paying those general taxes which all must bear; closely supervise service with a view of making and keeping it good; closely supervise all expenditures to secure economy in operation; closely supervise net earnings with a view of confining such to a reasonable return upon the fair value of the property; keep fares at the lowest point which will furnish the required service and the reasonable return.

How a Railway Can Help Out in an Emergency

THE accompanying views show how obsolete cars proved useful to house many members of a district devastated by fire. Last October an area of approximately 1,200 square miles in the woodlands some 300 miles north of Toronto, known as the Haileybury district, was swept by a forest fire, which rendered many of the inhabitants homeless. A committee known as the Northern Ontario Fire Relief Committee was organized, and eight days after the fire began, or on Oct. 12, the committee shipped to Haileybury eighty-five old cars which were formerly operated by the Toronto Railway to assist in providing temporary shelter to some of the families.

The views published below show three of the cars after they had been placed and fitted up with shades and stoves and otherwise made suitable for improvised houses for the refugees.



These Cars Made Very Comfortable Homes, Even in a Northern Latitude, in a District Which Had Been Swept by Fire

The Readers' Forum

More About Pavement Heaving Outside of Track Area

LEHIGH VALLEY TRANSIT COMPANY

ALLENTOWN, PA., May 8, 1923.

To the Editors:

The track construction described by A. Swartz on page 769 of the issue of the *ELECTRIC RAILWAY JOURNAL* for May 5, 1923, while very substantial, would seem not to take care of frost penetration along the edge of the adjoining highway. Mr. Swartz's letter was brought out by an article in the April 21 *JOURNAL*, page 677, in which certain construction in Allentown was described.

It is also a question whether the seepage that must occur within the track area and along the rails is taken care of, as no mention is made of any center drain to serve as an outlet.

We feel that the curb wall, to be effective, must be wholly outside of the track area, constituting a part of the adjoining roadway. The cost of this would be a part of the cost of the roadway, whereas in the case described by Mr. Swartz the railway assumes the full burden of what would seem to be rather expensive construction.

C. C. SMITH,

Engineer of Maintenance of Way.

[EDITORS' NOTE.—Mr. Smith's letter was forwarded to Mr. Swartz, who replied as below.]

TOLEDO & WESTERN RAILROAD

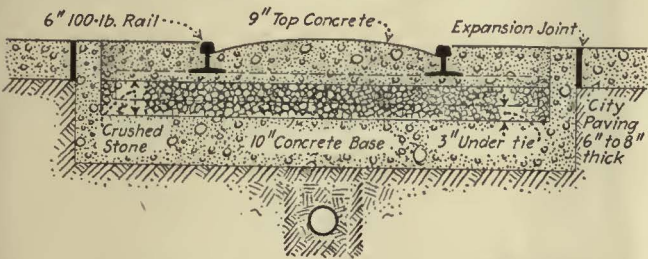
SYLVANIA, OHIO, May 15, 1923.

To the Editors:

I take pleasure in replying to the questions raised in Mr. Smith's letter as follows:

When I wrote the letter published in your issue for May 5 I was under the impression that the construction used in Allentown was practically identical with that which I described, but believe now it is not quite the same.

Our construction is shown in the accompanying cross-section, where it will be noted that we first built a



Cross-Section of Concrete-Trough Track Construction

trough in the shape of a channel which is entirely separated from the adjoining pavement on either side by means of the expansion joint. Theoretically, the cost of the curb wall ought to be a part of that of the city pavement, but our idea in paying for it was that if there should be any bad results to the paving outside the track the expansion joint would make so distinct a line of demarcation that there would be no question as to which party was responsible for the results.

The additional cost due to the use of the curb is

not great, and most municipalities would be willing to assume a portion of its cost and that of the expansion joint. I believe that the village of Metamora, mentioned in my letter, did assume a portion of this cost.

As for the frost penetration of the edge of the trough, the greatest detrimental results would be to the adjoining pavement and not to the track pavement. The railway company has no interest in the outside pavement if the municipality does not make its pavement of such depth as to resist frost.

As the Toledo & Western handles heavy freight traffic, the construction is so substantial that the bottom of the foundation is approximately 25 in. below the top of the pavement. This is below the average frost line in streets.

To take care of the seepage in the track area, we put in drainage outlets in the center of the track at intervals. In places where the subgrade is soft, it would be advisable to lay a drain tile in the center of the track strip, covering it with cinders and connecting it with the drainage outlets where they occur.

A. SWARTZ,

Manager for Receivers.

Number of Conductors on Three-Car Train Is Purely an Operating Question

DEPARTMENT OF STREET RAILWAYS

DETROIT, MICH., May 22, 1923.

To the Editors:

We note in your issue of May 12 the question of the number of operators required for our contemplated three-car-articulated train has brought forth some comment, and while we may overlook a bet sometimes, we have not in this instance. We cannot conceive at present of a more flexible unit for operator economy, as there is a free inclosed passage from car to car, thus allowing the placing of the three cars in charge of but one conductor. The number of conductors to be used is purely an operating matter, and will probably be determined after a careful study of traffic conditions, but if the maximum was decided upon there would still be a slight saving in man-power.

It may eventually be found that the density of traffic has some bearing on the advisability of reducing operator power to the minimum. On this question the past affords some guidance. Thus, when the first electric cars were found inadequate from the standpoint of size, there was an immediate switching to the heaviest street cars that could be built. When these were found to be expensive to operate, the other extreme in the single-truck safety car was supposed to end all trouble, regardless of service conditions. Experience with it hardly proves this to be true. The principle of determining the proper sphere of usefulness for the various ideas and using them in their places would have saved some money and worry in the past and perhaps may apply in the one-man car situation.

A. C. COLBY,

Superintendent of Equipment.

The Detroit municipal railway is putting in the hands of all its carhouse foremen a blueprint book giving miscellaneous information of help to them in specifying parts which they use. This information includes the names of parts of the trucks and car equipment which might give out, a list of the fuses used, etc. The purpose is to have a standard nomenclature on the system for these parts. The pages measure 8½ in. x 11 in.

Association News & Discussions

Collisions as the Motorman Sees Them*

Education of Automobile Drivers and Electric Railway Employees Is Necessary if the Collision Evil Is to Be Controlled—
Author Makes Concrete Suggestions

BY ELTON S. WILDE

General Manager Union Street Railway, New Bedford, Mass.

BEFORE discussing this topic let me submit, as a basis, the following figures obtained from the experience of the company with which I am associated:

"Of all the causes of collisions with autos, it seems to me that high speed on the part of one or both operators is the most frequent. If one is careful he usually can save the other fellow, but

MILES OPERATED PER ACCIDENT

| | 1910 | 1915 | 1920 | 1922 |
|------------------------------------------------------------------------------------|-----------|---------|--------|--------|
| Car collided with auto driving out of intersecting street, driveway or garage..... | 435,948 | 62,841 | 44,615 | 47,259 |
| Auto driving out of intersecting street, driveway or garage collided with car..... | 116,252 | 58,830 | 29,171 | 26,300 |
| Car and auto going in opposite directions on straight track collided..... | 348,758 | 95,346 | 32,622 | 37,807 |
| Car and auto going in same direction on straight track collided..... | 1,743,791 | 106,347 | 19,080 | 20,163 |
| Car while going around corner, taking curve or turnout, collided with auto..... | 249,113 | 230,419 | 50,564 | 57,067 |

To the classification "passenger car and automobile going in same direction on straight track" is assigned the cause of most of our auto accidents in New Bedford. These accidents, I may add, are caused mostly by our extremely narrow streets. Automobiles park alongside our tracks. Then without warning they turn into the track area, and we are very lucky if we only hit the automobile turning onto the track, for usually the one we hit is pushed or jammed into a second automobile parked ahead of it, thus causing damage to two automobiles.

I am sincere when I give as my opinion that the drivers of automobiles are more alert in preventing accidents today than the old time wagon driver. The old time driver had a partner in his horse, sometimes good and sometimes bad, but taking the automobiles and horse-drawn vehicles on an equal basis as to numbers I would rather take my personal chances with the automobile.

The analysis of Chauncey Hubbell of the State Registry of Motor Vehicles is interesting and bears out our own experience. He claims that in 1919 the ratio of deaths to automobile registration was 0.00223 and in 1922 it was 0.00113. In 1919 the same ratio was 0.06243 and last year it was 0.0331.

Holding no brief for the automobile driver and being on the other side of the fence, I don't know that I should cite these favorable figures. In order that we might get first hand information on "Collisions as the motorman sees them" I requested some of our motormen to state their views, and here are some of their replies:

When both are speeding no amount of skill can save them. Defective brakes are another cause. This applies almost wholly to the auto, for except at times of slippery rail the motorman, with the aid of a level head and plenty of dry sand, can generally stop where he likes. Inattention to duty is often the cause of collisions. The motorman or the auto driver may be looking behind him or have his mind diverted to something else. Before he knows it an accident has happened."

"The cause of a great many collisions with automobiles is the carelessness of the automobilist who will not wait a few seconds. For example, an auto and a trolley car are going north and an auto parked on the street tries to cut between another auto and the trolley car. The motorman may bring his car to a slow pace, but this cannot be done in all cases, for the trolley car sometimes is speeding so fast that the auto driver 'shoots' across the track and causes an accident. Accidents usually are due to negligence of one of the parties; therefore, one must be always on the alert and not take any unnecessary chances. Autos are often started from the curb without first giving any signal."

The auto and auto driver do create new problems for street railways and I feel the main cure is education, not only for chauffeurs but for our own employees. It is a fifty-fifty proposition. Everything in safety propaganda pays. The employers have a duty. Employees will lose interest and enthusiasm in any accident prevention movement if the management is indifferent.

All faulty equipment should be eliminated or corrected.

Managers of street railways should

co-operate to try and establish Federal regulations, more particularly as to traffic laws. The obligations and rights of the driver and the pedestrian should be definite and should be uniform in all states. Who can tell whether it is permissible in the next town to pass a street car on the left side, turn in the middle of the block or run by a standing car? Managers of street railways should co-operate with safety councils toward abolishing the parking on car lines in the business district.

I would recommend a Federal law so that all gear shifts would be uniform; that is, I would have the gear shift of the Buick car, for instance, identical with the Cadillac and all other makes of cars. I would recommend that the registrar of motor vehicles in sending out license plates and operators' licenses accompany them with pamphlets preaching the gospel of safety. I would also recommend that the executives of street railways co-operate with their local Chambers of Commerce and endeavor to induce them to organize and maintain safety councils as a part of the organization.

Specifications for Paint Pigments

SPECIFICATIONS for analysis of white, yellow, orange, red and brown paint pigments containing iron and manganese, and of dry red lead, have been approved as tentative American standards by the American Engineering Standards Committee. They were presented by the A.S.T.M., which has been designated as sponsor for these specifications. The specifications include methods of determining specific gravity, tinting strength of the color pigments and moisture, and detailed methods for various chemical determinations.

National Investigation of Coal Situation

THE Federated American Engineering Societies have appointed a committee to direct a national investigation of the storage of coal in co-operation with the United States Coal Commission, the Department of Commerce and the Bureau of Mines. W. L. Abbott, chief operating engineer Commonwealth Edison Company, Chicago, Ill., is chairman. The main committee will work through state committees, studying local conditions through local engineers in an effort to find a solution for the problems of coal consumers, from the small household to the largest industry.

The factors involved include the question of financing and providing means whereby coal in storage may be used as collateral; amounts of coal consumed

*Abstract of address at the second annual conference of the Massachusetts Safety Council, Springfield, Mass., April 25-26, 1923.

at different periods, particularly by industries; provision by industrial organizations to aid the workers of the nation in securing coal supplies during the summer at a low cost; methods of handling and storing; effect of storage on the heating value of coal; transportation facilities; allaying labor unrest, and reducing the number of mines and miners.

The first full meeting of the engineering investigating committee was scheduled to be held in Washington, D. C., on May 25, and a preliminary report on the progress of the inquiries will be submitted to the executive board of the American Engineering Council, the executive body of the Federated American Engineering Societies, at a meeting to be held in St. Paul, Minn., on June 8 and 9.

Public Utilities Advertising Association

ACCORDING to a statement by W. P. Strandborg, Portland, Ore., president of the recently formed Public Utilities Advertising Association, his organization will hold a formal get-together business meeting in connection

with the annual convention of the Associated Advertising Clubs of the World at Atlantic City, June 3 to 7. The organization is now an official member of the Associated Advertising Clubs' family, and one of the twenty-three departments in the National Advertising Commission. At the convention there will be three formal sessions, on Tuesday morning and afternoon, and Wednesday morning. At the Tuesday sessions there will be addresses of importance from the standpoint of public relations and technical advertising, while the Wednesday morning session will be devoted to the business affairs of the association.

Among the speakers who have already agreed to address the meeting are P. H. Gadsden, vice-president United Gas Improvement Company, Philadelphia, Pa.; Francis H. Sisson, vice-president Guaranty Trust Company, New York, N. Y.; W. H. Boyce, general manager Beaver Valley Traction Company, New Brighton, Pa., and Grover T. Maxwell, former secretary Ohio Public Service Commission. There will also be talks by a number of members of the association, giving the results of their experiences in publicity work.

number of stops the greater the saving that will be shown.

The second day of the convention was given over largely to a discussion of the relations between the public utilities and the general public, and all the speakers stressed the importance of maintaining close and friendly relations with the public. W. B. Tuttle of the Public Service Company of San Antonio was chairman of the session, and introduced H. B. Abell of New York, chairman of the committee on public utility information of the National Electric Light Association. Mr. Abell pointed out the necessity for concerted efforts on the part of all utility companies to keep in close contact with the public and the advantages of adjusting all differences promptly and satisfactorily.

"The public and the newspapers," he said, "should be curious for the facts, but should not be suspicious. Their greatest interest is in good service and a fair price."

He referred to the cries of men whom he styled as "demagogues," who, he said, are continually crying that utilities abrogate their contracts and he asserted that public utilities are in a vulnerable position for adverse attacks by such men. He attacked unregulated competition and suggested education as its cure.

George H. Clifford, vice-president and general manager of the Northern Texas Traction Company of Fort Worth, spoke on the subject: "Telling the Utility Story Through Utility Employees." He asserted that one member out of every twenty families in Texas is employed by a public utility, and pointed out that this fact affords great possibilities for spreading the message of the utilities among the people. He said that if utilities will take advantage of this fact the problem will be an easy one. He suggested that vocational education of employees will greatly increase the value of employees for improving public relations and will give them a better insight into their problems.

E. D. Shurter of the University of Texas and head of the American Citizenship League of Dallas declared that speakers in the schools of Texas offer an excellent avenue to spread information on the operation of public utilities and to improve public relations.

Earl H. Hodges, director of the Arkansas Public Service Information Bureau of Little Rock, in an address said that one man on a Little Rock car line makes it an absolute rule to say "good morning" to every person getting on the street car. Mr. Hodges said he found it a little boresome himself, but it is a big hit with the general public. To the average man this conductor is the company and the company is judged by him. It is important to impress people with the fact that utilities have the interest of the state at heart and desire to assist in developing it. It is important to carry out the idea that the company is interested in development as well as in dividends.

Annual Convention of Southwestern Association

THE Southwestern Public Service Association and the South Central Gas Association closed their three-day annual conventions, held jointly, in Fort Worth, Tex., on Thursday, May 17. Joe H. Gill, general manager Dallas Power & Light Company, was elected president of the Southwestern Public Service Association, which hereafter will include the South Central Gas Association, the latter having been merged in the larger organization. Other officers elected are C. B. McKinney, Dallas, first vice-president; H. E. Bolton, Calvert, second vice-president; George I. Plummer, Dallas Railway, third vice-president; F. J. Gannon, Fort Worth, treasurer. The selection of the convention city for next year as well as the election of a secretary was left to the executive committee.

New members of the executive committee are: G. W. Fry, Abilene; F. M. Hoag, Dallas; E. T. Keck, Dallas; C. M. Armbruster, Shreveport; H. B. Flowers, New Orleans.

Resolutions of regret at the death, during the year, of Judge M. B. Templeton of Dallas, one of the founders and at the time of his death a member of the general counsel for the Texas Electric Railway, and of Charles Dillon, of the Shreveport Traction Company, were adopted at the closing session.

More than 200 executives and other officials of utility companies in the Southwest were present when the convention was called to order Tuesday morning by R. J. Irvine of Jacksonville, Tex., president of the association. The president in his annual address at-

tacked the use of improved highways by motor trucks in the transportation of freight and passengers as wasteful competition with the electric and steam railways.

Mr. Irvine stated forcefully that the hard surface highways were being destroyed by heavy hauling, and that millions of dollars of the money paid in taxes by the public generally was going to enrich the few motor truck operators who paid little or no taxes. The principle of taxation for highway construction and upkeep is wrong, he said, declaring that those who use the highways most should be made to pay most for them.

"Where our highways parallel steam railways and interurban lines, and are used to carry freight and passengers for hire, the detrimental effect is to reduce revenues of those companies which pay a very large portion of the original cost of highway construction and also most of the cost of maintenance. Such abuse of our highways renders them unsafe and unfit for the purpose intended," Mr. Irvine declared.

In discussing dealings with the public, Mr. Irvine declared that he is inclined to assume the attitude that the public is always right and charged those attending the convention to be attentive to small grievances and seek to establish a thorough friendship for their company.

The speaker also dealt with the use of electric motor trucks in handling of house to house deliveries and asserted that electric trucks will show a great saving over gasoline-driven trucks for such service and that the greater the

Standardization and the Purchasing Agent

AT THE meeting of the National Association of Purchasing Agents, held in Cleveland during the middle week of May, a paper on the effect of standardization on the work of the purchasing agent was read by Dr. P. G. Agnew, secretary, American Engineering Standards Committee. He claimed that hundreds of millions of dollars could be saved annually by municipal and state governments and by the industries of this country through the unification and standardization of purchase specifications. He pointed out that industrial

standardization means to single out specific products and materials, to settle upon their properties and dimensions, and to concentrate upon them in production and in use, all to the end of bringing about the greatest over-all industrial efficiency possible.

This standardization involves (1) nomenclature; (2) purchase specifications; (3) methods of tests; (4) uniformity in dimensions necessary to secure interchangeability of supplies and the interworking of apparatus and of parts; (5) provisions for safety; (6) concentration upon the best number of types, sizes and grades of manufactured products.

their final reports, the extensiveness of which showed that much work had been accomplished during the past year. The sub-committee on gearing presented a tabulation of answers received through a questionnaire, together with further recommendations for submitting data regarding the standardization of web holes in gears.

The sub-committee on trolley contact devices also is tabulating data received from a questionnaire. These will be added to the data collected during previous years.

A third sub-committee reported activity in reviewing existing standards. All the standards and specifications relating to equipment have been gone over very thoroughly and recommendations were made for bringing these up to date so as to correspond with specifications of the American Society for Testing Materials and of the American Railway Association. The sections relating to miscellaneous methods and practices involving equipment had been studied carefully and submitted to manufacturers for criticism. As these appear to be out of place in the permanent form of manual now contemplated the equipment committee's recommendation to the committee on revision of the manual is that they be omitted from the bound volume.

The study of spring supports for railway motors which has been under consideration by a fourth sub-committee has proved interesting. Much information has been collected and several recommendations for general use will be submitted, which should aid materially in overcoming difficulties experienced from various motor supports.

Recommendations for standard designs of dust guards were submitted by another sub-committee. These are in shape for final report.

This was the final meeting of the equipment committee before the convention.

Significant Conference on Education

AT THE invitation of Chairman Edward Dana of the American Association committee on education, several representatives of member companies met with the committee in New York City on May 11. The purposes of the meeting were to block out the report of the committee preparatory to its completion by a sub-committee, and to secure toward this end the experience of companies which have been active in educational work.

The morning session of the committee was occupied with accounts of recent actual experiences. F. J. Gannon, Fort Worth, Tex., told of the foremanship class held in that city last year under the State Board of Vocational Education. Shop courses are also conducted. Instructors are sent to Austin for training. Similar classes are held in Houston, Dallas and El Paso.

J. F. Hyatt, Highwood, Ill., described the work which has been done on the Chicago, North Shore & Milwaukee property. This company got into its

American Association News

Executive Committee

THE executive committee of the American Electric Railway Association met in New York on May 25. The attendance was comparatively small. Those present were President C. D. Emmons, W. H. Sawyer, C. E. Morgan, J. H. Hanna, J. N. Shanahan, L. S. Storrs, R. P. Stevens, J. H. Pardee, C. L. Henry, C. R. Ellicott, E. P. Waller, A. A. Hale, Barron G. Collier; Mr. Haskell, representing S. W. Curwen and Executive Secretary J. W. Welsh.

Mr. Sawyer, reporting for the membership committee, pointed out that there are a large number of companies which are receiving the benefits of the Association through the membership of an affiliated company, without paying any dues. This resulted in a good deal of discussion as to whether this situation should be permitted to continue and how best to correct it. On motion the membership committee was directed to study this problem and recommend some definite basis of treating the question of dues of affiliated companies, possibly looking toward an amendment of the constitution if necessary.

President Emmons suggested the personnel for the committee on nominations and the executive committee gave its approval. J. H. Pardee will serve as chairman of this committee. The other members will be announced later.

The committee discussed the advisability of indorsing the work of the National Transportation Institute. As further information was desired as to the purposes, the cost to members, and whether it meant duplication of effort, action was deferred until the next meeting of the executive committee. Meantime President Emmons and Mr. Storrs will investigate and report.

Application for membership in the association was approved for the following railway and manufacturer companies: Alabama Power Company, Birmingham, Ala.; Cumberland Traction Company, Bridgeton, N. J.; Chicago & West Towns Railway Company, Oak Park, Ill.; T. H. Symington Company, New York; Yellow Coach Manufacturing Company, Chicago.

The next meeting of the committee will be held at New York on Friday July 13.

Entertainment Committee Appointed

PRESIDENT C. D. EMMONS has appointed the following men to serve on the entertainment committee for the annual convention of the American Electric Railway Association in October:

J. C. McQuiston, manager department of publicity, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., chairman; L. H. Palmer, general manager United Railways & Electric Company, Baltimore, vice-chairman; J. H. Hanna, Washington; C. H. Beck, New York; E. F. Wickwire, Mansfield, Ohio; F. D. Burpee, Ottawa, Canada; Martin Schreiber, Camden, N. J.; George R. Lyman, New York; J. P. Barnes, Louisville; J. V. Sullivan, Chicago; William Arthur, New Haven, Conn.; E. C. Faber, Chicago; K. A. Simmon, East Pittsburgh; C. C. Pierce, Boston; Harry L. Brown, New York; H. Fort Flowers, Findlay, Ohio; J. S. Bleecker, Springfield, Ohio; E. P. Waller, Schenectady, and Harold Hegeman, New York.

Equipment Committee Puts Finishing Touches on Year's Work

A MEETING of the committee on equipment of the American Association was held in New York City on May 17 and 18. Those present were F. H. Miller, Louisville, Ky., chairman; Walter S. Adams, Philadelphia, Pa.; L. J. Davis, Brooklyn, N. Y.; Charles Gordon, Chicago, Ill.; J. L. Gould, Wilmington, Del.; A. J. Miller, Ramapo, N. Y.; M. O'Brien, St. Louis, Mo.; E. D. Priest, Schenectady, N. Y.; E. S. Sawtelle, Cincinnati, Ohio; P. V. C. See, Akron, Ohio, and C. W. Squier, New York, N. Y. C. Bethel and W. H. Phillips, Pittsburgh, Pa., represented J. M. Hipple.

The several sub-committees submitted

educational activities during the war through its Americanization program for track men. It has now developed until one man is employed to give his whole time to the work and an extensive program is in operation. An interesting feature is that there are now four classes in public speaking at the expense of the men. H. O. Allison, New Brighton, Pa., said that the Beaver Valley Traction Company has two schools in operation. In one a course of thirty-six lessons dealing with everyday subjects is given, and in the other home problems are dealt with.

N. E. Stubbs, Baltimore, Md., stated that the United Railways & Electric Company co-operates with the Johns Hopkins University and other institutions in providing instructions for employees, of whom 250 are doing some school work. The company pays one-half of the fees on completion of the courses. A business course at J.H.U. costs \$20 and a technical course \$40.

These notes will serve to indicate the general tenor of the discussion, which was participated in by all of the committee members and visitors present. Besides those mentioned, there were in attendance the following: George A. Barnes, New York City; C. R. Ellicott, New York City; H. H. Norris, New York City; M. B. Lambert, Pittsburgh, Pa.; C. E. Morgan, Brooklyn, N. Y.; James McFall, Connellsville, Pa.; C. F. Schmidt, Indianapolis, Ind.; C. P. Rexford, New Bedford, Mass.; A. M. Robinson, Philadelphia, Pa., and W. H. Timbie, Boston, Mass.

Specifications for Air Reservoirs

A MEETING of the Engineering Association committee on specifications for non-fired pressure vessels was held in New York City on May 17 with a 100 per cent attendance of the committee, namely, R. H. Dagleish, Washington, D. C., chairman; L. J. Davis, Brooklyn; and J. A. Leefler, Pittsburgh, Pa.

A preliminary specification was discussed by the committee. This had been previously sent to a number of the equipment men for consideration and, as the committee on equipment was in session while the pressure-vessel committee was holding its meeting, the specification was submitted to the equipment committee. It was decided that after recommended changes had been made, the specification will again be submitted to the equipment committee.

It was stated that while the boiler code committee of the A.S.M.E. has not yet completed its investigation in this field, it is understood that the committee will consider acceptable those tanks in which the longitudinal seam has been welded. This decision is consequent upon an extensive test of seam-welded tanks made by the United States Bureau of Standards in February. The Engineering Association committee was of the opinion that it should recommend tanks with longitudinal seams either welded or riveted.

The question of enameling the interior of the tank was discussed, and it was decided that the specification should cover both enameling and galvanizing.

Power Distribution

A TWO-DAY meeting of the power distribution committee of the Engineering Association was held in New York, May 21 and 22. Members present were M. B. Rosevear, chairman; J. W. Allen, L. W. Birch, H. G. Burd, R. W. Eaton, C. L. Hancock, C. R. Harte, sponsor, H. D. Hawks, C. J. Hixson, A. Hughes, Jr., C. H. Jones, H. S. Murphy, W. Schaake and F. J. White.

Mr. Hughes, chairman of the sub-committee on revision of the power distribution sections of the engineering manual, reported that it is desirable to get incorporated in the revision of the manual any changes that are to be made. Certain of the sections can be included as they stand.

The section covering specifications for sherardizing or galvanizing line material has been referred to the A.E.S.C., which plans a conference of manufacturers to determine if an American standard for galvanizing and sherardizing should be formulated. Mr. Hixson said that there is a great difference of opinion among the manufacturers and users as to the methods of protection in general, and that some standardization should be made on this point also. Several other specifications are now referred to the A.E.S.C. for action leading to adoption of American standards.

The section on clearances for overhead working conductors has been referred to the heavy electric traction committee.

The 600-volt overhead trolley construction section of the manual has been submitted to the A.E.S.C. This is a construction specification only and does not include materials, which are covered in other specifications. Some changes were recommended. There was some discussion on the subject of ground sleeves for tubular steel poles. In cases where they are used it was felt that they should be beveled at the top joint to assist drainage. Also, the poles should be set so that the sleeves will extend at least 12 in. above the ground.

It was the sense of the meeting that the sections on signaling, which cover signal aspects, can be combined and simplified to some extent, and that the section on car registering signals can be simplified materially, and also modified to conform to standard practice.

The sub-committee on catenary construction, Mr. Jones, chairman, reported on a specification which includes the location of trolley wire on curves.

Mr. Murphy, chairman of the sub-committee on trolley wire wear and specifications, read the preliminary draft of a report covering a study of the composition and relative wear of trolley wire which has been made,

looking toward a joint specification for hard-drawn trolley wire. This sub-committee reports that it has virtually reached an agreement with the similar sub-committee of the A.S.T.M., thus making the trolley wire specifications of the two associations uniform. The sub-committee hopes that this action will be ratified by both associations at their next annual meetings. In this connection it was decided to recommend to the executive committee that a research be conducted to determine the extent to which various factors influence the wear of trolley wire. It was felt that the problem is intimately connected both with the design of the overhead and of the collecting device, and that any study to be made should include these factors.

It was also decided to request that a test be made of trolley wire wear in connection with the test of rail joints now being arranged for.

It was the sense of the meeting to recommend that work on signals, which has been under this committee for several years, be placed under an independent standing committee at the next convention. This will permit of more attention being paid to the work of other associations dealing with signaling.

Suggestions were made that, in addition to the subjects already before the committee, concrete poles and rail-joint bonding be added for next year's program.

Committee activities of the A.E.S.C. regarding wire and cable specifications were reported on by Mr. White, who is secretary of the sectional committee. He gave a brief progress report on the work of the twelve technical committees handling this work in the A.E.S.C.

Mr. Harte reported on the status of the sections of the manual relative to wood and other poles.

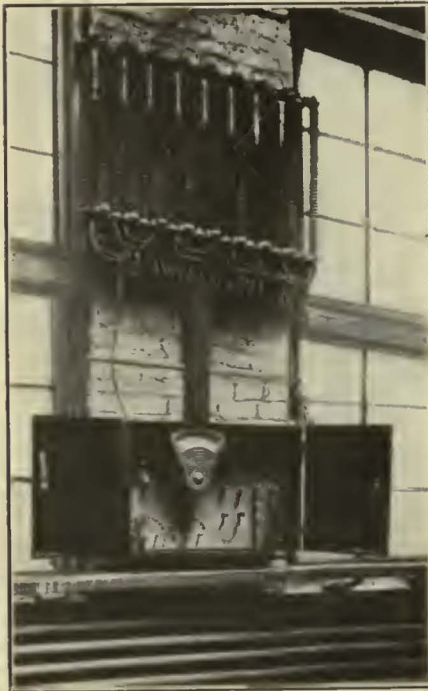
Accident Prevention

The committee on accident prevention of the Transportation & Traffic Association held a meeting in New York on May 18-19. Those present were: H. B. Potter, chairman; M. W. Bridges, A. W. Koehler, E. M. Walker and H. Restofski of the T. & T. committee, together with H. O. Allison, chairman of the corresponding committee for the Claims Association. The meeting was taken up principally with a discussion of the returns from a questionnaire sent out to member companies. Replies have been received from 110 companies in the United States and Canada, representing thirty-eight states. The tabulated returns give a comparison of reasons for accidents. These have been well analyzed, and form a basis for a better organization of work in accident prevention. The returns also indicate that despite increasing street traffic, the situation regarding accidents is more encouraging than it has been in the past. The data collected will form a part of the final report to be presented at the October convention.

Maintenance of Equipment

Testing M-U Control Under Service Voltage Conditions

FAILURES in the control mechanism on cars equipped with multiple-unit control, such as the turret type or the switch group type, are often caused by the decrease in line voltage as the train approaches a feeder end. The control may "notch up" in a satisfactory manner under inspection, as the line voltage may be high in the shop due to its



Apparatus for Producing Various Line Voltages

location near the source of power. However, at terminals, which are often single-end fed, the voltage may drop off as much as 40 per cent. The operating mechanism, such as the pistons and valves of an electro-pneumatic control apparatus, will not function properly under these low-voltage conditions, and such inoperation may cause considerable delay.

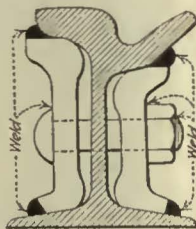
A testing outfit to reproduce various line voltages has been installed in the shops of the Northwestern Elevated Railroad, Chicago. The apparatus was built in the company shops and consists of suitable resistance coils mounted on the wall, and a switch cabinet with slate panel on

which is mounted a direct-reading voltmeter and knife switches, switch levers and contact points, and suitable fuses. The line current is carried through the apparatus and delivered to the collector, either shoe or trolley pole, at any voltage the control man may desire. The voltmeter gives him directly the voltage condition under which he is testing the control mechanism. Adjustment of the mechanism is then made so that it will function properly under voltage conditions worse than those experienced on the road.

Since the installation of this apparatus no failures from faulty control mechanism have occurred on the cars served by this particular shop.

Large Seam Section for Welded Joints

THE joint plates used by the Lehigh Valley Transit Company for repairs to 96-lb. and 116-lb. grooved girder rail are cast in its own steel foundry. In order to give an ample cross-section for the weld along the seam a plate similar to that used by the Third Avenue Railway System, New York City, is used. This was described in the issue of the *ELECTRIC RAILWAY JOURNAL* for Nov. 18, 1922, page 808.



Cross-Section of Rail Joint Showing Provision for Insuring Large Section of Welding Metal



Completed Welded Joints as Installed by Lehigh Valley Transit Company

The outside portion of the joint plates projects outside the railhead so as to provide a V-shaped groove for the welding metal. The bottom

of the plate is shaped so as to permit the laying of the seam weld back at the edge of the rail base. The bolts used to hold the plates in position during the welding are welded around the heads, and the nuts are welded at the contact surface and also at the thread.

Circuit Breakers Tested Under Low Voltage

CAR circuit breakers are calibrated and tested according to the number of amperes at which they will open. Hence, they can be tested just as easily with low voltage as with high. Nevertheless, the trolley



Circuit Breakers Are Tested with Storage Battery Current by This Board

voltage is usually employed, because that is available and a lower voltage is not.

The Cleveland Railway, which has been a pioneer in many directions, conceived the idea, or at least Terence Scullin, master mechanic of the company, did, of testing circuit breakers with 6 volts, and that is the voltage used at the Harvard Avenue shops of the company. The accompanying line drawing and half-tone show the construction of the circuit-breaker testing outfit.

The current used for testing is obtained from a 6-volt storage battery, type MVS-21, made by the Electric Storage Battery Company. Other parts of the testing equipment con-

sist of a circuit breaker set at the maximum limit of 500 amp., suitable resistance grids, a four-point control switch, a 500-amp. meter and a single-blade knife switch.

This low-voltage testing outfit has several advantages besides the one that very little power is used by it. The principal one is that as there is no danger of shock or flash, the test is easy to carry out, and it is done

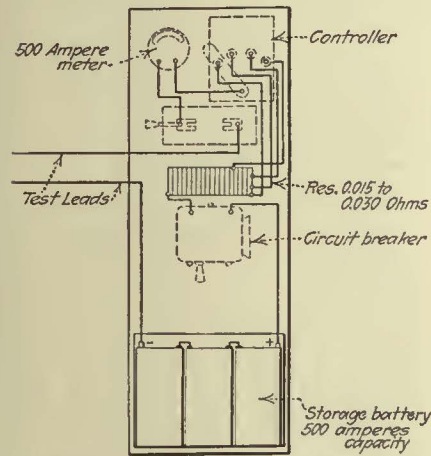


Diagram of 6-Volt Circuit-Breaker Testing Board

at Cleveland at the repair bench. Then if any defects, such as short-circuited magnet coils, poor contacts, excessive friction or other trouble are discovered, they can be corrected before the breakers leave the repair bench.

It has been found necessary to recharge the batteries only about every three weeks.

After being tested at the repair bench in this way, car circuit breakers are also tested under 500 volts on the car. This is done in the car yard on a special section of trolley wire which is fed through a circuit breaker calibrated to about 350 amp. The motors on the car are cut out and the current is put through resistances on the car.

Interlocking Door Operation with Control

TO PROVIDE for interlocking the operation of the doors with that of the control equipment, so that cars cannot be started until all doors are closed, the Lehigh Valley Transit Company, Allentown, Pa., makes use of the following attachments.

On the company's center entrance type of car there are four doors with operating shafts. Fiber drums with necessary copper contacts are installed at the bottom of these door-

operating shafts, and a finger block with two fingers makes the necessary contact for the opening and closing circuits. With the doors closed, the circuit is connected in series with the line switch operating wire, so that the advancing of the controller handle will then energize the coil of the line switch and bring this in.

In regular operation the controller handle can be placed on its first operating notch, and the closing of the doors will then close the circuit to the line switch, so that this will be brought in as soon as the doors are closed.

Reducing Armature Failures Over 50 per Cent

BY JOHN S. DEAN
Westinghouse Electric & Manufacturing Company

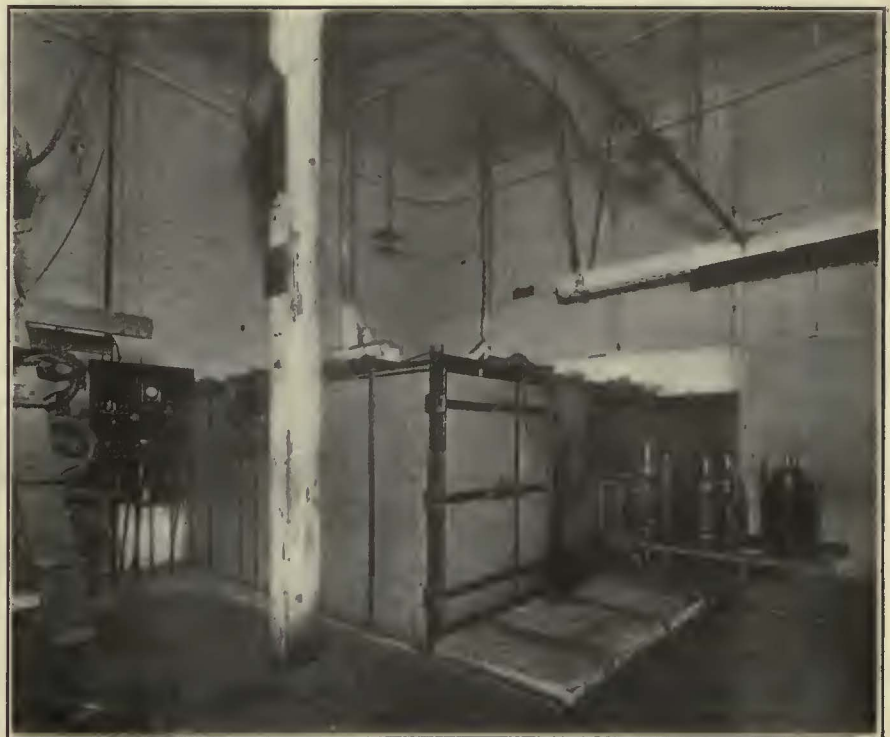
AN EXAMPLE of what can be accomplished by dipping and baking railway motor armatures is furnished by the experience of one city railway property located in a section of the United States where the average monthly precipitation of rain and snow is approximately 4 in. This railway operates 1,800 railway motors, of which 70 per cent are of the non-commutating-pole type and have been in service for many years. Due to the age of the equipment, an increasing number of yearly armature failures here would naturally be expected. However, this company

has noticeably reduced its motor failures since 1919, when it began to dip and bake the armatures. The record is shown by the following tabulation:

| Year | Average Armature Failures per Month | Per Cent Reduction in Failures. |
|------|-------------------------------------|---------------------------------|
| 1919 | 67 | .. |
| 1920 | 38 | 44 |
| 1921 | 26 | 61 |
| 1922 | 24 | 64 |

In this work a Westinghouse type R3 electrically heated oven is used. It is fitted with thirty type C heaters with a total power consumption of 69 kw. at 550 volts. With the present facilities approximately fifty armatures can be treated per week. The whole operation of dipping armatures, loading and unloading the trucks and taking care of the oven is handled by one man. It is estimated that about 1½ gal. of varnish is used for each armature. The approximate cost to remove an armature from the car and to replace it with another, and to dip and bake it, including labor, material and power to heat the oven, is between \$6 and \$7.

The master mechanic on this property feels that this expense is justified, and he estimates it will prolong the life of his armatures approximately five years. One noticeable fact in this connection is that the pile of bad-order armatures on the armature room floor has been reduced from an average of fifty to ten or less, and the pull-ins from service due to armature troubles have also decreased very noticeably.



One Man Cares for Dipping and Baking With This Oven

Sectionalizing Overhead Special Work

By G. H. MCKELWAY

Distribution Engineer Brooklyn Rapid Transit Company

MANY railways are opposed to cutting section insulators into the trolley wire on curves. Conditions frequently occur, however, at intersections where it is desirable to connect the lines physically by connecting curves and still keep them apart electrically. Section insulators must then be cut into the wire on the curve, or they must be cut in on one of the lines extending either side of the intersection but far enough away to be outside the frogs, so that the special work, including the through wires on both lines, can be fed from a single feeder. With this construction, if the feeder is killed for any reason, the whole of the special work is dead and cars on both lines are tied up unless it is possible to coast across the dead section on the line whose feeder is alive. This may be possible in some instances, but generally the first intimation that a motorman has that the intersection is dead is when his car runs onto it and becomes stalled. Even if the crossing is unobstructed it is often dangerous to coast across a busy intersection at high speed unless there is a traffic officer present, or some one who can control passing vehicles while the car is moving across the dead portion.

The intersection can be kept alive by installing a double-throw switch to connect either of the two feeders to the trolley on the intersection, and also installing section insulators in the two trolley wires on all sides of the intersection. This arrangement makes a separate section of the intersection and allows the special work to be fed from the feeder of either of the two lines. While such an arrangement is entirely practical, it is not often installed because it is rather expensive and the maintenance of two section insulators in each wire is also troublesome. Its best use is at points of heavy traffic.

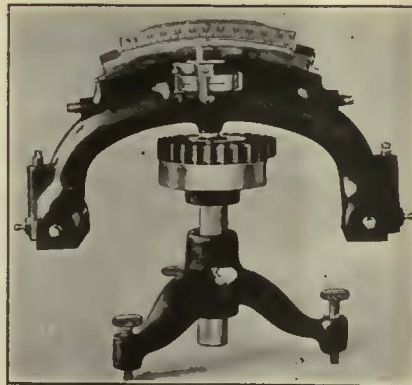
In most cases, however, the simple cutting of an insulator into the trolley wire of the curve will be found to be entirely satisfactory and will be much cheaper. Where most of the traffic is straight through the special work, there is seldom any excuse for installing either of the other schemes, as the insulator in the curve will give no trouble. Of course, trolley wheels will follow a smooth trol-

ley wire, in which there are no breaks, more easily than any combination of the wire and something else, but the number of wheels that will leave at the section insulator will be negligible if the insulator is properly installed and maintained.



Novel Device for Testing Hardness

EDWARD G. HERBERT, Ltd., Manchester, England, has just placed on the market the Herbert pendulum hardness tester. The instrument is shown in the accompanying illustration placed so as to test the hardness of a milling cutter which is mounted on a tripod stand. It consists of a pendulum, of the peculiar form shown, which rocks on a ball of steel or ruby 1 mm. in diameter, held in a chuck in the center. Six screwed weights are pro-



A Hardness Tester in Which the Measurement Is Made by the Time or Amplitude of Oscillation of a Pendulum

vided whereby the position of the center of gravity of the whole instrument may be adjusted to coincide with the center of the ball or otherwise. The center of gravity being at the center of the ball, the instrument is in neutral equilibrium when supported by the ball on a hard level surface; that is, it tends to remain in any position in which it may be placed. For standard tests the center of gravity of the instrument is lowered until it is 0.1 mm. below the center of the ball, when the time of a single swing on a very hard surface is ten seconds. The swing of the pendulum is indicated by means of a bubble in a curved glass tube, attached centrally to the top of the instrument, and a curved scale

mounted over the tube and graduated from 0 to 100.

This instrument provides two means for testing the hardness of a material: (1) By the arc through which the pendulum swings when it is released from a position in which the bubble stands at zero. On glass, this, as indicated by the bubble scale, is 97; on tempered high-speed steel it is 75, and on annealed carbon steel it is 41. (2) By the time of a single swing of the pendulum. On a very hard surface this is ten seconds; on hard steel it is from five to eight and one-half seconds, and on soft steels from two to four seconds. The time test is recommended.

The fundamental principles involved in these two hardness tests are these: (1) When the pendulum is deflected to the end of the swing and released, the ball rolls out or elongates the slight indentation made in the surface of the material under test. The energy absorbed in thus displacing the metal is taken from the potential energy of the pendulum as is shown by a shortening of its first swing. This gives the basis for what are known as the "scale" tests. (2) The time of oscillation is related to the hardness of the material because when the ball indents the surface the length of the pendulum is shortened and the time is correspondingly shortened in accordance with the law of the compound pendulum; that is, the time is inversely proportional to the square root of the length of pendulum. Obviously, as the full length of the pendulum in this case is only 0.1 mm., a slight indentation serves to affect the length considerably.

An empirical relationship between the time-test scale and the Brinell hardness scale has been established experimentally

Triplex Ammeter for 3-Phase Circuits

THE Roller-Smith Company, New York, N. Y., has brought out a new type of ammeter which permits the simultaneous reading of the current in the three phases of a three-phase circuit. The ammeter mechanisms are independent, but are all mounted in one case 7½ in. in diameter. Each mechanism has a capacity of 5 amp. and its scale is marked according to the ratio of the current transformer to which it is connected. The mechanisms are of the electromagnet type, with an air-damping scheme.

The News of the Industry

Improvement Program Planned

Georgia Railway Files Petition Promising Railway Betterments, Organization of Bus Service and Increased Ticket Sales

WITH the idea in mind of furnishing Atlanta with better, safe, quicker and more extensive electric railway service the Georgia Railway & Power Company on May 11 filed a petition with the Mayor for presentation to the City Council outlining a constructive plan for the solution of the city's present traffic problems and its future transportation needs. The company makes a strong plea for the co-operation of the city and the public in helping it to attain its ambitions—to provide transportation service to 500,000 people—a goal toward which all residents of Atlanta are working.

The program submitted for enlarging the service includes improvements to the electric railway system, organization of a bus system to supplement the street railroad and increased sale and use of tickets.

The improvements to the railway system embrace general improvement in track, cars and the electric system, the speeding up of cars and a general improvement in service as a basis for increased travel. The company states in its petition that before launching the proposed program of increased service it succeeded in providing more than \$1,300,000 for general improvements during 1923, but could not succeed in securing any money for extensions. This work is now going on.

Because of the fact that it will be many years before the company can extend its service by building tracks in developing areas the plan seems feasible to provide motor bus transportation. It, therefore, is the intention of the company to provide a responsible, dependable service backed by ample capital and thoroughly regulated. A coordinated system is what is proposed which will bring bus transportation under the existing laws regulating electric railway service as to schedules, fares and routes. This, in the opinion of the company, is the only way that the public can get any benefit from such service.

Instead of selling fifteen tickets for \$1 the plan is to sell three tickets for 20 cents, or multiples thereof. The idea back of this plan is to increase the sale of tickets, thereby eliminating some of the delays caused by the fact that at present most of the car riders pay cash fare and the loading of cars is delayed in making change. Increased use of tickets will speed up the cars.

The company states that there are

many conditions which definitely limit the company's ability to carry on and develop the public transportation service. These present handicaps include private and public automobiles, unregulated jitney competition, unnecessary congestion of the streets, lack of enforcement of traffic regulations and the greatly increased cost of both materials and labor.

The existence of these conditions means that the service being furnished is unprofitable. The company contended that the operating ratio has risen from a fraction more than 50 per cent in 1909 to more than 72 per cent in 1922. Under these circumstances the company claims it is impossible to make extensions no matter how much the communities need transportation. It is in order to correct these conditions that the company has prepared the constructive program just described.

In carrying out its proposed program the co-operation of the city is asked in the following two particulars:

1. Regulation of jitneys by vigorous enforcement of existing laws and the passage and enforcement of all regulations necessary to prevent unfair competition.

2. Traffic regulation.

With respect to the regulation of jitneys, the company in its petition states that it is unfair to permit jitneys, unregulated and untaxed, to compete with the public service company; that it is the duty of a community to protect its transportation agency when it has invited the investment of vast sums of money in providing that service. Further, that the city actually loses money through the operation of every jitney on the streets of Atlanta. The jitneys contribute nothing to the construction and upkeep of the streets, while the city gets \$983 every year from every street car operated. It is further charged that the jitney contributes to a considerable extent to the congestion on the streets.

On the subject of traffic regulation, the petition states that 250,000 passengers who use the electric railway cars daily are being subjected to ever-increasing delays owing to the fact that proper regulation of traffic is not enforced. It recommends the adoption of all necessary additional laws to relieve this congestion on the downtown streets. Further, that the individual must be convinced that it is to his personal interest to observe strictly the traffic

ordinances because they save his time whether he uses an automobile, a truck or a street car.

Municipal Ownership Advocate Elected in Denver

Ben F. Stapleton, former postmaster of Denver and candidate of Governor William E. Sweet of Colorado, was elected Mayor of Denver on May 15 in one of the most bitterly contested elections ever held in Colorado. Governor Sweet openly announced that he would not back a candidate who did not favor municipal ownership of utilities.

Of the seven candidates in the race, all but two, Mr. Stapleton and D. C. Bailey, who was defeated for re-election, expressed themselves unequivocally on this point. The other candidates, however, harped on the issue as a subject of widespread interest.

Decision as to possible municipal ownership will probably be made during the term of the recently elected Mayor and this accounts for the subject being injected into the spring campaign. Mr. Bailey openly opposed the idea of municipal ownership.

Mayor-elect Stapleton's platform on the subject of public utilities as advertised prior to the election provided:

The Mayor should make known to the public the facts as to the value and cost of operations of the tramway and gas and electric properties. Our home rule charter requires the submission of all questions of ownership and franchise to the people for final decision. The duty of the city administration is to carry into effect intelligently the mandates thus expressed.

The agitation for municipal ownership which has now resulted in the election of Mr. Stapleton to office is generally credited as being largely the result of the aftermath of bitterness and misunderstanding growing out of the Denver Tramway strike of 1920.

Ten Per Cent Wage Increase in Toledo

In a new wage contract which became effective on May 22 the platform men of the Community Traction Company, Toledo, will receive a wage increase of approximately 10 per cent. The entire boost will raise the operating expense of the company, about \$13,000 a month.

From a scale of 45 cents for the first three months, 47 cents for the ensuing nine months, and 50 cents an hour thereafter the scale has been boosted to 50, 52 and 55 cents for the same periods of service. The scale was agreed upon after a four-day conference participated in by representatives of the company and the men. The men had asked rates of 60 and 65 cents. Shop men received a corresponding wage increase.

Increase of Five Cents

Arbitration Board on Wages of Cleveland Railway Employees Finds Sixty Cents Maximum

As was announced in the *ELECTRIC RAILWAY JOURNAL* of May 5, wages of motormen and conductors of the Cleveland Railway were increased 5 cents an hour beginning May 1. The decision, which was the result of arbitration, fixes the scale at 55 cents for the first three months, 58 for the next nine months and 60 cents at the end of the first year. The men had sought an advance amounting to 15 cents an hour.

In fixing the wage award the board of arbitration took into consideration two methods, one of which was termed relative based on the history of increases in the cost of living, of wages, etc., and the other absolute, based on present and future conditions and actual costs of living.

EMPLOYEES MADE A FAVORABLE IMPRESSION ON BOARD

It was brought out that 2,750 trainmen were employed by the company, of whom 2,060 were regulars and 690 extra men. The board characterized the men in general as clean cut, efficient, courteous and careful in their personal habits. Further, that the men worked under favorable surroundings while on the road. But there were hardships to take into consideration, namely, the irregular and unusual hours and the working on Sundays and holidays.

The board prepared a table compiled almost exclusively by using the figures quoted in Arthur Sturges' exhibits submitted in behalf of the union beginning with May 1, 1918, and ending with May 1, 1924. In determining the wage scales set forth therein studies were used that were made from time to time by the United States Bureau of Labor Statistics and founded on 1918 actual expenses of actual families. These were submitted as the only authoritative data on the cost of living in Cleveland. To the table the board added an estimated index for March, 1923, of 173.4, assuming thereby that the cost of living had increased three points since December. It was remarked that since this estimate was made the financial editor of the *Iron Trade Review* was quoted as saying that the cost of living was 59 per cent only above 1914 according to the index of the National Industrial Conference Board.

Summing up the tables, the results were that, if based only on relative increased cost of living, the maximum decision of the board for the ensuing year should be 52 cents; that if it is assumed that the wages were lower than necessary to the extent of 10 per cent, which is really when analyzed, the position that the men took in 1918 and in 1919, the wage scale for the next year should be 57.1 cents. But the board went further and calculated that if it were to adopt the wage scale which most closely approximated the history of the past, namely, the one that assumed an addi-

tion of 15 per cent to the bare cost of living, the rate would be 59.8 cents. The last rate to be considered, assuming a 19.1 per cent increase over and above the cost of living, is 61.9 cents.

The board also took into consideration the fact that in 1919, considered as the boom year, the men secured their maximum demands, namely, 60 cents, and in that year the cost of living was considerably higher than it was now, according to everybody's testimony. The board said that the maximum wage in 1923 should be 60.5 cents. This figure was arrived at by consulting the trend from month to month of the average pay-roll earnings of nearly 2,000,000 employees in forty-three industries, according to the Bureau of Labor Statistics and taking into consideration the average of May and June, 1920, as the standard.

In making its decision the board considered the various standards which were submitted by way of budgets. Among them was that of \$1,661 submitted by Arthur Sturges, which was a compilation of the expenses of 245 families in Cleveland by the Bureau of Labor Statistics, 180 of which families saved money on that income and sixty-two had a deficit. It was also brought out that a considerable percentage of the railroad men, especially of the extras who were working for \$3.30 a day, must be unmarried. The board reconciled these budgets with a proposed budget for a single man, and taking the figures submitted to the effect that the average day's work was eight and one-half hours and assuming 313 working days, a maximum rate was arrived at somewhat less than 60 cents.

The board in conclusion recommended the improvement of working conditions, especially the abolition of the runs whose spread was more than eighteen hours.

MEN'S REPRESENTATIVE DECLARES AWARD UNFAIR

The award was approved by Judge Fielder Sanders, former City Street Railway Commission, and Thomas P. Schmidt, representing the company. Judge Frederick Walther, representing the men, dissented from the award of 55, 58 and 60 cents on the ground that he could not agree that that rate constituted a fair living wage. He said that in his opinion the American standard of living required that not only should a man be entitled to a decent living wage, but that he should be permitted to earn such wages without being compelled to work seven days each week, and that every man is entitled to have at least one out of seven free from being compelled to work at his usual labor. Further, his own budget of \$1,763 for a family consisting of husband, wife and three children would not provide for savings, old age or any luxuries.

He further argued in his statement that it was the very great exception when any trainman actually puts in his eight and one-half hours in straight time. It was his contention that the

testimony before the board of arbitrators showed that with the exception of opportunities for regular runs as a result of new lines and additions to the service, a motorman or conductor is frequently compelled to serve as long as eight years before he obtains a regular run. During a large part of this time he "bucks the list." He said that he was both unwilling and unable to subscribe to a rate of wage which he considered entirely inadequate.

Pittsburgh Employees Receive Increase of Seven Cents

After negotiations lasting six weeks officials and employees of the Pittsburgh Railways entered into a compromise agreement on May 22 whereby the men will receive an increase of 7 cents an hour effective May 1. The vote was 836 for acceptance and 667 for rejection with the alternative of arbitration between 60 cents an hour, the present rate, and 80 cents, which was the original demand of the carmen.

The new and old wages in cents per hour are as follows:

| | New | Old |
|------------------------------------|-----|-----|
| For the first three months..... | 60 | 54 |
| Next nine months..... | 65 | 58 |
| After the first year's service.... | 67 | 60 |

When the wage matter first came up for discussion the receivers offered 66 cents an hour maximum in answer to the carmen's demand for 80 cents an hour, but the employees rejected this offer by a vote of 2,177 to 9. The next step was the proposal advanced for arbitration of the matter between 66 and 74 cents an hour and later between 66 and 72 cents an hour. It is said the men wanted 70 cents an hour, which would have restored the old 1920-1921 wage schedule.

In the matter of working conditions a number of minor changes were obtained by the carmen. Under the new agreement the average length of day is eight hours and fifty-one minutes.

\$1,000,000 Electrification Work to Proceed

Construction of the interurban line from Dallas to Denton, Tex., through electrification of the lines of the Missouri-Kansas-Texas Railroad by the owners of the Dallas (Tex.) Railway, is expected to begin by June 15, according to Richard Meriwether, vice-president and general manager of the Dallas Railway. This announcement was made following a decision by the State Supreme Court of Texas, in which the motion was denied that had been made for rehearing in the injunction proceedings brought in the District Court at Dallas and appealed through the courts to the court of last resort.

Surveys for the electrification of the line have already been made under the direction of B. R. Brown, chief engineer. The work is expected to cost about \$1,000,000 and is to be completed within a year from the date that work is begun.

\$4,000,000 Expenditure Before Public

Pershing Square Subway Franchise for Pacific Electric to Be Determined by Los Angeles Voters

Recently the Pacific Electric Railway applied to the City Council of Los Angeles for a subway franchise from Pershing Square westerly to First and Glendale Boulevard. The City Council on May 16 adopted a resolution to place the issue on the ballot for the election of June 5.

The City Attorney in passing on the matter states that the question of "easements or rights-of-way" offered the only possible obstacle to the construction of the proposed subway terminal under the city's park property. The city attorney further states that should the voters decide in favor of the construction of the subway under the park the action would possibly be sustained by the court.

The Pacific Electric Railway's plan calls for a series of subways branching from Pershing Square, with view of removing its interurban trains from the streets of Los Angeles. Its suggestion had the approval of the Community Development Association, Los Angeles Planning Commission, Los Angeles Traffic Commission, Los Angeles Chamber of Commerce and several other prominent associations interested in the traffic problem of the city. The company states that it is essential that an early decision be reached by the city in the matter of the franchise for the proposed Hollywood rapid transit subway; that is, whether the subway should end at the Hill Street terminal of the company or under Pershing Square. The railway, it is stated, has held up its plans to construct a subway to terminate at its Hill Street station pending a decision on an alternate plan to have the terminal underground at Pershing Square. The subway, for which the railway received a franchise sometime ago, will provide for rapid transit service to the Hollywood district as well as the San Fernando Valley territory. It will cost approximately \$4,000,000. The alternate plan will make the Hollywood and San Fernando Valley subway a unit of a comprehensive subway system serving all parts of the city. It is stated that work on either one or the other plan will be commenced just as soon as the June election is over.

Following is the resolution placing the Pershing Square project on the ballot, as passed by the Los Angeles City Council:

Shall the City Council and the Board of Park Commissioners authorize and require the Pacific Electric Railway to construct and operate below the surface of Pershing Square certain subway tunnels and appurtenances, under plans to be approved by the city and so designed as to become a part of a general and comprehensive subway system; such authorization to be upon fair and reasonable terms for the protection of the city's needs; provided that such construction shall not interfere with the use of the surface thereof for park purposes, except for the necessary approaches to the subway?

The city's action in deciding to submit the issue to the people at the June

5 final municipal election was based on the city attorney's ruling that it is "feasible and proper" that the matter be put to a vote, as under the authority of the Los Angeles city charter, the city attorney held that the City Council and the park commission have authority to grant easements and rights-of-way to public utility corporations over public parks.

Immigration Restriction Permanent

Official circles in Washington favor establishment of the immigration quota on the 1890 basis. This arrangement

would make it possible to draw immigration largely from the North of Europe. It is believed, however, that no matter what the basis may be that is finally decided upon, the restriction of immigration will be unquestionably permanent. Any relief from the present immigration law will come from a revision of the basis, and not by any general relinquishment of limitation. Public sentiment is strongly opposed to any large increase in immigration, since it has been learned that the public must take care of the unemployed in the off peak period, and, furthermore, because the capacity for assimilation is already taxed.

\$4,000,000 Needed for Improvements

Manager for Receiver at St. Louis Sees Need for This Expenditure— Says New Franchise Should Be Passed in Interest of Company and Public

Invited to a meeting of a civic association in St. Louis recently to tell why extensions of car lines had not been built or when they would be built, Col. A. T. Perkins, manager for the receiver of United Railways, St. Louis, stated he hoped for and expected a decision in the valuation case by July 1, and that he is preparing a budget of proposed improvements to be presented to the reorganization committee. If he has anything to do with the property after it is reorganized he will ask for at least \$4,000,000 to make service extensions.

Besides an adjustment of the valuation case by the Missouri Public Service Commission, necessary in order to get capital under a reorganization, Colonel Perkins said in his opinion the second requisite should be an entirely new franchise to run for fifty years, and so framed as to give the city the right of purchase. Existing franchises, he said, are complicated, and in many respects are not fair and just.

In the present situation, said Colonel Perkins, the proper thing to do is for the public to go into the matter of a franchise fully and fairly and decide upon a grant to permit healthy growth of the railways for years to come.

Just how much of their taxes the car riders desire shall be paid through the fare boxes is one of the points to be decided, and they should be fully advised as to the facts. The company last year paid more than \$1,800,000 in straight taxes, plus \$477,000 for paving. Almost eighteen and one-third mills from every car fare goes for taxes.

The management has built 101 motor cars and purchased fifty trailers and ten one-man cars. There are 100 more motor cars of the 700 type under construction in the company's shops. Seven new substations have been constructed.

The management of United Railways, said Colonel Perkins, is disposed to follow the plans of the City Plan Commission as far as possible in contemplating the building of new lines

and the rerouting of old ones. Rerouting is greatly needed. The old constituent companies were in competition and the result was a duplication of service.

As to extensions, he explained that under the receivership the Federal Court permits the management to go as far as funds will permit in reconstruction work and to improve the property as it stands to take care of growing traffic, but for several reasons extensions are not possible until there is a reorganization. Bondholders and creditors from all parts of the country are ready to come into court at any time and oppose the spending of money which they think might affect their interests. So the court's order is that the property be conserved for the benefit of creditors pending reorganization.

There has been much loose talk about the pending valuation case, said Colonel Perkins. It has taken years of study to see what is in this enormous property. While the management does not expect to get a valuation within millions of the present reproduction cost, it does expect a fair figure from various standpoints. In the meantime, he added, the city's representatives should have worked in harmony with the management instead of setting up an arbitrary figure. If the city's figure were accepted, he declared, the property would be thrown into the courts and tied up for years with remote chances of extensions of service.

In a round-table discussion, a number of points relating to the transportation situation were brought out in answers to questions by members of the association, as follows:

Colonel Perkins was about to lease a number of buses some time ago to serve as feeders but was informed he could not do so under the Federal Court's general order. Under a reorganization he would favor the purchase of buses as one of the first moves to be made.

Most of the delays in service are caused by blockades in the congestions of downtown streets. There have been very few failures in car equipment.

Weekday traffic in January, February, March and April of this year has been heavier than in any other four months of the company's history, but Sunday travel is lighter probably on account of the increased use of the private automobile.

Baseball crowds are not profitable to street railways.

The zoo, in Forest Park, and the Missouri Botanical Garden are drawing the largest crowds, and a special loading station will soon be provided for the zoo.

A rainy day means a loss of from 50,000 to 200,000 passengers.

A reward of at least \$1,000 would be paid by the United Railways to anybody who will invent a machine to dress paving blocks. This work is now done by hand.

One of the longest car rides in St. Louis without changing cars is on the Bellefontaine lines—16½ miles.

Experiments with the weekly pass system in other cities is being watched closely. Reports so far do not indicate much success.

Fares in St. Louis County should be readjusted because they are inequitable. On some lines passengers are paying for more than they get, and on others not enough.

Asked about municipal ownership, Colonel Perkins expressed the opinion that in view of Seattle's experience and the necessary restoration of a 10-cent cash fare, three tokens for 25 cents out there, St. Louis is not likely to favor this idea.

There are 20,000 citizens in the United Railways' family, he concluded, and they expect a fair deal from the people of St. Louis.

The Grand-Meramec Improvement Association gave Colonel Perkins a vote of thanks for his visit and speech.

Wage Situation Critical in Chicago

Indorsement of President Henry A. Blair's attitude on the demands for higher wages was made by the board of operation of the Chicago Surface Lines at a meeting held on May 23. Mr. Blair in a previous meeting with the representatives of the employees' union, Division 241 of the Amalgamated, had pleaded inability to pay the increase of 10 cents an hour over the present wage scale of 65, 68, and 70 cents, unless an increase in revenue is obtained. With this endorsement by the board there is little chance of a wage increase. The wage scale has lately become the principal issue under discussion, with the other two original demands, namely, one day a week off with pay and elimination of one-man car operation, receiving little or no consideration. The stand taken by the board was communicated to the representatives of the union at a meeting held on May 25. They will in turn present the decision to the men at a special meeting to be called on May 28.

Representatives of the unions have asked the Governor to use his influence with the Illinois Commerce Commission to urge it to recommend an increase in rates of fare for the Surface Lines in order that the company may meet their wage demands.

A meeting between Mr. Blair and Mayor Dever was held on May 24, which resulted in the appointment of a committee to thrash out the controversy before a strike is called. The success attained by a similar committee last year in abatement of the strike after it was called led the Mayor to make the appointment in anticipation of the strike this year.

A conference held on May 22 between

Britton I. Budd, president Chicago Elevated Railways, and officials of Division 303 developed a dead-lock which might have broken off negotiations entirely, but for the hope that some outside influence to provide the company with increased revenue would develop. Mr. Budd had informed the representative that the company could not meet the 10 cents an hour wage increase without an increase in fares. Negotiations will, however, be continued at a meeting to be held on May 29, at which time the attitude of the men as voiced at their meeting on May 26 will be represented.

Schenectady Railway Enjoins City

Secures Temporary Order Restraining Mayor from Enforcing His Dictum Directing Non-Operation of Cars

The Schenectady Railway on May 18 obtained a sweeping injunction order from Supreme Court Justice Edward M. Angell of the Fourth Judicial District compelling the city to appear in the Supreme Court at Hudson Falls on June 9 and show cause why it should not be permanently restrained from enforcing Mayor Whitmyer's dictum directing non-operation of cars during strike. When on the following day George B. Smith, Schenectady counsel, in special term before Justice Edward M. Angell moved for modification of the injunction order it was denied.

The original order restrains the city from interfering in any way with the Schenectady Railway in its efforts to operate cars during a strike of its employees. Mr. Smith told the court the order virtually prevented police officers from maintaining peace and order and enjoined them from doing their sworn duty.

In connection with these moves it should be recalled that just before the strike vote was taken John E. Cole, Commissioner of Public Safety, told the men that in the event of a strike the cars would be kept in the carhouses. The city administration has been openly sympathetic with the strikers.

State Industrial Commissioner Bernard L. Shientag telegraphed from New York to Harry B. Weatherwax saying that unless satisfactory adjustment, temporary or otherwise, of the street railway strike is reached before Tuesday afternoon he would hold a public inquiry as to the cause of the strike pursuant to the provisions of the labor law. Mr. Weatherwax replied that he had determined upon a definite time for resuming operation, but that he did not propose to give out that information.

Mr. Weatherwax reiterated his willingness to arbitrate with all of the men, but not with the union. He denied that he was opposed to the principles of collective bargaining, but asserted he was opposed to the leadership of the union.

On May 21 100 strike breakers arrived in Schenectady and were quarantined in the Fuller Street carhouse.

The same day the city engineer submitted a report to the Common Council designating practically every street over which the railway operates in the city to make paving repairs. Under the law unless the company undertakes the work within thirty days after being notified so to do the city itself can perform the work and charge it to the company. The railway company operates about 25 track-miles in the city. Figuring on a basis of \$12 per lineal foot for concrete ballast, this would mean an expenditure of about \$1,500,000 for paving repairs.

A plan advanced on May 23 by a citizen's committee would reinstate all "men on strike" in their former positions as of May 16; representatives of the company and a committee of the men to formulate rules, fix wages and working conditions for the ensuing year, meeting within ten days after the resumption of operation. The operatives voted to accept a compromise offer if the old working contract would be included in arbitration, the opening paragraph of which reads: "This agreement shall be entered into between the Schenectady Railway and Local Division 576 of the Amalgamated Association."

This interpretation Mr. Weatherwax declined to accept on the ground that it would be recognizing the union.

Approves Modified Ordinance.—The bond owners protective committee of the bankrupt Saginaw-Bay City Railway has given its approval to the modified street car-bus ordinance. A special election has been ordered by the City Council for Monday, June 25.

Wages to Be Arbitrated.—Men of the Eastern Massachusetts Street Railway, Boston, have voted to accept the recommendations of the wage conference committee which were recently submitted for their approval. The question of wages will now go to arbitration.

Mistake Made in Wage Announcement.—The Cedar Rapids & Marion City Railway, Cedar Rapids, Ia., has increased the wages of its trainmen 5 cents an hour effective May 1. It was incorrectly stated in the *ELECTRIC RAILWAY JOURNAL*, issue of May 12, that the wages had been advanced 10 cents. Prior to May 1, the maximum wage was 45 cents an hour. The maximum is now 50 cents.

Five New Books in One Week.—This is the record of the McGraw-Hill Book Company during the week ended May 26. The five books just published are: "The Ore Magmas," 915 pages, by J. E. Spurr, "Principles of Chemical Engineering," 637 pages, by Professors Walker, Lewis and McAdams; "Applied Mechanics," 293 pages, by Professor Poorman, "Foundations, Abutments and Footings," 414 pages, and "Structural Members and Connections," 611 pages. The two last mentioned are the first of a series of six volumes of a structural engineers' library compiled by a staff of specialists, with Professors George A. Hool and W. S. Kinne of the University of Wisconsin editors-in-chief.

Financial and Corporate

Receiver's Report Encouraging

Traffic Returning in Kansas City, Mo., but End of Receivership Is Apparently a Long Way Off

The total railway operating revenue of the Kansas City (Mo.) Railways in 1922 was \$10,404,744, an increase of \$424,698 over that of 1921, or 4.26 per cent. The auxiliary operating revenue of the property showed a decrease in 1922 of \$236,993, so that the total operating revenue made a net gain for the year of \$187,705. It is explained that the reason for the decrease in auxiliary operating revenue was due to the discontinuance by the Kansas City Light & Power Company of purchasing a portion of its electrical energy from the railway during the year 1922, when the power company completed its own generating station. It will be noted, however, that a material reduction in auxiliary operating expenses has offset this loss of revenue.

The income statement shows gross income of \$1,490,525 in 1922, as compared with \$1,370,012 in 1921, an increase of \$120,512 or 8.80 per cent. No deduction is made in these figures for depreciation. The gross income, however, is arrived at after deducting all operating expenses, including taxes, and after providing for all personal injury and damage claims incurred during the receivership, and after payment in 1922 of \$77,100 allowed by the court for rental of the Intercity viaduct from date of the receivership to Dec. 31, 1922, and for which rental no accrual had been previously set up.

The receivers report the gross income for the first quarter of 1923 as \$388,550, being an increase of \$43,332 over the corresponding three months of 1922; the 1923 figures are after setting aside \$43,649 for additional maintenance of way and structures when weather conditions are favorable for such work.

The number of revenue passengers carried in 1922 was 136,076,541, against 130,843,482 in 1921; transfer passengers carried in 1922 numbered 68,191,873 and in 1921, 63,880,843. Including employee and free passengers carried the lines transported 205,544,606 passengers in 1922 and 196,023,605 in 1921. The revenue derived from paying passengers averaged 7.51 cents in 1922, against 7.56 cents in 1921. The average fare collected per revenue, transfer and free passenger during 1922 was 4.97 cents and in 1921, 5.01 cents.

There has been no change in fares in almost four years past; tickets are still sold on a 7-cent basis, token fares at 7½ cents and cash fares at 8 cents per passenger; these rates were last extended from November, 1922, to May

18, 1923, by the Public Service Commission of Missouri. The same rates are in effect in Kansas. Children's fares are practically half the regular rates.

The number of revenue passengers carried in 1922 was the second largest in the history of the property, but still approximately 1,000,000 less than in 1917, although in this interval the population of Kansas City, Mo., and of Kansas City, Kan., has increased from 415,000 to 470,000, or 13 per cent. The

INCOME ACCOUNT OF THE KANSAS CITY RAILWAYS

| | 1922 | 1921 |
|----------------------------------------------|--------------|--------------|
| Total railway operating revenue..... | \$10,404,744 | \$9,980,046 |
| Auxiliary operating revenue..... | 257,008 | 494,002 |
| Total operating revenue.. | \$10,661,753 | \$10,474,048 |
| Railway operating expense.. | \$8,605,735 | \$8,375,225 |
| Auxiliary operating expense.. | 145,306 | 312,538 |
| Total operating expenses.. | \$8,751,042 | \$8,687,764 |
| Net operating revenue.... | \$1,910,711 | \$1,786,284 |
| Taxes..... | \$533,593 | \$478,622 |
| Operating income..... | \$1,377,117 | \$1,307,661 |
| Misc. non-operating income—joint..... | 14,133 | 16,598 |
| Gross income—joint.... | \$1,391,251 | \$1,324,259 |
| Net surplus income above 6 per cent—Mo. | | |
| Gross income joint—company's proportion..... | \$1,391,251 | \$1,324,259 |
| Interest on securities owned..... | \$91,977 | \$38,470 |
| Interest on bank balances.... | 7,275 | 7,282 |
| Bond exchange fees, etc..... | 21 | |
| Misc. non-operating income—company..... | \$99,274 | \$45,753 |
| Gross income company.... | \$1,490,525 | \$1,370,012 |
| Interest on: | | |
| Funded debt..... | \$1,683,810 | \$1,683,810 |
| Receivers' certificates.... | | 3,776 |
| Notes payable..... | 159,454 | 164,734 |
| Injury and damage cert., Mo..... | 5,714 | 5,714 |
| Injury and damage cert., Kan..... | 1,863 | 1,863 |
| Other obligations..... | 4,603 | 353 |
| Amortization of discount on funded debt..... | 4,028 | 50,861 |
| Miscellaneous debits..... | 32 | 530 |
| Interest on: | | |
| Mortgages payable..... | 820 | 1,257 |
| Wyandotte Co. bonds.... | 16,504 | 16,504 |
| Bondholders' pro. com. notes..... | 32,198 | 32,198 |
| Total deductions from gross income..... | \$1,909,030 | \$1,961,604 |
| Net income..... | \$*418,584 | \$*591,591 |

*Deficit

receivers estimate that in 1922, 24,000,000 more passengers were carried in privately-owned automobiles than were carried in such vehicles in 1917. It is explained by the chairman of the protective committee for the holders of the first mortgage bonds that the elimination of jitneys, which has been practically accomplished, is the one thing that has made possible the operation of this property on such a basis that operating expenses and taxes have been paid out of earnings. Had the jitneys not been curbed, either a considerably higher fare would have been necessary or the loss to the property would have been so serious that consideration would necessarily have been given to the abandonment of service.

On Dec. 29, 1922, the receivers by direction of the court abandoned service on the elevated road between Kansas City, Mo., and Kansas City, Kan., as a result of the report of the engineers of the receivers and of the two cities that the continued operation of cars over the structure would be extremely dangerous because of the fact that the structure is worn out. The engineers also reported that repairs to the structure are impossible as the structure is so light and the wear has been so great that repairs cannot be made.

On Jan. 31, 1923, certain members of the first mortgage bondholders' committee, certain members of the note-holders' committee and a representative of the second mortgage bondholders met in conference in Chicago and it was the unanimous sentiment of the representatives of the security holders that some material concessions should be sought with respect to obligations now imposed against the property in the event the rebuilding of the structure be ordered at the expense of the estate. The estimated cost of such reconstruction is \$550,000. Due to the abandonment of service over the elevated road, routes formerly operating thereover have been detoured on other lines at some increase in cost due to the lengthening of haul. At an informal discussion of the matter with the court, M. A. Traylor, chairman, Silas H. Strawn and Richard J. Higgins, counsel for the committee, presented the views of the security holders to the court. No order has been made by the court requiring the rebuilding of the structure, but the matter is still pending.

The principal liabilities of the property outside of secured debts are the claims for personal injury and damages, which must be disposed of before reorganization is possible. Representatives of these claimants have raised the issue of priority of these claims over that of the first mortgage bonds and secured notes. The question has not yet been argued before the court, but it is hoped that the matter will come up for disposal in the near future.

The Kansas City Railways' franchise in Kansas City, Kan., expired by limitation on Dec. 25, 1922. The operations of the receivers in Kansas City, Kan., have continued without interruption or question. This grant is regarded as unfavorable in many respects to the owners of the property, so that the expiration of the franchise is not considered a detriment to the property.

New Interests in Control of Quebec Property

Actual change of control of the Quebec Railway, Light, Heat & Power Company has been brought about, according to the *Canadian Financial Post*, by the acquisition by the Shawinigan Company of a large block of shares in the Quebec Railway, sufficient to give the Shawinigan Company control of the situation.

As noted in the *ELECTRIC RAILWAY JOURNAL* for May 19, page 863, the

president, E. A. Robert, has resigned, and a new board of directors has been appointed which includes some of the former directors of the company who have been interested in its operation for a long time and representatives of the Shawinigan Company. Julian C. Smith, Montreal, vice-president and general manager of the Shawinigan Water & Power Company, becomes president.

Mr. Smith indicates that the company's properties will require very substantial sums to be expended in the railway, light, power and gas departments in order to provide adequately for the additional business which is available. The new directors are:

Julian C. Smith, Howard Murray, W. S. Hart, C. E. Taschereau, M. P., J. H. Fortier and James McCarthy, representing the new interests, and Lorne C. Webster, J. P. B. Casgrain, A. Turgeon, D. O. L'Esperance and Charles G. Greenshields, of the former board.

Julian C. Smith, president; Howard Murray, vice-president; W. S. Hart, treasurer; James Wilson, secretary, and Arthur Lemoine, assistant secretary.

The question of the relationship of the Quebec Railway with the citizens of Quebec comes up now. Mr. Robert planned to make arrangements with the city for operation of the tramways and gas service on the service-at-cost basis, but the attitude of the new management toward this proposal is not known.

Utility Engineer and Accountant Named in Louisville

In a recent communication to the lower board of the General Council, Mayor Quinn of Louisville announced the appointments of George W. Hubley and Charles Rosen as engineer and accountant respectively of the new public utilities supervising bureau.

The Utilities Bureau was formed to supervise the utilities, its principal work being in accounting and recording of costs, and being a sort of third party in deciding questions of rates allowed utility companies, when a need of adjustment of rates is shown. The bureau will not cost the city a nickel, as the Louisville Railway, Louisville Gas & Electric Company and Louisville Home Telephone Company each agreed to pay \$10,000 a year for the upkeep of the bureau. Heretofore there were no records available in disputes and the matter of rate adjustment was a hard one to handle.

Detroit Income \$80,978 in April

The net income of the City of Detroit Department of Street Railways during April was \$80,978, being obtained after meeting all the usual operating expenses and providing reserves to meet sinking fund and interest payments. The net income during March was \$98,025, but it is explained that March had thirty-one days, of which five were Saturdays and four Sundays, while in April there were five Sundays and four Saturdays. The highest revenues are obtained on Saturdays, whereas Sundays usually show a falling off.

During April 31,745,805 revenue passengers and 9,939,732 transfer passengers were carried, a total of 41,685,537. In March the total of passengers carried was 43,227,309.

Operating expenses for April were \$1,290,077, as against a total passenger revenue of \$1,693,767. The daily average expenses were higher than in March, due to increased maintenance

work, which better weather conditions made possible.

April marked the first month the Detroit Street Railway has been placed on the departmental budget system. It is believed with the issuance of the June report it will be possible to make comparisons with the similar month in 1922 for the first year of operation by the city has now been ended.

City and Company \$6,000,000 Apart

Report of City Engineer at Norfolk, Va., Indicates Wide Difference Over Valuation in Case Before Commission in Which Company Is Seeking Seven-Cent Fare

The inquiry into the financial and physical condition of the railway division of the Virginia Railway & Power Company at Norfolk, Va., ordered by the city of Norfolk as a result of a petition by the company for a 7-cent fare has been completed by Edwin Wortham, consulting engineer of Richmond. The survey was made with the co-operation and assistance of Walter H. Taylor, 3d, city engineer of Norfolk. On the recommendation of the engineers that a 5-cent fare is feasible in Norfolk the city is fighting the petition before the State Corporation Commission.

The appraisal by the engineers for the city was made upon the theory of reproduction cost new, less depreciation, plus a value for the enterprise as today established and developed in excess of figures ascertained from inventory, and prices prevailing during the year 1922.

The reproduction cost new was found

to be \$7,242,195. The property is declared to have depreciated to the extent of 27.1 per cent (\$1,962,005), and, therefore, to possess a sound value of \$5,280,190. To this the engineers added development expense of \$792,028, making a total of \$6,072,218, upon which the company is entitled, if it can, to earn an inviting return. The report says:

As is well understood, the property has not been maintained as it should have been. Large sections of track and other structures must soon be rebuilt. This reconstruction, as deferred maintenance, in large part should be cared for from revenue. Because of recent compliance with this sound business idea and upon the theory of continued compliance therewith for several years to come, and for the reason hereinabove set forth, we admit and suggest a value of \$792,028 in excess of the present worth of the physical property.

Three years have passed since an appraisal of this property by the firm of Stone & Webster. During this period the company has engaged extensively in new construction and repairs, and has at the same time removed track of more than equal lengths to the track laid. We have found it almost impossible to connect the very minutely recorded work of Stone &

COMPARISON OF NORFOLK VALUATIONS

Statement of estimated cost to reproduce new, the property used in railway operation in Norfolk City and County, as of 1920, by Stone & Webster, and the estimated cost new, with its "sound value," as of January, 1923, by the City of Norfolk.

| | Stone & Webster Cost, 1920 | City Cost New, 1923 | City "Sound Value," 1923 |
|------------------------------------------------------|-------------------------------|------------------------|-----------------------------|
| Right-of-way..... | \$255,785 | \$146,033 | \$146,033 |
| Land..... | 893,764 | 331,264 | 331,264 |
| Grading..... | | | |
| Ballast..... | | | |
| Ties..... | | | |
| Rails and fastenings..... | 3,337,961 | 2,756,570 | 1,650,452 |
| Track, special work..... | | | |
| Track, laying and surfacing..... | | | |
| Paving..... | | | |
| Roadway tools..... | 4,419 | 4,133 | 3,422 |
| Bridges, trestles and culverts..... | 532,284 | 331,582 | 233,443 |
| Crossings, fences, etc..... | 10,320 | 9,082 | 7,266 |
| Signals..... | | | 20 |
| Telephone and telegraph..... | 5,024 | 4,521 | 3,617 |
| Poles and fixtures..... | 80,319 | 84,823 | 64,558 |
| Underground conduits..... | 16,725 | 16,490 | 11,447 |
| Distribution system..... | 373,043 | 348,706 | 243,599 |
| Substation bldg..... | 46,627 | | |
| Shops and car houses..... | 341,544 | 212,080 | 180,422 |
| Miscellaneous buildings..... | 110,203 | 94,718 | 73,675 |
| Docks and wharves..... | 78,531 | 116,596 | 73,868 |
| Substation equipment..... | 260,830 | | |
| Shop equipment and tools..... | 42,527 | 23,534 | 10,000 |
| Park and resort property..... | 490,545 | | |
| Revenue cars..... | 921,419 | 1,031,849 | 696,562 |
| Electrical equipment of cars..... | 517,918 | 511,623 | 360,052 |
| Other rail equipment..... | 31,530 | 25,071 | 16,219 |
| Miscellaneous equipment..... | 28,177 | 27,160 | 10,608 |
| Furniture and fixtures..... | 4,082 | 2,858 | 2,287 |
| Contractors' services..... | 516,570 | | |
| Taxes during construction..... | 101,773 | 69,260 | 69,260 |
| Interest during construction..... | 838,079 | 213,662 | 213,662 |
| Administrative organization during construction..... | 116,259 | 78,000 | 78,000 |
| Legal expenses during construction..... | 77,506 | 52,000 | 52,000 |
| Engineering cost..... | 232,517 | 150,000 | 150,000 |
| Organization Prior to Construction | | | |
| Preliminary investigations(a)..... | 15,017 | | |
| Cost of selling securities(b)..... | 567,000 | 366,000 | 366,000 |
| Permanent organization(c)..... | 106,571 | 50,000 | 50,000 |
| Interest on a, b and c..... | 165,261 | | |
| Material and supplies..... | 104,869 | 128,200 | 127,346 |
| Minimum cash balance..... | 118,400 | | |
| Totals..... | \$11,343,399 | \$7,242,195 | \$5,280,190 |

Webster with the physical properties, as they stand today, and therefore, have not been able to debit and credit the inventory preparatory to applying new unit prices. It has been necessary to a very large extent to prepare an entirely new inventory. The items of the Stone & Webster report though paralleled by us, cannot be weighed and compared, except as to totals, representing periods three years apart. We have not included in this inventory property to the value of \$1,717,199, which for sound business reasons should not be classified as railway property.

By deducting this \$1,717,199 from \$11,343,339, the total of Stone & Webster's appraisal of approximately the same inventoried properties, we have \$9,626,200. To this must be added capital expenditures of \$877,272 for the years 1920-21-22, less cars retired, \$223,176, making a total of \$10,280,296, in comparison with reproduction cost by the city as of Jan. 1, 1923, of \$7,242,195.

All of the above items, except worn-out cars, have value as stated, but according to our convictions do not belong in the column of assets of railway property, intended to establish a fair value for rate making purposes.

A study of the company's statements of bonds and stock allocated to the Norfolk Railway division lead the engineers for the city to conclude that the percentage of fixed interest bearing liabilities was higher than it should be and that this in turn accounted for the abnormally high amount per year for fixed charges.

The engineers say there has been a marked improvement in all branches of the service and conditions of the property since the war. They then say:

Since the first of this year the company has been figuring its depreciation and renewal reserve on the basis of 3 per cent of railway depreciable property, ordinarily a sound and sufficient amount. Had this policy been started sooner, the funds available for this purpose would have been more nearly in keeping with the requirements. It is our conviction, however, that because of accrued depreciation a greater amount must be made available and spent for this purpose from revenue for the next few ensuing years, as hereinbefore stated.

The ordinary expense of the Norfolk system compares favorably with other places. Certain economies of operation, however, should be adopted which would speed up the net running time, thereby reducing the expense of hauling each passenger, which in turn would mean higher net earnings and dividends to the company, as well as better service for the rider.

Much has been said of the expenses of this company due to franchise requirements, as these requirements regulate paving upon the streets of the city of Norfolk occupied by the tracks. You recall an agreement upon this point when phrasing a new franchise to the extent that in paving a street initially, the city should pave from curb to curb including the car track area, but that the maintenance of this pavement ever after should be an obligation of the transportation company. This we think fair and correct.

Of the local traveling public, it was found by the engineers that 85 per cent or more avail themselves of the street cars and less than 15 per cent ride in jitneys. The day has not yet arrived, say the engineers, when capital will invest in jitney transportation in cities of the size of Norfolk sufficiently to establish a dependable service. There can be no doubt as to a choice between the two systems, should it become necessary to make such a decision. The city's engineers realized that both are here to stay, but they do say that if possible the two modes should be so regulated as not to injure one another financially. When this is not the case the 85 per cent of traveling public suffers for the benefit of a comparative few favored citizens.

APPRECIATION EXPRESSED FOR COMPANY CO-OPERATION

In calling attention to exhibits Nos. 6 and 10 the engineers say that the present earnings of the company during the twelve months prior to this report, except for the short period of the strike, evidence a net return of 7.1 per cent upon the "sound value," found by them. In conclusion they express the opinion that the initiation of additional economies in operation, relief from unjustified short-haul jitney competition, and legitimate credit to the Norfolk Railway division of revenue from holdings in other companies, would permit the return to a 5-cent fare, with a reasonable charge for transfers.

Appreciation is expressed by the engineers of the courtesies extended by President Wheelwright of the Virginia Railway & Power Company in furnishing them information promptly and in permitting access to the company's records.

The figure of 7.1 per cent noted previously as being the net return upon the "sound value" is disputed by the Virginia Railway & Power Company on the ground that \$50,000 a year interest on bonds of the Norfolk Light & Power Company owned by the company is included in its makeup. The company holds that this \$50,000 revenue from holdings in the light and power company should not be included in this figure, which would bring the 7.1 down to about 6 per cent.

Valuation Ruling by Supreme Court

Highest Court Reaffirms Its Stand that Contemporary Cost Must Be Considered in Valuations

Reaffirming and strengthening its previous position that contemporaneous reproduction costs must be taken into consideration in fixing rates for public utilities, the United States Supreme Court on May 21 reversed the Missouri Supreme Court which had upheld an order of the Public Service Commission directing the Southwestern Bell Telephone Company to reduce rates.

The court was unanimous as to the reversal in this specific case, but Associate Justice Brandeis filed a separate opinion, with which Associate Justice Holmes concurred. Associate Justice McReynolds read the majority opinion, which dwelt at length upon the necessity for taking into consideration costs of physical reproduction at the time new rates are ordered by a regulatory body. Justice Brandeis agreed with his associates of the court in the reversal on the ground that the rates declared by the Public Service Commission were not sufficient to insure a fair return on a "prudent" investment, but in his separate opinion he declared that the theory of contemporaneous reproduction costs is "legally and economically unsound."

A few days after Aug. 1, 1919, when telegraph and telephone lines were released from federal war-time control, the Missouri Public Service Commission issued an order to the Southwestern Bell Telephone Company to show cause why exchange rates should not be lowered and installation and removal charges abolished. The rates and charges then existing had been fixed by order of the Postmaster-General. Appraisals at St. Louis, Caruthersville and Springfield, which had been made before the war, were used by the commission at the hearing. The company contended that reproduction costs at the time of the hearing were considerably greater than the figures shown in these appraisals. Various items of expense also were disallowed, such as rental paid to the American Telephone & Telegraph Company for apparatus. Reductions were

| | Latest | Month Ago | Year Ago | Since War | |
|---------------------------------------------------|--------------|--------------|--------------|--------------|--------------|
| | | | | High | Low |
| Street Railway Fares* | May 1923 | Apr. 1923 | May 1922 | May 1921 | May 1923 |
| 1913 = 4.84 | 6.88 | 6.89 | 7.14 | 7.24 | 6.88 |
| Street Railway Materials* | Apr. 1923 | Mar. 1923 | Apr. 1922 | Sept. 1920 | Sept. 1921 |
| 1913 = 100 | 175 | 174 | 157 | 247 | 156 |
| Street Railway Wages* | May 1923 | Apr. 1923 | May 1922 | Sept. 1920 | Apr. 1923 |
| 1913 = 100 | 208 | 207 | 211 | 232 | 207 |
| Steel—Unfilled Orders (Million Tons) 1913 = 5.91 | Apr. 30 1923 | Mar. 31 1923 | Apr. 30 1922 | July 31 1920 | Feb. 28 1922 |
| | 7.29 | 7.40 | 5.10 | 11.12 | 4.14 |
| U.S. Bank Clearings Outside N. Y. City (Billions) | Apr. 1923 | Mar. 1923 | Apr. 1922 | Mar. 1920 | Feb. 1922 |
| | 15.00 | 15.43 | 12.24 | 18.54 | 10.65 |
| Business Failures Number | Apr. 1923 | Mar. 1923 | Apr. 1922 | Jan. 1922 | Sept. 1922 |
| Liabilities (millions) | 1,638 | 1,677 | 1,954 | 2,722 | 1,460 |
| | 51.66 | 60.62 | 73.09 | 105.7 | 32.51 |

Conspectus of Indexes

for May, 1923

Compiled for Publication in this Paper by Albert S. Richey Electric Railway Engineer Worcester, Mass.

| | Latest | Month Ago | Year Ago | Since War | |
|-------------------------------------------------------|------------|-------------|------------|-------------|-------------|
| | | | | High | Low |
| Eng. News-Record Construction costs 1913 = 100 | May 1923 | Apr. 1923 | May 1922 | June 1920 | Mar. 1922 |
| | 216.7 | 213.5 | 164.6 | 273.8 | 162.0 |
| U.S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100 | Apr. 1923 | Mar. 1923 | Apr. 1922 | May 1920 | Jan. 1922 |
| | 159 | 159 | 143 | 247 | 138 |
| Bradstreet's Wholesale Commodities 1913 = 9.21 | May 1 1923 | Apr. 1 1923 | May 1 1922 | Feb. 1 1920 | June 1 1921 |
| | 13.67 | 13.93 | 11.70 | 20.87 | 10.62 |
| Dun's—Wholesale Commodities 1913 = 120.9 | May 1 1923 | Apr. 1 1923 | May 1 1922 | May 1 1920 | July 1 1921 |
| | 192.9 | 193.1 | 166.1 | 263.3 | 159.8 |
| U.S. Bur. Lab. Stat. Retail food 1913 = 100 | Apr. 1923 | Mar. 1923 | Apr. 1922 | June 1920 | Mar. 1922 |
| | 143 | 142 | 139 | 219 | 139 |
| Nat. Ind. Conf. Bd. Cost of living 1914 = 100 | Apr. 1923 | Mar. 1923 | Apr. 1922 | June 1920 | Aug. 1922 |
| | 159.1 | 159.2 | 154.8 | 204.5 | 154.5 |

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population.

materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motor-men and conductors on 105 street and interurban railways in the United States, operating more than 100 passenger cars each, and weighted according to number of cars.

Street Railway Materials index is relative average price of

ordered. The company sued for relief from the order in the Cole County Circuit Court. That court upheld the order, as did the State Supreme Court, whereupon the company appealed to the United States Supreme Court on the grounds of confiscation.

In the majority opinion, the court of last resort declares that "obviously the commission undertook to value the property without according weight to greatly increased costs" of reproduction. A fair return must be assured, the court said, and "estimates for tomorrow cannot ignore prices of today."

Regarding the commission's action in disallowing rental paid the American Telephone & Telegraph Company for apparatus, the majority opinion declares that this appears to be a fair system, not extraordinary in business, and adds that "it must never be forgotten that while the state may regulate with a view to enforcing reasonable rates and charges, it is not the owner of the property of the public utility companies and is not clothed with the general power of management incident to ownership."

Elimination of Tax-Exempt Securities Improbable

The best opinion in Washington is that the proposed federal legislation to eliminate tax-exempt securities is doomed to fail. The relief from the impositions on such issues, sought by large users of money, such as the public utilities, whose securities are taxable, will have to be sought in other directions. This matter failed to come to a vote in the last Congress, but it is expected it will be brought up again before the next Congress. Passage of such a measure, however, is considered very unlikely.

Sale of Toledo & Western Will Be Advertised

A decree in foreclosure against the Toledo & Western Railroad, has been issued by Federal Judge John M. Killits at Toledo and sale will probably be advertised shortly for a date in June. The receivers, Harry A. Dunn, Joseph A. Yager, and Albert Swartz, were made special masters to conduct the sale at the headquarters of the company at Sylvania, Ohio.

Underlying mortgages covering the property are the Toledo & Western Railway, first mortgage 5 per cent bonds for an aggregate of \$1,250,000 dated July 1, 1901, which with coupons due since July 1, 1920, amount with interest to a total of \$1,477,580; the Toledo, Fayette & Western Railway, first mortgage 5 per cent bonds for an aggregate of \$250,000 dated Nov. 1, 1902, which with unpaid coupons from July 1, 1920, and interest amount to a total of \$295,516. There was a second mortgage issued on April 1, 1905, known as first consolidated and refunding mortgage securing an issue of 5 per cent bonds. The principal amount was \$2,500,000 but only \$500,000 was issued and outstanding. With coupons

due since Oct. 1, 1905, this issue amounts to a total of \$1,192,048.

Bids must be accompanied by a deposit of \$55,000 in cash to insure good faith. The Cleveland Trust Company, as trustee, brought the action for foreclosure.

The line is about 60 miles in length from Toledo to Pioneer, Ohio, with a 20-mile branch line to Adrian, Mich.

B.R.T. Properties Sold Under Foreclosure

The Central Union Trust Company, as trustee of the Brooklyn Rapid Transit Company, acting under a decree issued by Federal Judge Mayer on April 5, sold for \$25,000,000 on May 21 first mortgage bonds of the New York Municipal Railway Corporation to the face value of \$57,735,000. Later in the afternoon E. Henry Lacombe, special master appointed under the decree, sold for \$10,000,000 all the holdings of the Brooklyn Rapid Transit Company.

At both sales there was only one bidder. Alfred E. Mudge of Rushmore, Bisbee & Stern, representing the Brooklyn Rapid Transit reorganization committee, presented bids on behalf of Albert H. Wiggin, Gerhard M. Dahl and Frederick Strauss, the purchasing committee under the reorganization plan. His bids, aggregating \$35,000,000 for the mortgage bonds and for the B. R. T. assets, were accepted and will be presented to Judge Mayer for approval.

A third sale, that of the property of the New York Municipal Railway Corporation and the New York Consolidated Railroad, its operating company, was to have been held, but it was postponed until May 29.

The sales of the bonds and property of the company are a step in the reorganization of the Brooklyn Rapid Transit Company, which is expected to take it out of the hands of the receiver. This is expected to take place within a few days. In anticipation a new company, the Brooklyn-Manhattan Transit Corporation, was incorporated on May 24 as the successor. On the same day the court confirmed the sale of the assets conducted on May 21 and referred to previously.

Auction Sales in New York.—At the public auction rooms in New York there were no sales of electric railway securities this week.

I. T. S. Merger Plan Approved.—The Illinois Commerce Commission on May 18 approved plans submitted to it for the consolidation of the Illinois Traction, North American Light & Power and other companies. Reference to this application to the commission has been made previously in the *ELECTRIC RAILWAY JOURNAL*.

Bonds Called for Redemption.—All Evansville & Princeton Traction Company bonds bearing the date of April 1, 1903, have been redeemed by the Southern Indiana Gas & Electric Company at 105 per cent of par and accrued interest. The total amount that remained outstanding on April 1 was \$250,000.

Redemption Date Announced.—All of the outstanding first mortgage 5 per cent gold bonds, dated Oct. 1, 1919, due July 1, 1924, Series A, and all of the outstanding first mortgage 6 per cent gold bonds, dated Oct. 1, 1919, due July 1, 1924, Series B, of the Paducah Electric Company have been called for retirement and will be paid on June 1, 1923, at their face value and accrued interest at the office of State Street Trust Company, trustee, Boston.

\$44,000 Note Issue Authorized for Improvements.—The Madison Railways, Madison, Wis., has been authorized by the Wisconsin Railroad Commission to issue \$44,000 of notes, \$37,000 of which will be used to provide funds to pay improvements to its East Johnson Street line.

Change of Name Contemplated.—The stockholders of the Scioto Valley Traction Company, Columbus, Ohio, will vote on June 7 on changing the name of the company to the Scioto Railway & Power Company. The question of taking care of the \$1,426,000 of first mortgage 5 per cent bonds, due Sept. 1, will also come before the meeting for consideration.

New Director for Lake Shore Road.—Harris Creech, who succeeded the late F. H. Goff as president of the Cleveland Trust Company, has been elected to succeed Mr. Goff on the directorate of the Lake Shore Electric Railway, Cleveland, Ohio. He has also been named to the board of the Cleveland, Painesville & Eastern Railroad, as the successor Mr. Goff.

Sale of Carhouse Property Confirmed.—Judge Julius M. Mayer in the Federal District Court at New York, has confirmed the sale at auction of the carhouse property of the New York Railways, bounded by Fourth and Lexington Avenues and Thirty-second and Thirty-third Streets, New York City. The property was purchased by Harry Newmark, Fred Brown and another, for \$1,600,000. The New York Railways is in the hands of a receiver.

Sale Under Foreclosure Ordered.—A decree has been entered in the United States District Court ordering the sale of the property of the Michigan United Railways to the highest bidder on June 30. The minimum bid to be received has been set at \$5,000,000. The sale will be held at Jackson, Mich. The plan under which it is proposed to carry out the reorganization of the company has been reviewed previously in the *ELECTRIC RAILWAY JOURNAL*.

Bonds Extended.—The \$500,000 first mortgage 5 per cent bonds of the Lehigh Traction Company, Hazleton, Pa., due on June 1 next are being extended for a period of ten years at the same rate of interest. On June 1, however, the bondholders will receive a bonus of \$7.44 upon each \$100 of bonds. The payment of the bonus will reduce the amount of the principal invested and by receiving the sum ten years in advance of the extended maturity date gives the investor 6 per cent instead of 5 per cent on his money.

Traffic and Transportation

Accident Map Useful

Los Angeles Company Emphasizes Places of Danger by Means of Red Buttons

The Pacific Electric Railway of Los Angeles, Cal., is constantly emphasizing the need of more care on the part of motormen in avoiding traffic accidents, and repeatedly urging the trainmen to "use more care."

This campaign gains its principal incentive through the medium of efficiently organized and active safety committees.

There are three division safety committees, one for each of the three divisional operated lines, and a central safety committee.

There are four safety meetings each month; one for each of the three division committees and one for the central committee.

Various methods are adopted for impressing more care upon the trainman's part, such as campaign drives of impressive talks to trainmen by the general claim agent and other representative operating officials. Examples of carelessness are vividly brought to the attention of the men to stimulate the element of precaution.

Furthermore, the employees' magazine each month devotes a page or two toward interesting the trainmen in this vital subject.

In this respect the company has pointed out that the vast number of automobiles now traversing the highways and streets, and parked along the curbs, has greatly increased the accident hazard and created a situation which makes it imperative that all concerned substitute "extraordinary care" for ordinary care if the accident record is to be lowered. The company has explained to the trainmen what is meant by "extraordinary care":

Less speed, operating under absolute control.

Keep a safe distance back of the vehicle ahead.

Being sure of clearance when passing vehicles.

In knowing that every congested area is a danger point.

In applying brakes earlier when traffic jam occurs.

A more frequent use of gong and whistle.

In knowing that any automobile may do the unexpected.

In taking no chances; the automobile fellow will do that.

And, notwithstanding all your care, if there should come a time when you do have an accident, get all the witness cards as a personal favor to you, that you may clear yourself of any liability.

Automobiles are becoming more numerous every day, which means an ever increasing army of irresponsibles, indifferent to the meager traffic laws or to the rights of others. Everything depends upon the care we exercise.

Ordinary care will not meet existing conditions, therefore, we must use extraordinary care; begin today!

Recently the company adopted a novel method of concretely impressing upon trainmen the necessity for precaution. At each of the division points in sev-

eral cities a large map of the city is prominently displayed which shows routes of the company's lines and the city streets traversed and crossed.

Whenever a street car has a collision with a vehicle on any street or at some particular street crossing, a red button is stuck on the map at the location of the accident. If several accidents happen at this particular location at subsequent periods of time, additional red thumb tack buttons are stuck on the map at the particular place. While trainmen are congregated about divisional headquarters before assuming or after leaving their runs, a point is made to impress upon them the value of this map record of accidents. The appearance of several buttons at one given location is, of course, an automatic signal of danger at that particular location.

Ladies Taken to Task by Portland Mayor

The somewhat strenuous efforts of the Housewives' Council of Portland, Ore., to resurrect the jitneys for the purpose of securing lower transportation rates have met with failure at the hands of a stern, unfeeling group of City Fathers, headed by Mayor George L. Baker.

The Housewives' Council is made up largely of ladies who are politicians first and housewives second if at all. The members turned to the jitney idea after their efforts to force the Public Service Commission to reduce the present 8-cent fare on the Portland Railway, Light & Power lines back to the lowly nickel had come to naught.

Mrs. Josephine Othus, president of the Housewives' Council, explained to the commissioners that they tried to get a 5-cent fare restored, and couldn't, and then decided that the next best move was to request the city authorities to repeal all existing laws governing jitney operation and allow the buses to run in competition with the trolley cars.

After a lengthy statement had been made by Mrs. Othus, supported by several other members of the delegation, Mayor Baker explained that he held no brief for the railway, but that he was unalterably opposed to allowing the jitneys again to run wild in the streets. He said:

We have had experience with the jitneys and know that they are a menace to the people and that they do not give adequate service. They are placed on the short runs, while the people in the outlying districts get no service at all. The voters of Portland have spoken, and unless the voters decide to return to jitneys I will oppose amendment of any ordinance that would bring about a return to the hectic days of jitney service.

Other members of the City Council took a similar position with the result that the request made by the Housewives' Council was placed on file.

Offers Plan for Traffic Relief in La Crosse

Pursuant to a request from the city authorities of La Crosse, Wis., for traffic rule suggestions, to the end that collisions between autos and street cars may be avoided and the number of other accidents lessened, R. M. Howard, vice-president of the Wisconsin Railway, Light & Power Company, operator of the local system in La Crosse and the line between La Crosse and Winona, Minn., has outlined a plan to alleviate the situation.

Mr. Howard first suggests the establishment and marking of arterial highways with the rule that all cars crossing or turning into these highways from a cross street be required to come to a full stop. Further, that parking should be prohibited on the principal streets of La Crosse for a distance of two blocks and that this principal street be one of the arterial highways. A third suggestion is that a rule be made, and penalties established to enforce it, prohibiting the crossing of streets in the business district by pedestrians at any point except on the established crossing.

Mr. Howard said he would like to have a month's trial of the plan of designating the principal street as an arterial highway with parking eliminated for a distance of two blocks or four blocks. He believed that the results in speeding up traffic and relieving the present congestion would be so satisfactory that the plan would be extended to other streets.

Withdrawal of Paving Obligation Ends Fare Controversy in Madison

The controversy between the city of Madison, Wis., and the Madison Railways in regard to fares and paving has at last been settled.

The settlement ordinance releases the Madison Railways from all obligations to bear any part of the costs of paving between the car tracks. The company must, however, bear the additional costs due to the presence of the railway tracks in the street. In consideration of such relief the company agrees to extend its tracks on East Johnson Street and to extend its tracks on Monroe Street as far as Crandall Court.

The Madison Railways immediately upon the passage of the ordinance withdrew its request to the commission for an increase in rates. The commission has ordered the company to extend its tracks, for it feels that the revenues of the company warrant an extension and that the part of the city in question is not being properly served at present.

The company will, no doubt, take steps at once to carry out the extensions and double tracking. Officials of the railway and the commission indicate that the likelihood has thus been removed of any increase in fares now or in the future.

Ten-Cent Fare in Seattle on June 23

According to present plans, fares in Seattle will return to the 8-cent basis on June 23, as Mayor E. J. Brown states that he will not veto the ordinance for higher fare passed by the City Council. The measure will be allowed to become a law without his signature.

The 5-cent fare has been in force since March 1, and the railway has consistently lost money until railway and city officials realized that a return to the higher fare is absolutely essential. The fare will be 10 cents cash, with three tickets for 25 cents.

With the higher fare voted, the way is now open to negotiate with the bondholders for an extension of the term of the railway purchase bonds, Council members point out. Four plans have been tentatively discussed, three of them providing for extension of the bonds to forty years, with interest at 4, 4½ and 5 per cent. The fourth plan provides for paying a fixed sum annually in addition to the interest so the bonds would be retired at the end of about forty years.

Queens County Adopts Boston Type of Transfer

The New York & Queens County Railway, Long Island City, has adopted the Moran type of transfer used on the Boston Elevated Railway, as described in the issue of this paper for Aug. 26, 1922. The only changes made from the Boston type were to print the transfer conditions on the face of the transfer instead of on the reverse side, thus saving a printing process, and to have the p.m. transfer good until 3 a.m. instead of 12 midnight. The object of this change was to eliminate the necessity for men working late straight runs to carry a supply of a.m. transfers to be used after midnight.

The New York & Queens County Railway is now operating a 100 per cent one-man service, and the adoption of this particular transfer was largely because it does not have to be punched after the car leaves the terminal.

Public Will Be Asked to Discuss Beeler Recommendations

It is planned by the Commission Council of New Orleans on the suggestion of Commissioner Maloney, of the Department of Public Utilities, to invite the public to a conference to be held in the Council Chamber on the 125 or more recommendations submitted in the Beeler report for the improvement of the New Orleans electric railway service.

The members of the Commission Council desire to hear from the public, in open discussions, on the recommendations, before taking definite steps toward adopting the recommendations in part or as a whole. The Commission Council has been prevented from taking this step sooner by reason of the absence of its members by illness or other-

wise, during the past two months. This delay has interfered with important paving projects and other works of civic improvement, that cannot be taken up until the electric railway matter is disposed of.

Jitney Lines in Houston Will Be Abolished July 1

In accordance with the instruction of the City Council of Houston for the submission of plans for the rerouting of jitneys the routes were presented to the Council on May 16.

After much discussion and very little progress in rerouting a motion was carried by a vote of three to one abolishing all jitney lines in the city effective July 1. This action by the Council was unexpected.

The jitney men wanted the Council to submit the question to a vote of the people, but it refused. However, the jitney men can force the matter to a vote by obtaining a referendum petition. Such a petition would only require approximately 2,000 signatures. No such petition is being circulated and the Houston Electric Company is now awaiting further developments.

The history of the jitney situation in Houston was reviewed in the ELECTRIC RAILWAY JOURNAL, issue of May 19.

Allows One-Man Car Operation.—The City Council will allow the Dubuque Electric Company, Dubuque, Ia., to operate one-man cars on one line for one year as an experiment. At present the company has in service a number of cars of the front-door type manned by two men, but designed for one-man operation.

Arrangements for Service Completed.—F. K. Woodring, general manager of the Northwestern Ohio Railway & Power Company, Oak Harbor, Ohio, reports that his company has completed arrangements by which interurban service from Marblehead and all points west of Toledo will be joined with the White Star Steamship Line for Detroit beginning June 1.

I. T. S. Opposes Bus Applicant.—The Illinois Traction System, Peoria, Ill., appeared before the Illinois Commerce Commission at Springfield on May 2 to oppose the issuance of a certificate of convenience and necessity to the Benld-Wilsonville Motor Bus Transportation Company to operate between Gillespie and Staunton via Benld and Sawyer-ville. The commission took the case under advisement.

Offices of Chicago Surface Lines Being Moved.—Most of the offices of the Chicago Surface Lines have now been moved from 105 South La Salle Street to 230 South Clark Street, occupying the eleventh and fourteenth floors of the new Illinois Merchants Bank Building. It is expected that the other half of this structure will be completed by May 1 next year, at which time the surface lines' offices, as well as the board of supervising engineers, will occupy the entire fourteenth floor.

Traffic Changes Suggested.—Recommendation is made by the Johnstown, Pa., City Planning Commission that cars on the Johnstown Traction Company cross street intersections before stopping, rather than continue the present practice of stopping on the near side of the streets. The committee makes the request to relieve traffic congestion. The committee's request is especially urgent as relates to intersections where the cars turn off from one avenue to another, the commission believing that cars should make the corner turn to take on or discharge passengers. The commission also asks for the discontinuance of parking cars at certain streets.

No Fare Reduction Likely in Worcester.—Clark V. Wood, president of the Worcester Consolidated Street Railway, Worcester, Mass., speaking in relation to suggestions of reduced fares, said recently that no early reduction from the present 10-cent rate was to be expected. He said that the company's receipts to date were slightly in excess of last year, but not large enough to create a surplus and that passenger receipts had of late been on the decline, owing to the highways again being freed from a snowbound condition.

Gratifying Response by Public to "L" Improvements.—Grayson M.-P. Murphy, chairman of the board of directors of the Interborough Rapid Transit Company, New York, N. Y., said on May 15 that recent improvements on the elevated and subway lines to increase efficiency had been more successful than the company hoped. He referred particularly to the success of the additional express service on the elevated lines, and said that it had already attracted more business than anticipated, and had somewhat relieved the congestion on the subway. With the summer coming, it is the belief this service will be even more attractive. Mr. Murphy also said that the first of the sliding door cars that will eventually mean the elimination of the swinging door type now used will be put in operation on the elevated division next fall.

Six-Cent Fare to Continue.—A 6-cent fare will continue to be charged by the Little Rock Railway & Electric Company, Little Rock, Ark., now the Arkansas Central Power Company, as a result of recent action of the City Council. The public utilities committee reported adversely on the ordinance by Alderman Connor, to reduce the fare from 6 cents to 5 cents, and recommended that the fare be continued at 6 cents. Accompanying the statement from the Councilmanic committee was the report of the engineers representing the city and the railway, the engineers having fixed a valuation of the company's properties at \$7,000,000 for rate-making purposes and saying that \$150,000 should be charged off annually for reproductions. The report provided that the company should dismiss within five days its appeal from the order of the Council of July 11, 1921, denying to it the right to collect a 7-cent fare.

Personal Items

E. G. Stevenson, President

Head of Detroit United Railway Has Rendered Invaluable Service to Company as Counselor—A. A. Gingras Treasurer

Elliott G. Stevenson, president and chief counsel of the Detroit United Railway, was born on a farm in Middlesex County, Ont., on May 18, 1856. In his early childhood his parents moved to Port Huron, Mich., and since that time he has resided in Michigan; in Port Huron until 1887 and in Detroit since 1887. His summers, however, have been for many years and are now spent on his large farm located on the Canadian shore of the Detroit River, near Amherstburg. He did not have the opportunity to obtain and never did obtain a college education. The best that his family—whose means were limited—could do for him was to send him through the public schools at Port Huron and to supplement this by a short course at an academy at London, Ont. This constituted his entire formal school education.

COUNSEL IN MANY FAMOUS CASES

In 1877 when he was only twenty-one years old, Mr. Stevenson was admitted to the bar, having acquired his legal knowledge by studying in the law office of O'Brien J. Atkinson, at Port Huron. In 1878, when he was only twenty-two years old, he was elected prosecuting attorney of St. Clair County, Michigan—the county in which Port Huron is located. In 1880 he was re-elected prosecuting attorney and held that office for another term of two years. He was Mayor of the city of Port Huron from 1885 to 1886. These were the only public offices he ever held or sought. He has stood for many years and stands now at the head of the Michigan bar. He is equally great as a trial lawyer, a wise adviser and a skillful and diplomatic negotiator.

Among the famous cases that he has successfully conducted may be mentioned the suit brought by the Dodge brothers against the Ford Motor Company and Henry Ford. In this suit Mr. Stevenson, as counsel for the Dodge brothers, obtained a decree compelling Mr. Ford, as owner of the majority of the stock of the Ford Motor Company, to distribute among the stockholders of that company \$25,000,000 of its earnings for the fiscal year ended July 31, 1916. In consequence of this decree, Mr. Ford, in order that he might carry out his plans, was compelled to buy the stock of the other stockholders, and to do this, he had to pay and did pay the sum of \$25,000 for each \$100 of stock purchased by him. A more famous suit, perhaps, than the one just mentioned was the action of Henry Ford against the Chicago *Tribune*, tried at Mount



E. G. Stevenson

Clemens, Mich., in 1919. Mr. Stevenson was the chief counsel for the *Tribune* company. This was a libel suit brought by Mr. Ford to recover damages because the *Tribune* had charged in a leading editorial that he was ignorant and was an anarchist. It will be remembered that in this suit, in examining Mr. Ford Mr. Stevenson asked questions which brought out from Mr. Ford the testimony that the American Revolution occurred in 1812 and that Benedict Arnold was a noted writer. In this case, Mr. Ford sought to recover \$1,000,000 damages. The jury gave him a verdict of 6 cents.

Only a small part of Mr. Stevenson's extensive legal business has resulted in court trials. His attitude has been that, as a general proposition, controversies instead of being litigated should be adjusted. In effecting such adjustments, he has displayed extraordinary wisdom and skill and thus rendered his clients a far greater and more valuable service than he would had these controversies been successfully litigated in suit.

For many years, Mr. Stevenson has been the leading counsel of the Detroit



A. A. Gingras

United Railway and during the last year he has also been its president. The complicated and disturbed condition of this company's affairs made the task of managing its legal and executive departments one worthy of the extraordinary qualities possessed by Mr. Stevenson. Ruin could not have been averted had the person entrusted with those responsibilities possessed smaller ability. His services to the company have been invaluable. To those services more than to any other cause the present improved condition of that company's affairs is to be attributed.

MONTREAL MAN IS TREASURER

A. A. Gingras, the treasurer of the Detroit United Railway, became a factor in the affairs of the company about the time the negotiations were coming to a head for the purchase of the city lines of the company by the city itself. There is a large Canadian interest in the Detroit United Railway and has been for some time, and Mr. Gingras is the accredited representative of this following in the company. His position does not call for him to be in the public eye to the extent that Mr. Stevenson's post does. Neither officer courts publicity, but Mr. Gingras because of his position has been able to escape public attention whereas Mr. Stevenson by the very reason of his position has not been able so to escape. The silence of Mr. Gingras has not been studied, but the effect on the public has been the same as if his silence had been one of design. He is a factor in financial affairs in Montreal, but his activities there, while large and varied, have not been such as to focus public attention upon him. This has made him an elusive subject for anything like a fitting biography. He represents his constituents fitly, but he does it unostentatiously, so that even in Detroit little is known about the man outside of immediate company circles. He spends only a part of his time in Detroit.

John W. Hulme and George W. Dunlap Resign from International Railway

H. L. Mack, vice-president in charge of engineering of the International Railway, Buffalo, announces a redesignation of positions in his department with a specialist to handle each phase of the engineering activities of the company. The three divisions are headed by a superintendent of power distribution, which consolidates the positions of superintendent of power and superintendent of lines; engineer in charge of maintenance of way, which absorbs the duties of chief engineer, and superintendent of equipment, which includes superintendent of buildings.

With the announcement of redesignation of positions and consolidation of departments under three division chiefs, who report direct to Mr. Mack, comes the announcement of the resignations of John W. Hulme as superintendent of equipment and George W. Dunlap as superintendent of power, and the pro-

motion of Henry E. Riexinger to the new position of engineer of maintenance of way. George Kuhn becomes superintendent of equipment and buildings and Joseph Mack becomes superintendent of power distribution.

Joseph Mack has been superintendent of power lines of the International Railway since 1910. Mr. Mack has been with the company for thirty years.

Mr. Riexinger has been chief engineer of the International Railway since 1910. He will continue to handle the duties of chief engineer in addition to his new position.

Mr. Kuhn has been associated with the mechanical department of the company for thirty-five years. For some time he has been superintendent of buildings, but for many years he has served as assistant superintendent of equipment.

R. G. Near and A. M. Farrell Assume New Duties

R. G. Near has been appointed acting general freight and passenger agent of the Chicago, Ottawa & Peoria Railway with offices at Joliet, Ill. In this capacity he succeeds A. M. Farrell, who resigned this position to assume similar duties with the Eastern Wisconsin Electric Railway at Oskosh, Wis.

Mr. Farrell has been connected with steam and electric railways for almost twenty-five years. In that time he served as chief of the traffic department of the Chicago, Ottawa & Peoria Railway. In his early days in the railway field he was associated with the Ohio River Railroad at Parkersburg, W. Va., as clerk to the general superintendent. He gave six years service to the Baltimore & Ohio Railroad, three years as chief rate clerk at the local freight office in Huntington, and three years as rate clerk of the division freight office in Parkersburg, W. Va. Mr. Farrell also served the Western Terminal Trunk Line Association and the Coal & Coke Railway in Elkins, W. Va. The position he just relinquished he had held for three years.

His successor, R. G. Near, spent one year in the transportation department of the Northern Pacific Railway, Duluth, Minn. Prior to that he had given two years in messenger service with the Adams Express Company in Aurora and three years as agent for the Adams Express Company in Duluth, Minn., and Ottawa, Ill. Later he went to the Chicago, Ottawa & Peoria Railway in Ottawa to work in the transportation department. He has been with this company nine years, two years in the transportation department, three years as agent and dispatcher and four years in the freight accounting department.

A. H. Kendall, master mechanic of Quebec district, Canadian Pacific Railway, has resigned to become manager of the Chicoutimi Pulp Company, the Saguenay Light & Power Company and the Roberval & Saguenay Railway Company, Chicoutimi, Quebec.

Mr. Maddock at Providence

Former Eastern Massachusetts Engineer
Made Assistant to Superintendent of
Equipment of Rhode Island Lines

R. S. Maddock has been appointed assistant to the superintendent of equipment of the United Electric Railways, Providence, R. I. On March 27, 1899, when he was fifteen years old, Mr. Maddock enlisted in the United States Navy as an apprentice. He served on several ships and stations in various capacities, including signal boy, gun-pointer and quartermaster, until March 25, 1905. He then entered the employ of the Boston Elevated as a pit helper at City Point, and after a few weeks in the pit-room was assigned part time to office and store room work. Meanwhile he attended an evening high school special course to prepare for the Lowell Institute courses at the Massachusetts Institute of Technology. During his second year at City Point Mr.



R. S. Maddock

Maddock started courses at the M. I. T., taking electrical engineering two years and mechanical engineering two years. He was graduated in 1910.

Meanwhile he had been transferred at his own request in 1907 from City Point to East Boston in order to get experience on heavy equipments and multiple-unit control, which at that time was comparatively new for surface cars. After serving for two years in East Boston Mr. Maddock went to work as inspector for the Boston & Northern Street Railway, now the Eastern Massachusetts, under E. W. Holst, who was then superintendent of equipment. His duties called for supervision of cars run from several stations over tracks of other companies. In addition he acted as foreman for short periods in different carhouses. Later he was sent to West Lynn as assistant foreman, thence to Woburn as foreman and thence to West Lynn as foreman in 1911. The following year he was made inspector of car repairs and continued to act in that capacity until August of that year, at which time he left railroad work.

Returning to the railway field in 1915 Mr. Maddock was re-employed as inspector of car repairs by the Bay State Street Railway, now the Eastern Massa-

chusetts. Since that time he has been assistant general foreman and shop foreman at the Chelsea shop, general foreman 1920 to June, 1922, and then equipment inspector. He continued to serve in the last-named capacity until March, 1923, at which time he resigned to enter the employ of the United Electric Railways.

Obituary

Dr. Hans Goldschmidt

Prof. Dr. Hans Goldschmidt, inventor of the widely known thermit process for welding iron and steel and for producing high grade metals and alloys, also originator of many other scientific inventions, died suddenly in Baden-Baden, Germany, on May 20 after a stroke.

Prof. Goldschmidt was born in Berlin on Jan. 18, 1861. After being graduated from the "gymnasium" of Altenburg, Hans Goldschmidt studied chemistry, physics and natural sciences in general at the universities of Berlin, Leipzig, Heidelberg, Strassburg and at the Institute of Technology at Charlottenburg. He received the degree of Ph.D. from the University of Heidelberg in 1886.

In 1887 Prof. Goldschmidt entered the firm of Th. Goldschmidt, Essen Ruhr, Germany, in joint partnership with his brother, Dr. Karl Goldschmidt. The attention of the latter was applied mainly to the business management of the company, while Prof. Hans Goldschmidt devoted himself to scientific research. Under their joint guidance the firm grew to international importance, with agencies and allied companies throughout the world.

Prof. Goldschmidt's most important invention was the thermit process, now used extensively all over the world for welding iron and steel sections and for producing metals and alloys of high purity.

Prof. Goldschmidt visited this country very frequently and was president of the Goldschmidt Thermit Company, now the Metal & Thermit Corporation, from 1904 to 1916. Through his death the world loses a chemist of great knowledge and inventive genius.

Henry Woodland

Henry Woodland, secretary and treasurer of the Allis-Chalmers Manufacturing Company, died suddenly at his home in Milwaukee on May 14.

Born in Utica, N. Y., Mr. Woodland at an early age became connected with the New York Air Brake Company, Chicago. Later he was treasurer of the Gates Iron Works, Chicago. When in 1901 this company was taken over in the consolidation which formed the Allis-Chalmers Company, he became assistant treasurer of the new organization and afterward its treasurer. In 1916 he was elected secretary and treasurer of the company.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Copper Buying Is Beginning Again

The Foreign Market is Uncertain, However, and Domestic Buying is Still Conservative—A Stable Price Is Likely

The present cheapness of copper in Europe appears to be due to the declining purchasing power of existing industries there, rather than to an actual abundance of the metal. The German government, which was a heavy buyer of American copper in 1919 and 1920, stopped work on many improvements at the time of the Ruhr occupation and at present has no money to carry them out. In Italy extension and repair work on telephone, telegraph and railway lines has been largely suspended awaiting the return of these industries to private operation. Copper is being bought in fair quantities in Great Britain, but in many of the smaller countries disturbed conditions have affected the market adversely.

The export of American copper is an enterprise entirely separate from the domestic market, being controlled by the Copper Export Association. Until the World War, about half of the copper sold in this country was for export. Owing to the elaborate organization of the metal trade in Europe, especially in Germany and England, and to the speculative foreign buying thus promoted, American sellers were not satisfied with the way their copper was being marketed abroad, and finally, at the close of the war, it was determined to correct some of the previous conditions. To that end, and partly to lift the burden of unsold stocks from American producers, the Copper Export Association was formed. This association, which will sell only to bona fide consumers, is temporarily out of the market.

Copper buying by domestic consumers has been conservative. Although manufacturers who use copper report a good quantity of orders on their books, deliveries have been held up in many cases by labor troubles, and they are therefore buying copper moderately. Over half the copper used in this country is used for electrical purposes, although in the last year or two, partly owing to the publicity campaigns of the Copper and Brass Research Association and private companies, and partly because of the comparatively low price of copper, that metal has been used in greatly increasing quantities for certain purposes to replace less durable materials.

Under present conditions, the prin-

cipal factors that make for a large copper demand are the development of electric power by public utility companies and railroads, enlargement of telephone facilities, and an expanding building industry. The proposed electrification of steam railroads all over the world will require immense quantities of copper.

Domestic buying is beginning in earnest and a gradual recovery in price to about 16 cents may be expected. It is unlikely, however, that consumers will compete with each other so strenuously to buy copper, that the price will be greatly advanced, as has happened before. A moderately stable price may be looked for.

SECONDARY COPPER

In the year 1921, with large amounts of scrap copper left over from the World War still available, a total of 217,300 tons of copper was recovered as secondary metal, which was equal to about 90 per cent of the virgin copper produced by United States mines. Copper appears in rejuvenated form to a much greater extent than do lead or zinc, and the amount of scrap copper available must be considered by all followers of the copper market.

General Business Depression Seems Improbable

Because of the recent slight slump in business in some fields, notably the construction field, the question has arisen as to whether this was the beginning of a general business depression. The best advised opinion in Washington is that the country is actually fortunate in having a little relief from the rapid ascent of the early months of the year, as this may give an opportunity to catch up slightly with orders and serve to stem the tide towards prices so high as to invite buyers' strikes. The country's business is considered to be passing an economic tableland and not going down grade.

The existing full employment, the absence of stocks of finished materials of almost every kind, and freedom from overproduction, certainly indicate stability. Furthermore, the unprecedented amount of money being distributed in wages represents a buying power that must surely have a tremendous influence in sustaining business. None of the elements of depression seems to be present in the existing situation.

The buying activities of the electric railway field specifically are, of course, very closely tied up with general business conditions. When there is full employment and plenty of money in circulation people ride, and when the opposite condition exists the riding

falls off materially. Heavy riding at the generally fair rate of fare now prevailing means good revenue for the railways and a correspondingly active buying, which may be expected to continue as long as there is little unemployment.

As to price levels, while present prices may be slightly inflated, it is out of the question that we can get back to the 1913 levels. The rate of taxation alone would preclude that. It has been the history of industry that the real factors in reducing price levels are the improvement of production methods and increasing efficiency of distribution. Labor will hold the major part of its gains.

Cement Situation Improves

The advice of government officials was sought a few weeks ago by the cement industry in the hope that duplication of orders for cement might be avoided. A survey indicated some twenty to thirty per cent of duplication in orders. This resulted from the fact that every cement mill in the country was booked to full production for many months ahead.

The recent curtailment of buildings, however, has introduced a considerable change in the situation. The Government was considering a curtailment of highway construction as a measure of relief for private industry, for it was thought in official circles that there are certain localities where road construction could well wait rather than to draw material away from needed use under private enterprise. As it has now turned out the reduction in demand for cement which has come from the curtailment of building construction has been tremendously greater than any curtailment in the use of this material which could have been brought about through the recommendation that construction work on public projects be retarded. While it is believed in Washington that even as things now are cement manufacturers would welcome a curtailment in the highway program, such curtailment does not now seem so essential, and there is some hesitancy to take such steps for fear the pendulum might swing back too far the other way.

Metal, Coal and Material Prices

| Metals—New York | | May 22 |
|--------------------------------------------------------------|---------|--------|
| Copper, electrolytic, cents per lb. | 15.437 | |
| Copper wire base, cents per lb. | 18.50 | |
| Lead, cents per lb. | 7.25 | |
| Zinc, cents per lb. | 6.875 | |
| Tin, Straits, cents per lb. | 42.125 | |
| Bituminous Coal, f.o.b. Mines | | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | \$6.875 | |
| Somerset mine run, Boston, net tons | 3.00 | |
| Pittsburgh mine run, Pittsburgh, net tons | 2.00 | |
| Franklin, Ill., screenings, Chicago, net tons | 1.825 | |
| Central, Ill., screenings, Chicago, net tons | 1.87 | |
| Kansas screenings, Kansas City, net tons | 2.625 | |
| Materials | | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | \$7.75 | |
| Weatherproof wire base, N. Y., cents per lb. | 19.25 | |
| Cement, Chicago net prices, without bags | \$2.20 | |
| Linseed oil (5-bbl. lots), N. Y., per gal. | \$1.14 | |
| White lead, in oil (100-lb. keg), N. Y., cents per lb. | 13.125 | |
| Turpentine, (bbl. lots), N. Y., per gal. | \$1.225 | |

Rolling Stock

United Railways & Electric Company, Baltimore, Md., will shortly place an order for two single-end Peter Witt type motor cars. This is for the purpose of experimenting with this type of equipment, looking toward the probable purchase of sixty or seventy cars of this type.

Dallas Railway has tentatively approved the proposal of the Supervisor of Public Utilities that the traction company purchase fifty new double-truck standard cars and put them in operation at once to relieve congestion, according to Richard Meriwether, vice-president and general manager. Orders have not been placed for the cars, but the proposal of the supervisor is being favorably entertained.

Birmingham Railway, Light & Power Company has placed orders for twenty new steel cars of the most improved design with the Cincinnati Car Company, according to an announcement on May 17, by J. S. Pevear, president and co-receiver of the company. The purchase, Mr. Pevear stated, will represent a total investment of approximately \$300,000. Separate entrances for white and negro passengers are to be provided on the new cars, with effectual separation of the races in the cars. These new cars, it is announced, will be rushed to completion as rapidly as possible and put into service. Cars now in use are being remodeled to meet the provisions of the recently adopted ordinance and settlement between the city and the company.

Track and Roadway

Ford City, Ont.—The Town Council has passed a by-law providing for an expenditure of \$83,218 as Ford City's share of the \$966,000 scheduled to be spent for electric railway service by the Hydro-Electric Power Commission of Ontario in 1923 in the border cities.

Southern Indiana Gas & Electric Company, Evansville, Ind., has completed work on the improvement of Main Street with 90-lb. rails. The work of laying a new stretch of track about 1 mile long on West Heights, a suburb, will start soon. The company's improvements in Evansville and suburbs this year will total about \$100,000.

Lewistown & Reedsville Electric Railway, Lewistown, Pa., will extend its lines from Fountain Square to Mount Rock at the Ort Valley Road. In making the extension the City Council designated that "T" rails be used, that the company remove the snow within twenty-four hours, that a 6-in. thickness of crushed limestone bed be used, that no turnouts be constructed and that lights be provided at the Logan Street extension by the company. The extension is more than 1 mile in length and connects with the traction company lines at Fountain Square. J. I. Quigley,

president of the trolley company, plans to begin work immediately.

New York, N. Y.—The New York Transit Commission has awarded to McClintic-Marshall Company, 50 Church Street, the contract for construction of Section 1 of the Flushing subway extension. This company's bid was \$679,838, the lowest figure named by eight bidders. This bid, however, is \$63,958 greater than that of the Phoenix Bridge Company, to which the contract was originally awarded, but rejected by the Board of Estimate.

Power Houses, Shops and Buildings

Cleveland Railway is building a new storage yard on East Thirty-fourth Street, at which it will store the cars of its rapid transit line and also some other cars, including some tripper cars. This yard will be equipped with an operating inspection shop and other facilities.

Hartford & Springfield Street Railway, Warehouse Point, Conn., through Attorney Harrison B. Freeman, receiver, has petitioned the Superior Court for authority to discontinue the power station at Warehouse Point and purchase energy from the Northern Connecticut Light & Power Company. In supporting his petition at a recent hearing, he explained that the power station was twenty years old and that a saving of \$15,000 or more each year could be effected through a contract with the Northern Connecticut.

Dubuque Electric Company through its officials stated that a series of improvements and additions at the power plant, which was started about three years ago, will be carried on for about eighteen months. The program now under way will change the arrangement of the plans about so that the water pumping equipment will be capable of supplying a sufficient supply of water to the boilers, regardless of variations in the river stage. The officials stated that recent improvements would amount to about \$300,000. The improvements contemplated will amount to about another \$100,000, it was announced. Plans are being considered for breaking ground for a new turbine room within the next ten months. It will be located on the ground near the present power plant.

Trade Notes

Rollway Bearing Company, Inc., Syracuse, N. Y., is the new name of the Railway Roller Bearing Company. This change was effected because of the fact that the trade name "Rollway" under which the company's bearings have been advertised and marketed for the past fourteen years is more generally identified with the company's product than the old name. To care for the increase in the volume of business the company has reorganized.

F. V. Shannon has been appointed western manager of the Massey Concrete Products Corporation in charge of the territory comprising the states of California, Oregon, Washington, Idaho, Nevada, Arizona, Utah, Wyoming and Montana, with offices at 65 Market Street, San Francisco.

Westinghouse Electric & Manufacturing Company announced that it has more than \$4,000,000 of orders for the Pennsylvania, Long Island, Southern Pacific, Norfolk & Western and New Haven Railroads. It will build three large electric locomotives for the Pennsylvania, and an additional power house and generating equipment at Long Island City, equipment for forty motor cars for the Long Island, four large electric locomotives for the Norfolk & Western and a transformer station, twelve passenger locomotives for the New Haven and a new generating unit at Cos Cob, Conn., and two large electric locomotives for the Southern Pacific in addition to equipment for eight other locomotives.

New Incorporator

Houston, Beaumont & Orange Interurban Railway, Houston, Tex., has been incorporated with a capital stock of \$450,000. The purpose of the company is to construct an interurban electric railway between Houston and Orange, a distance of about 100 miles. Among the incorporators are: Edward Kennedy and W. V. Kennedy, Houston.

New Advertising Literature

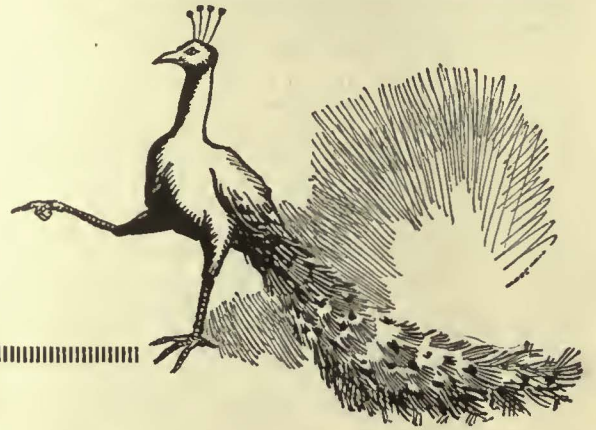
Manganese Steel Forge Company, Philadelphia, Pa., has issued two new Rol-Man welding rod folders, one for trackwork and the other for mills, mines, furnaces, smelters, etc.

Conveyors Corporation of America, Chicago, Ill., has issued an illustrated booklet showing the construction and application of the American steam ash conveyor which it builds. This concern was formerly the American Steam Conveyor Corporation.

Rome Wire Company, Rome, N. Y., has just issued a new price list on its Super-Service cords and cables. Attractive in form, the list is 3½ in. x 6 in. in size and is printed in three colors. It has had a wide circulation among the jobbers and dealers, and copies will be sent to anyone interested.

Driver-Harris Company, Harrison, N. J., has issued "Data Book R 23 on Alloys for Electrical Resistance." Tables are given showing in detail physical and cost data for Nichrome wires and ribbons, as well as wires and ribbons of other alloys produced by this company. As the name indicates, Nichrome is a nickel-chromium alloy. It is made in several compositions, each particularly adapted to some high temperature uses. This book also contains tables of data, particularly conversion tables.

*Are you ordering
any new safeties
this year?*



Overcome the usual objections
by equipping one-man cars with

PEACOCK Staffless Brakes

Don't let prejudiced parties stand between your company and the economies you can gain with one-man safety cars. Prove to the public and to your own men that "safety cars" can be made "safe."

Complete safety equipment includes the Peacock Staffless Brake—the hand brake which is specifically designed and built to solve the braking problems of the light-weight Birney type car.

Install Peacock Staffless Brakes. Then take the critics out and give them a practical demonstration on the road, of what you can do with a *properly equipped* safety car. Peacock Staffless Brakes will stop the car when the air brake is entirely cut out. Incorporate Peacock equipment in your original design.

National Brake Company, Inc.

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Canadian Representative:
Lyman Tube & Supply Company, Limited
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Bankers and Engineers

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Incorporated

Business Established 1894

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THE J. G. WHITE ENGINEERING CORPORATION

Engineers—Constructors

Industrial Plants, Buildings, Steam Power Plants, Water
Powers, Gas Plants, Steam and Electric Railroads,
Transmission Systems

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STONE & WEBSTER

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SCHEDULES—CONSTRUCTION—VALUATIONS
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REPORTS, DESIGNS, CONSTRUCTION, MANAGEMENT
HYDRO-ELECTRIC DEVELOPMENTS

RAILWAY, LIGHT and POWER PROPERTIES

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ENGELHARDT W. HOLST

Consulting Engineer

Appraisals, Reports, Rates, Service Investigation,
Studies on Financial and Physical Rehabilitation
Reorganization, Operation, Management

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ENGINEERS—CONSTRUCTORS
ELECTRICAL—CIVIL—MECHANICAL

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Engineer—921 Fifteenth St., WASHINGTON, D. C.

TRANSPORTATION

Complete Transit Surveys and Development Programs,
adapting Motor-Transport, R.R. Terminal and
City Plans. Traffic, Service, Routing, Operation and
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ELECTRIC RAILWAY ENGINEER

WORCESTER, MASSACHUSETTS

REPORTS—APPRAISALS—RATES—OPERATION—SERVICE

JOE R. ONG

Consulting Transportation Engineer

*Specializing in Traffic Problems and in Methods to
Improve Service and Increase
Efficiency of Operation*

PIQUA, OHIO

Dwight P. Robinson & Company

Incorporated

Design and Construction of

Electric Railways, Shops, Power Stations

125 East 46th Street, New York

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43 Cedar Street, New York City

DAY & ZIMMERMANN, INC.

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*Design, Construction
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NEW YORK PHILADELPHIA CHICAGO

WALTER JACKSON

Consultant on Fares, Buses, Motor Trucks

Originator of unlimited ride, transferable weekly
pass. Campaigns handled to make it a success.

143 Crary Ave., Mt. Vernon, N. Y.

JAMES E. ALLISON & CO.

Consulting Engineers

Specializing in Utility Rate Cases and
Reports to Bankers and Investors

1017 Olive St., St. Louis, Mo.

The Baker Wood Preserving Company CREOSOTERS

Washington Court House, Ohio

Cross Ties Bridge Timbers
Lumber Posts

Piling

Treated and Untreated

We solicit your inquiries

Creosoting Plant located
Washington Court House, Ohio
On—Penna. R.R., B. & O. R.R., D. T. & I. R.R.
Operating Mills in Southern Ohio



Examine this

Electric Railway Library

for 10 days free

Here are the four best practical books on electric railway work—giving modern, reliable information derived from the actual experience of practical electric railway specialists. These books point out methods that have proved successful in increasing efficiency and in lowering costs. Apply these sound suggestions and advice to your every-day problems.



Sent on approval

Small monthly payments

The Most Successful Men in the Electric Railway Industry read the

ELECTRIC RAILWAY JOURNAL

Every Week

Transmission Line and Special Crossing Structures, Catenary Bridges

WRITE FOR OUR NEW DESCRIPTIVE CATALOG

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Management and Financing of Utilities and Industrials

Youngstown New York

THE P. EDWARD WISH SERVICE

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NEW YORK DETECTIVES BOSTON

FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc.,
370 Seventh Avenue, New York.

You may send me the Electric Railway Library for my inspection. If the books prove satisfactory I will send \$3.00 in 10 days and \$3.50 per month for four months—until I have paid the price of the books—\$16.00. If the books are not what I want I agree to return them postpaid within 10 days of receipt.

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Signed

Address

Name of Company

Official Position

(Books sent on approval to retail purchasers in the U. S. and Canada.)
E 5-20-23

When writing the advertiser for information or price, a mention of the Electric Railway Journal would be appreciated.

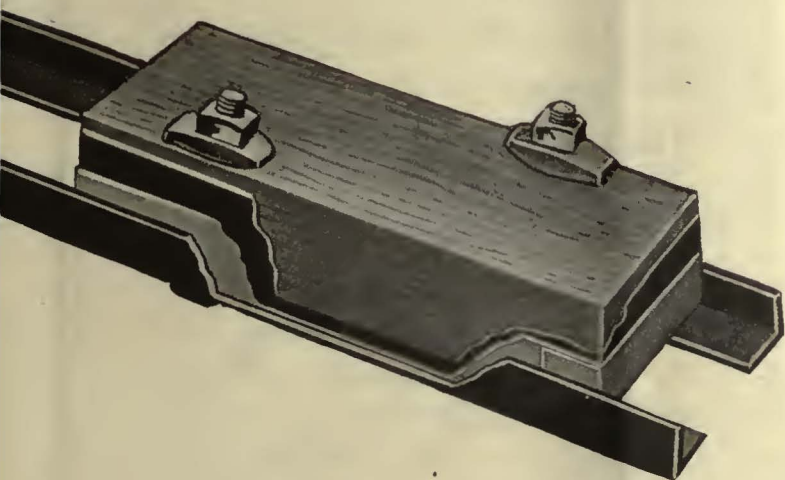


DAYTON

They did not believe they could save \$6,000 per mile

—but experience proved that our claim is based on fact

The first cost of track laid on Dayton Resilient Ties is \$6,000 per mile cheaper than that laid on wood ties on concrete foundation and \$2,000 per mile cheaper than that laid on wood ties on gravel ballast.



*Write today
for actual cost figures
on Resilient Tie Track Construction*

RESILIENT TIES will enable you to build *more track* and *better track* for the same money—or the same amount of track for far *less* money.

Consider the saving of \$6,000 per mile in concrete roadbed. Considerable. Yet there are reliable figures from Resilient Tie jobs in many parts of the country which supply evidence that this saving has actually been accomplished time and again.

But the mere fact that Resilient Tie jobs *cost less* is not enough. You may also have absolute assurance that Resilient Ties actually provide *better track* than wood ties. Accurate statistics show that not only is maintenance cost greatly reduced, but that the *resiliency* of these modern ties effects a considerable saving in repairs on rolling stock—with less jarring there is less wear, and less wear means longer-lived cars and reduced costs.

THE DAYTON MECHANICAL TIE CO.

706 Commercial Building, Dayton, Ohio

Canadian Representative:

Lyman Tube and Supply Co., Ltd., Montreal, Quebec

Resilient TIE

- saves first cost !
- saves maintenance !
- saves rolling stock !

How to Insure Sales for Your Product!

The chief asset of any business is the demand for its product. As long as that demand continues, the business is on a sure foundation. But let that demand subside, and every other asset of the business is in danger of becoming a liability.

IN times of prosperity and a rising market there is a general demand for the products of industry that comes to be accepted as a matter of course. It is seldom listed among the assets of the business—it is simply assumed that it will always be there.

But, overnight, conditions may change—as they have done before—and the matter-of-course demand becomes conspicuous by its absence. The business, once strong and flourishing, is suddenly found to be in a very tight place. *The demand had not been insured*—and

yet the entire business depended upon its *continuance*.

The modern, economical way to insure the market for any reliable product is by Advertising to the public which consumes it. Advertising creates a steadily increasing number of customers who desire the product, and ask for it by name.

During the present business condition the manufacturers who have insured their demand by Advertising are in a far better position—in every way—than those who have trusted to the current demand that was not of their creating.



"ATLAS"

"UNIVERSAL"

"RECIPROCATING"

Equipment for Economical Improvement of Track

ATLAS Rail Grinder

An inexpensive rotary grinder especially suited for following up the welders, and removing surplus metal. Light, fast and efficient, simple to operate and satisfactory in its work. Rubber-tired derail wheels permit easy moving.

UNIVERSAL Rotary Track Grinder

Because of its tilting grinding wheel feature it can reach any part of the work, and grind at any angle on the rail head, thus affording accurate finishing to conform to shape of rail.

RECIPROCATING Track Grinder

Recommended by way engineers and roadmasters of leading electric railways as the most satisfactory machine for removing corrugations. So simple mechanically, and so ruggedly constructed that common labor can be employed to operate it.

AJAX Electric Arc Welder

Highest capacity welder of its type on the market. Furnishes high ampere output even under lowest trolley voltage conditions. A light-weight, simple, easily handled apparatus which will positively afford deep, lasting, satisfactory welds. Arranged for exceptionally thorough ventilation while in operation.

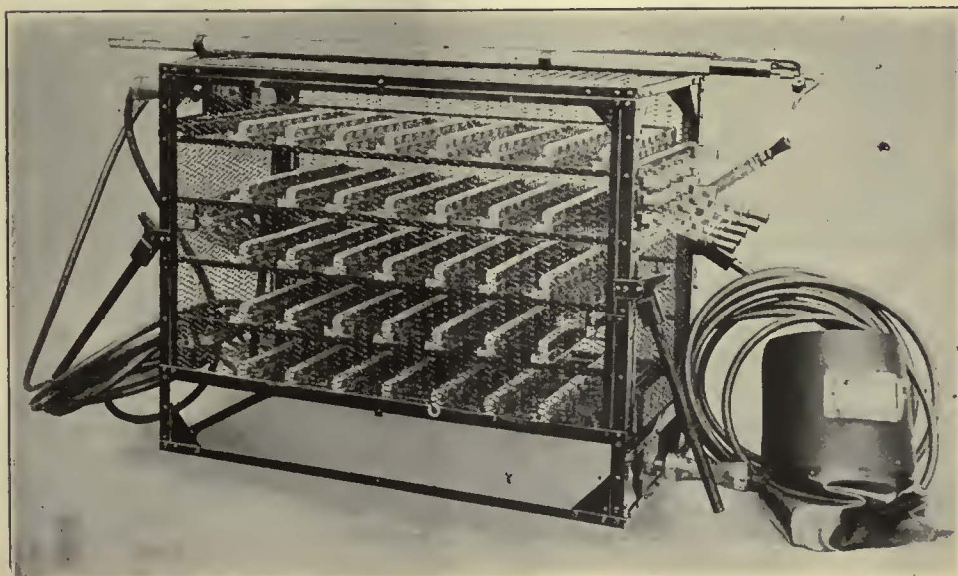
RAILWAY TRACK-WORK COMPANY

3132-48 E. Thompson St., Philadelphia, Pa.

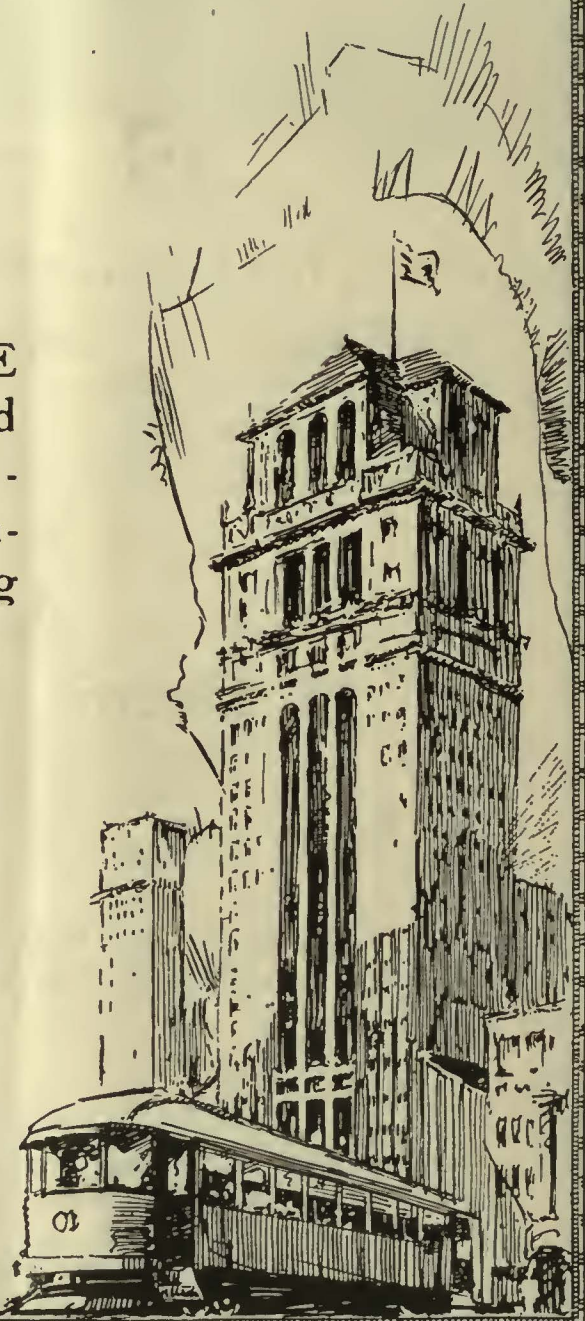
30 Church St., New York, N. Y.

AGENTS:

Chas. N. Wood Co., Boston Atlas Railway Supply Co., Chicago
 Electrical Engineering & Mfg. Co., Pittsburgh P. W. Wood, New Orleans
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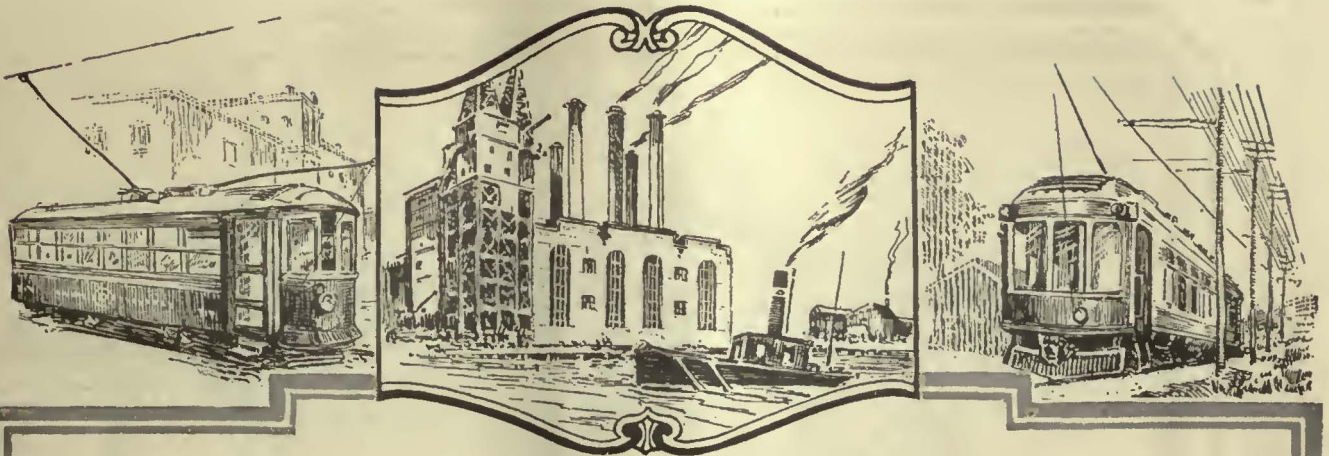
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CANDLER BUILDING, THE HOME OF COLLIER SERVICE



CANDLER BLDG NEW YORK



We've heard of *One* man who *doesn't* like "CRATER"

He's a junk man. And his grievance is over the fact that for many years part of his booty consisted of a lot of worn gears and pinions. He doesn't get so many and he feels the loss.

He mourns alone, for the Electric Street Railways are rejoicing in the use of Texaco Crater Compound. For wherever Texaco Crater Compound is used gears and pinions last longer—much longer, which means that gears and pinions stay on the shafts instead of going to the "pile."

And thus a host of savings is rolled up for the Company.

Of course the first and most obvious saving is on the cost of new gears and pinions, due to the increased life of "Crater-lubricated" sets. Then there is the important item of labor for renewals.

Because of the method we have perfected

Direct Application of Texaco Crater Compound

large quantities of lubricant are saved in regular operation.

Here's how it works:

A small quantity of Texaco Crater Compound is put directly onto the uppermost gear teeth.

A few revolutions and all the teeth of all the gears and pinions are coated with a protective film of Texaco Crater Compound.

This film is enough for perfect lubrication.

It checks wear.

It doesn't hold chips or dirt.

It doesn't fling around the casing.

It stays on the job—on the teeth—for a long time.

When the car is inspected, your men notice the condition of the gears and, if required, they add a little lubricant.

This method has proven itself the most effective and economical.

And you don't waste lubricants—yet you save gears.

And with perfect lubrication, power consumption is proportionately low.

Records drawn from millions of car miles prove value of Texaco Crater Compound—yet if you want to see how it meets the conditions peculiar to the operation of your line, let's hear from you and we'll be glad of the chance to bring home to you a simple method of making many important savings.

There is a Texaco Lubricant for every purpose—
Rolling Stock, Power Plant, Substation everywhere.



THE TEXAS COMPANY
DEPT. R-J · 17 BATTERY PLACE · NEW YORK CITY
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OFFICES IN PRINCIPAL CITIES





The
COLUMBIA
Armature
Coil
Taping
Machine

The Columbia Armature Coil Taping Machine saves time and labor wherever it is used. It pulls the tape much tighter than could be done by hand and it does the work many times more quickly.

The machine is self-contained, having a friction clutch and an automatic brake which instantly stops it at any point of revolution when the operator removes his foot from the treadle.

The Taping Machine is furnished in iron, bronze or steel with a hardwood work table 24 in. x 36 in.

We will be glad to furnish further information at your request.



3313 Atlantic Ave., Brooklyn,

N. Y.



Cars built by the Differential Steel Company for the Beech Bottom Power Company. The Standard Steel Works Company produced the wheels and axles.

"Not only to make better products but to make them better understood—not only to sell but to serve, assisting those who buy to choose as well as use their purchases—this is the privilege if not the practice of all modern manufacturers."

—Vauclain



STANDARD STEEL WORKS COMPANY

PHILADELPHIA, PA.

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BALDWIN



Terminal Station of the Osaka Electric Railway, Japan.

Baldwin Electric Motor Trucks Noted for their Simplicity, Economy and Low Cost of Maintenance

ON a number of the electric railways in Japan, Baldwin motor trucks are standard.

Whether used in heavy high-speed electric railway service, city, or interurban electric railway cars, on cars with long or short wheel-bases, Baldwin trucks may be rapidly repaired in company shops as commercial shapes are largely used in their construction.

Baldwin trucks are built as light as is consistent with strength and are designed to give perfect riding qualities. Full details regarding all types of trucks forwarded upon request.

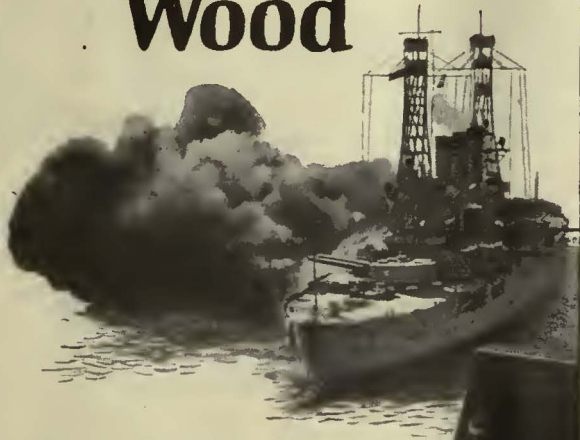
THE BALDWIN LOCOMOTIVE WORKS
 PHILADELPHIA, U. S. A. Cable Address, "Baldwin, Philadelphia"

One of the cars on the Osaka Electric Railway—Osaka to Nara—equipped with Baldwin Trucks.



MOTOR TRUCKS

Ebony Asbestos Wood



Where switchboards must stand physical shock!

THE shock of broadside firing literally causes a battleship to jump sidewise—a racking strain on its equipment.

Ordinary switchboard materials might crack under this strain—Ebony Asbestos Wood has the strength to stand it. For this reason, Ebony Asbestos Wood is largely used for modern battleship switchboards.

This strength might be unimportant if it meant a sacrifice in reliability. Fortunately, Ebony Asbestos Wood is not only stronger than ordinary switchboard materials, but has better electrical characteristics, and is lighter, free from flaws, better looking, and more easily worked.

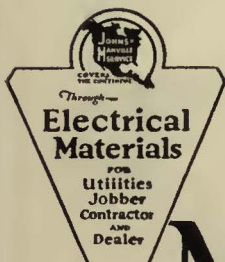
In every phase of electrical work, Ebony Asbestos Wood is giving a far greater protection to the apparatus it mounts.

JOHNS-MANVILLE Inc.
Madison Ave. at 41st St., N. Y. C.
Branches in 56 Large Cities

For Canada:
CANADIAN JOHNS-MANVILLE
CO., Ltd.,
Toronto

On battleships, in central stations, and wherever switchboard failure would entail heavy losses, Ebony Asbestos Wood is the preferred mounting material.

JOHNS-MANVILLE



Umlambo

Before a Kaffir drinks from a pool he carefully peers into its clear depths to see if *umlambo* is lying in wait for him.

Umlambo being the evil spirit that snatches unwary drinkers, hauls them down and changes them into fish.

It's a commendable practice to *look* into things before you *get* into them.

Of course you can't look into a carbon brush, because it's too dense—therefore greater chance for *Umlambo* to hide.

But you can get a look in on proper brush practice through engineering prescription.

That's the only way Morganite brushes are sold.

They enable you to drink deep of good commutation.



Main Office and Factory:
519 West 38th Street, New York

DISTRICT ENGINEERS AND AGENTS:

Electric Power Equipment Corp.,
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Electrical Engineering & Mfg. Co.,
909 Penn. Ave., Pittsburgh

J. F. Drummey, 75 Pleasant St.,
Revere, Massachusetts

W. R. Hendey Co., Hoge Bldg.,
Seattle

Herzog Electric & Engineering Co.,
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Special Service Sales Company,
202 Russ Bldg., San Francisco, Calif.

Railway & Power Engineering Corporation, Ltd.,
131 Eastern Ave., Toronto, Ontario, Canada





Use
Bates Steel Poles

With your other first-class equipment and the whole installation will be permanent and an inducement for your security buyers.

Bates Steel Poles are being used in rapidly increasing numbers in all types of modern construction all over the world. With their distinct advantages of strength, permanence, economy, and their wide range of adaptability, Bates Poles have met the exacting demands of pole users who are recognized as leaders in the electrical industry.

Bates **E**xpanded **S**teel **T**russ **C**o.

Illinois Merchants Bank Bldg., Chicago, Ill.

There's a Bates Pole for every Pole purpose.

BATES ONE PIECE EXPANDED STEEL POLES

**Examine this book
for 10 days
FREE**



Richey's
Electric Railway Handbook

832 pages, flexible. 4 x 7, over 600 illustrations. \$4.00 net, postpaid.

A pocket encyclopaedia of practical information on electric railway work. This book contains the data, formulae and tables that are constantly required by the operating, construct-

ing or designing engineer. It is a book which may be used by the non-technical manager as well as the engineer.

The first step to bigger pay—

- I. Roadbed and Track.
- II. Buildings.
- III. Train Movements.
- IV. Railway Motors.
- V. Controlling Apparatus.
- VI. Current Collecting Devices.
- VII. Trucks.
- VIII. Braking.
- IX. Rolling Stock.
- X. Transmission and Distribution.
- XI. Signals and Communication.

Free Examination Coupon

McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York, N. Y.

You may send me on 10 days' approval Electric Railway Handbook, \$4.00 net. I agree to pay for the book or return it postpaid within 10 days of receipt.

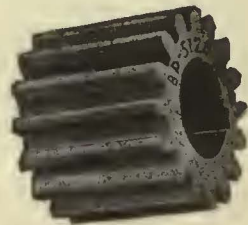
Regular subscriber to the Electric Railway Journal?.....
Member of A. I. E. E. or A. E. R. A.?.....
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Official position
Name of company.....
(Books sent on approval to retail purchasers in the U. S. and Canada only.) F.E.

Nuttall



Nuttall Pinions are nearly equal in transverse strength and longitudinal strength, due to special processes of forging. This adds immeasurably to their service life and is a feature of great economy to you.

Nothing is omitted, regardless of cost, that will make Nuttall pinions better—special selection of material, accurate machining and grinding, scientific heat treatment, critical inspection. You couldn't get any better value for ten times their cost.



R.D. NUTTALL COMPANY
PITTSBURGH  PENNSYLVANIA

All Westinghouse Electric and Mfg. Co. District Offices are Sales Representatives in the United States for Nuttall Electric Railway and Mine Haulage Products.

In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.



Qualified—

Qualified—by experience, size and established reputation to render "quality service" to electric railway companies.

Send for circulars.

St. Louis Car Company
St. Louis, Mo.

"The Birthplace of the Safety Car"

"Quality" Cars

- City Cars
- Interurbans
- Safety Cars
- Motor Buses
- Trolley Buses

"Quality" Equipment

- Trucks
- Forgings
- Castings
- Seats
- Rattan
- Metal Trim
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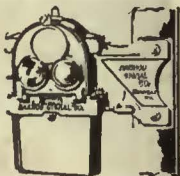
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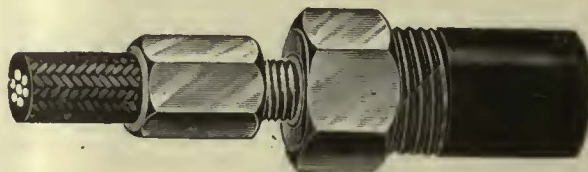
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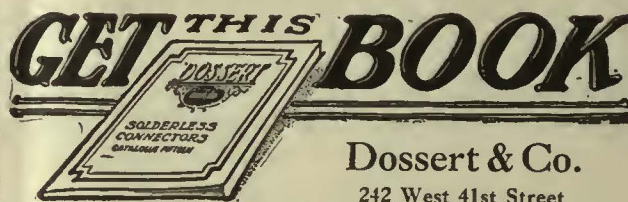
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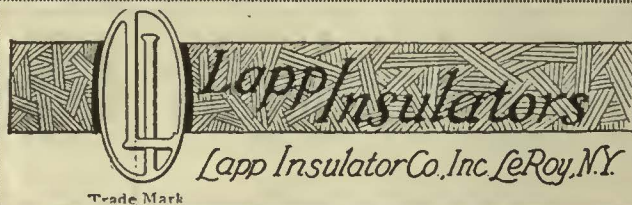
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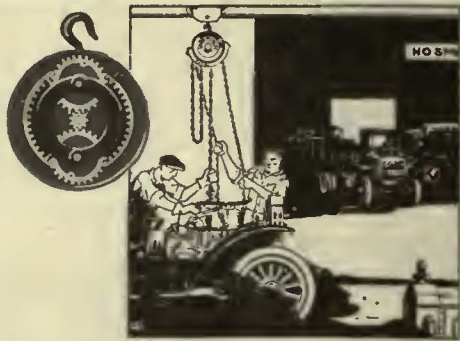
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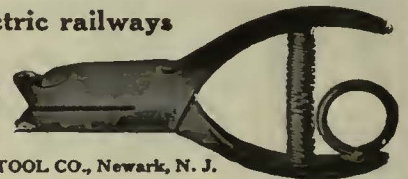
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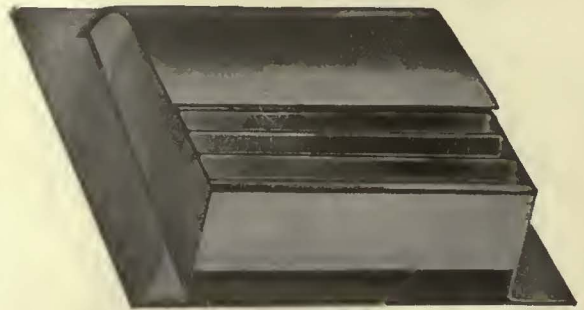
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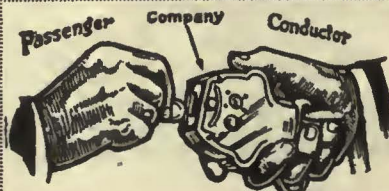
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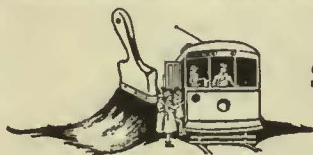


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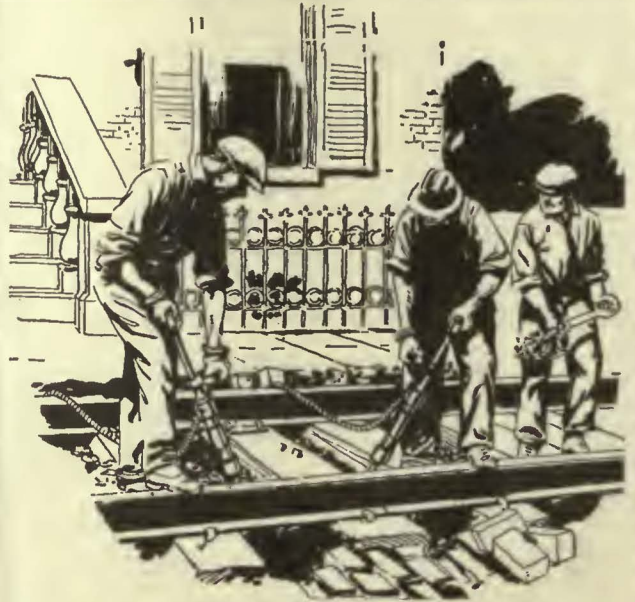
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- Roofing, Cur**
Pantastote Co., The
Sunders, Track
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.
Nichols-Lintern Co.
Ohio Brass Co.
- Sash Fixtures, Car**
Brill Co., The J. G.
- Sash, Metal, Car Window**
Hale & Kilburn
- Scrapers, Track (See Cleaners and Scrapers, Track)**
- Screw Drivers, Rubber Insulated**
Electric Service Sup. Co.
- Seating Materials**
Brill Co., The J. G.
Pantastote Co., The
Seats, Bus
St. Louis Car Co.
- Seats, Car (See also Rattan)**
Amer. Rattan & Reed Mfg. Co.
Brill Co., The J. G.
Hale & Kilburn
Heywood-Wakefield Co.
St. Louis Car Co.
- Second Hand Equipment**
Electric Equipment Co.
- Shades, Vestibule**
Brill Co., The J. G.
- Shovels**
Allis-Chalmers Mfg. Co.
Brill Co., The J. G.
Hubbard & Co.
- Side Bearings (See Bearings, Center and Slide)**
- Signals, Car Starting**
Con. Car Heating Co.
Electric Service Sup. Co.
Nat'l Pneumatic Co., Inc.
- Signals, Indicating**
Nichols-Lintern Co.
- Signal Systems, Block**
Electric Service Sup. Co.
Nachod Signal Co., Inc.
U. S. Electric Signal Co.
Wood Co., Chas. N.
- Signal Systems, Highway Crossing**
Nachod Signal Co., Inc.
U. S. Electric Signal Co.
- Slack Adjusters**
(See Brake Adjusters)
- Slag**
Carnegie Steel Co.
- Steel Wheels and Cutters**
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Electric Ry. Equip. Co.
Electric Service Sup. Co.
Nuttall Co., R. D.
- Smokestacks, Car**
Nichols-Lintern Co.
- Snow-Plows, Sweepers and Brooms**
Amer. Rattan & Reed Mfg. Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Consolidated Car Fender Co.
- Sockets & Receptacles**
Johns-Manville, Inc.
- Special Adhesive Papers**
Irvington Varnish & Ins. Co.
- Special Track-Work**
Lorsin Steel Co.
- Spikes**
Amer. Steel & Wire Co.
Splicing Compound
Westinghouse E. & M. Co.
Splicing Sleeves (See Clamps and Connectors)
- Springs, Car and Truck**
Amer. Steel & Wire Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Standard Steel Works Co.
St. Louis Car Co.
- Sprinklers, Track and Road**
Brill Co., The J. G.
- Steel Castings**
Wharton, Jr., & Co., Wm.
- Steels and Steel Products**
Morton Mfg. Co.
- Steps, Car**
Morton Mfg. Co.
- Stokers, Mechanical**
Babcock & Wilcox Co.
Westinghouse E. & M. Co.
- Storage Batteries (See Batteries, Storage)**
- Strain Insulators**
Ohio Brass Co.
- Strand**
Roebing's Sons Co., J. A.
Sunderbatters
Babcock & Wilcox Co.
Power Specialty Co.
Sweepers, Snow (See Snow Plows, Sweepers and Brooms)
- Switchboxes**
Johns-Manville, Inc.
Switch Stands and Fixtures
Ramapo Ajax Corp.
- Switches, Selector**
Nichols-Lintern Co.
- Switches, Track (See Track, Special Work)**
- Switches and Switchboards**
Allis-Chalmers Mfg. Co.
Anderson Mfg. Co., A. & J. M.
Electric Service Sup. Co.
General Electric Co.
Westinghouse E. & M. Co.
- Switches, Tee Rail**
Ramapo Ajax Corp.
- Tampers, Tie**
Ingersoll-Rand Co.
- Railway Track-Work Co.**
Tapes and Cloths (See Insulating Cloth, Paper and Tape)
- Tee Rail Special Track Work**
Ramapo Ajax Corp.
- Telephones and Pans**
Electric Service Sup. Co.
- Terminals, Cable**
Standard Underground Cable Co.
- Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)**
- Thermostats**
Con. Car Heating Co.
Gold Car Heating & Lighting Co.
- Railway Utility Co.**
Smith Heater Co., Peter
Ticket Choppers and Destroyers
Electric Service Sup. Co.
- Ties and Tie Rods, Steel**
Barbour-Stockwell Co.
Carnegie Steel Co.
International Steel Tie Co.
- Ties, Mechanical**
Dayton Mechanical Tie Co.
- Ties, Wood Cross (See Poles, Ties, etc.)**
- Tongue Switches**
Wharton, Jr., & Co., Wm.
- Tool Steel**
Carnegie Steel Co.
- Tools, Track and Miscellaneous**
Amer. Steel & Wire Co.
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.
Hubbard & Co.
Railway Track-Work Co.
- Towers and Transmission Structures**
Bates Exp. Steel Truss Co.
Westinghouse E. & M. Co.
- Track Expansion Joints**
Wharton, Jr., & Co., Wm.
- Track Grinders**
Metal & Thermit Co.
Railway Track-Work Co.
- Trackless Trolleys**
St. Louis Car Co.
- Track, Special Work**
Barbour-Stockwell Co.
Buda Co.
New York Switch & Crossing Co.
Wharton, Jr., & Co., Wm., Inc.
- Transformers**
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.
- Treads, Safety, Stair Car Step**
Morton Mfg. Co.
- Trolley Bases**
Anderson Mfg. Co., A. & J. M.
Electric Service Sup. Co.
General Electric Co.
Nuttall Co., R. D.
Ohio Brass Co.
- Trolley Bases, Retrieving**
Ackley Brake & Supply Corp.
Anderson Mfg. Co., A. & J. M.
Electric Service Sup. Co.
General Electric Co.
Ohio Brass Co.
- Trolley Buses**
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.
- Trolley Materials, Overhead**
Ohio Brass Co.
- Trolley Shoes**
Economy Elec. Devices Co.
- Trolley and Trolley Systems**
Ford-Chain Block Co.
- Trolley Wheels and Hubs**
Thornton Trolley Wheel Co.
- Trolley Wheels, (See Wheels, Trolley Wheel Bushings)**
- Trolley Wire**
Amer. Electrical Works
Amer. Steel & Wire Co.
Anaconda Copper Min. Co.
Bridgeport Brass Co.
Roebing's Sons Co., J. A.
Rome Wire Co.
- Trucks, Car**
Baldwin Locomotive Works
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.
- Tuning, Yellow and Black Flexible Varnishes**
Irvington Varnish & Ins. Co.
- Turbines, Steam**
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.
- Turbines, Water**
Allis-Chalmers Mfg. Co.
- Turbostrles**
Electric Service Sup. Co.
Ohio Brass Co.
Perey Mfg. Co.
- Upholstery Material**
Amer. Rattan & Reed Mfg. Co.
- Valves**
Westinghouse Tr. Br. Co.
- Vacuum Impregnation**
Allis-Chalmers Mfg. Co.
- Varnished Papers**
Irvington Varnish & Ins. Co.
- Varnished Silks**
Irvington Varnish & Ins. Co.
- Ventilators, Car**
Brill Co., The J. G.
National Ry. Appliance Co.
Nichols-Lintern Co.
Railway Utility
- Welders, Portable Electric**
Electric Railway Improvement Co.
Ohio Brass Co.
Rail Welding & Bonding Co.
Railway Track-work Co.
- Welding Processes and Apparatus**
Alumino-Thermic Corp.
Electric Railway Improvement Co.
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Rail Welding & Bonding Co.
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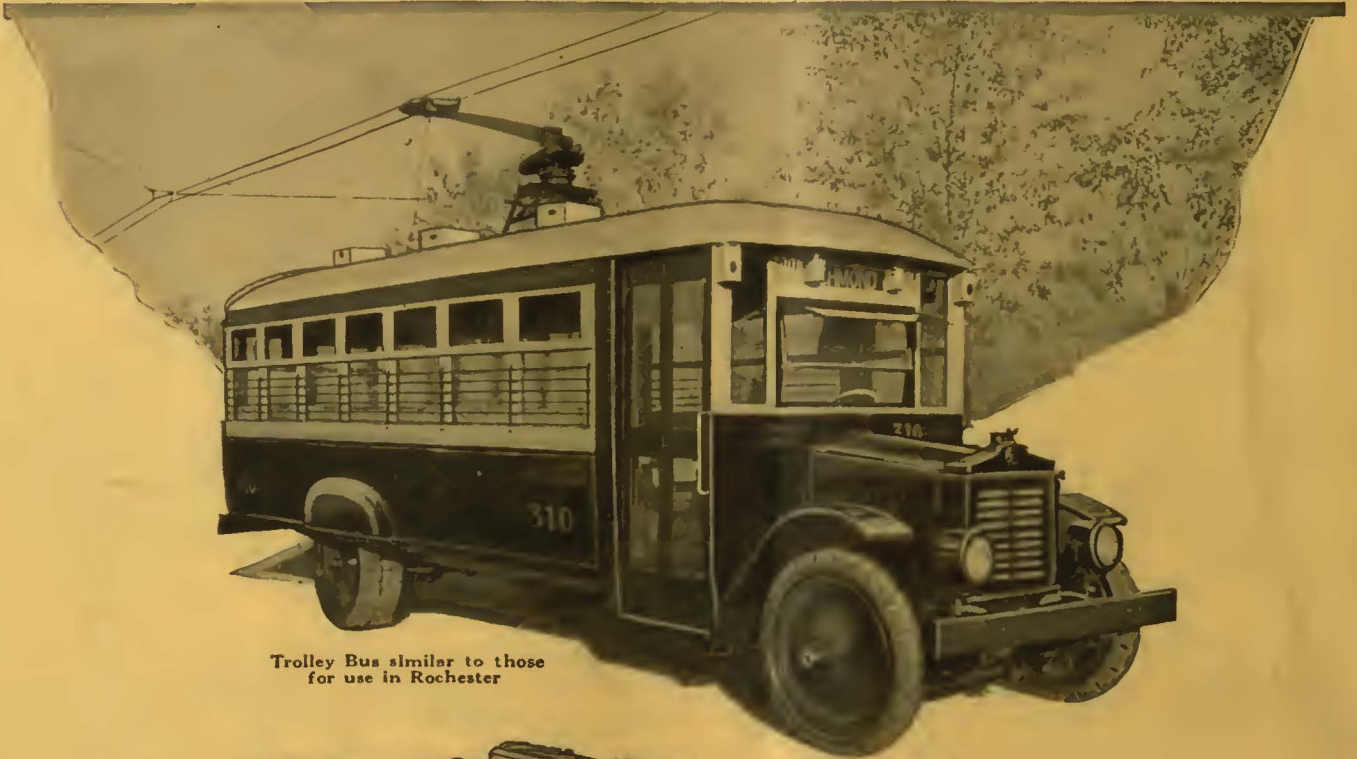
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Manufactured from specially imported cane in our own plant both the canvass-lined and unlined Rattan is ready for shipment to you in widths from 14 to 36 inches.

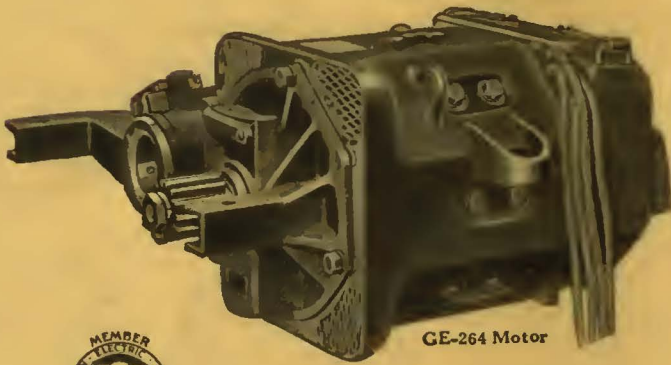


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ST. LOUIS, MO. CLEVELAND, OHIO. SPRINGFIELD, MASS.

5 Trolley Buses ordered for Rochester



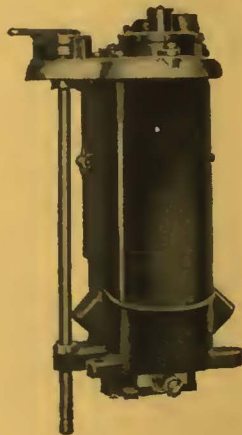
Trolley Bus similar to those
for use in Rochester



GE-264 Motor



Motive equipment which has proved its suitability for light-weight cars on electric railways all over the country is the logical power for driving the trolley bus. Considering the experience of the General Electric Company in this line, trolley buses "GE equipped" means equipped to give successful service.

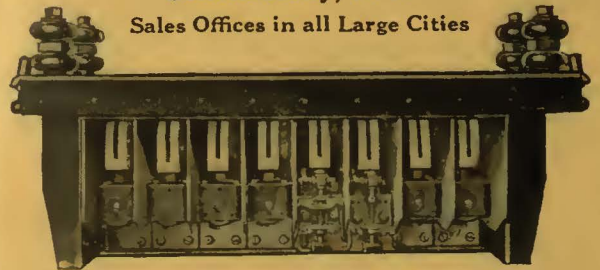


ANOTHER road to supplement its service with trackless trolleys is the New York State Railways, which recently purchased 5 trolley buses for operation in Rochester.

These new buses will be "GE equipped" with motive equipment consisting of the GE-264 light-weight Motor and type "M" foot-operated Control.

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