

ELECTRIC RAILWAY JOURNAL



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AUTOMATIC INFALLIBLE

There are three distinct registering features:

The first gives a visible and audible record of all fares paid.

The second records an analysis of total fares paid by separate cyclometer on fare box proper.

A third dial calls attention to individual fares as deposited.

This equipment can be set to handle six kinds of coins at once.

The illustration shows the New Johnson Fare Box in service on a car of the Chicago Surface Lines.

JOHNSON FARE BOX COMPANY
Ravenswood, Chicago

The new JOHNSON Fare Box



A Merry Christmas

"Joe," said the Vice-President, "Christmas time is here again with its rejoicing and happiness. See that everyone in our employ is as happy as it is possible and consistent for us to make it. Let every man and woman off to enjoy the day that our service and obligation to the public will permit. Convey to all of our people our best wishes for a good, old-fashioned Merry Christmas."

"Thank you, Boss," responded Joe appreciatively. "All of us reciprocate the same good wishes to our Management. The Educational Work of the Public Relations Department during the year has accomplished wonders in acquainting all of our people with the problems of our Management. This accounts for the splendid morale and sympathetic understanding that now prevail among us. You may tell the President and our Board that all repair and inspection shops will be closed Christmas day. Equipping our cars with Westinghouse HL control and motors makes this possible."



Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.



Westinghouse

ELECTRIC RAILWAY JOURNAL

HENRY W. BLAKE, Editor

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They Take the "Journal" Home to Read

ON AN editorial mission, I stopped in the office of the electrical engineer of one of the larger railway organizations and had a few minutes to wait while he finished a conference in another office. I looked around for something to read and found a goodly assortment of technical journals all pertinent to this work, but not a copy of *Electric Railway Journal*. I was a little surprised, because I knew the man used to read the *Journal* consistently. Later, when we got to talking, I said, "What's the matter with the *Journal*? I don't see any signs of it around here."

"Don't worry," he said, "I take the *Journal*, all right. I take it home with me the day it comes and read it from cover to cover. Why, do you know, I have every copy you have published since 1910, when I started reading it. I keep them at home where I can get at them when I want to."

"That's different," I said. "I'm glad to know it's worth that much to you."

"All the other fellows do the same thing," he went on. "On Tuesday *Electric Railway Journals* are as scarce as hen's teeth when you want one. We get them here on Monday and every single fellow carries his copy home to read, just as I do, and there's hardly one to be found in the office on Tuesday. There's always something in every issue for us to learn something from."

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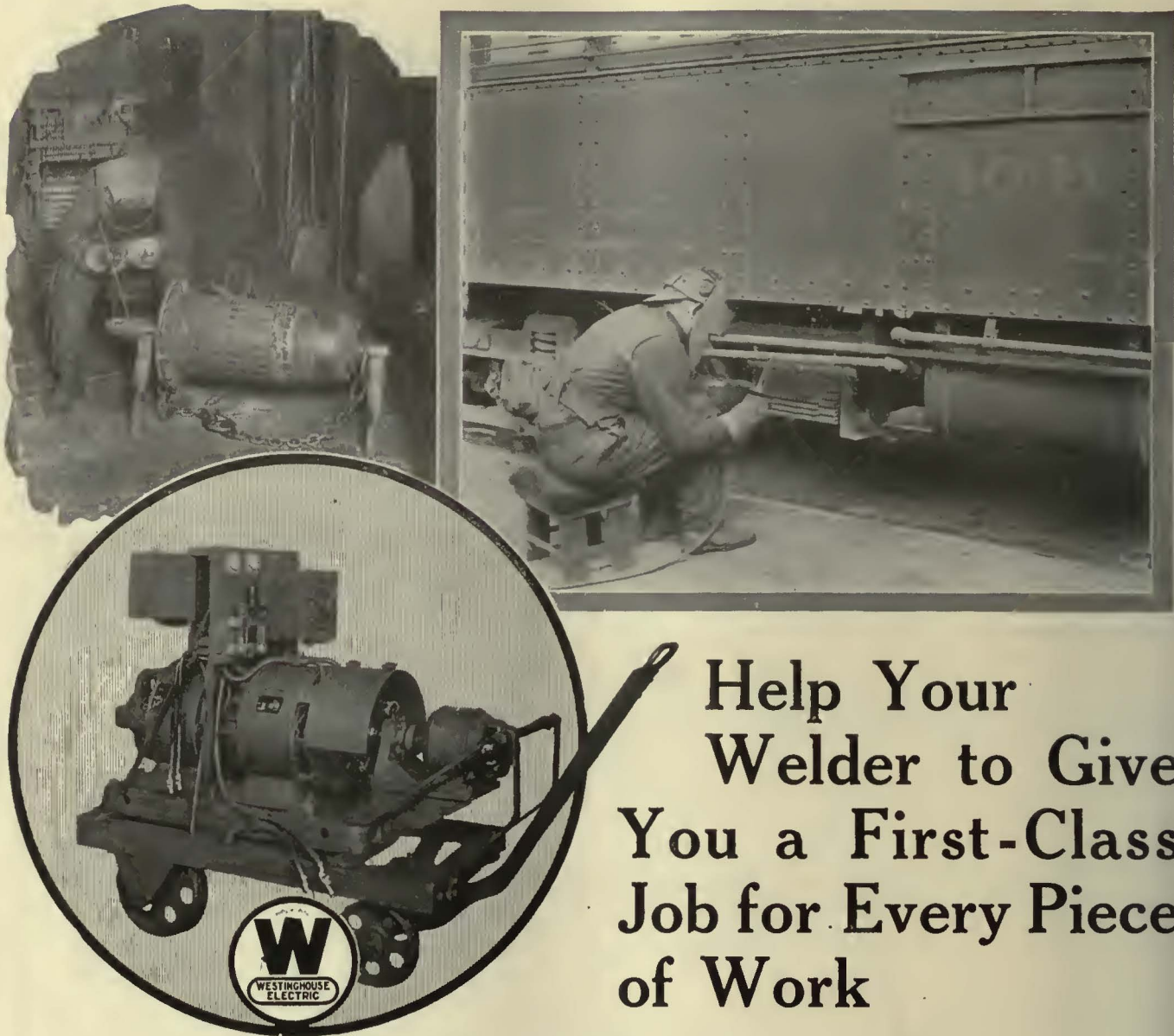
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Help Your Welder to Give You a First-Class Job for Every Piece of Work

Buy Him a Westinghouse Arc Welder

The idea back of this Westinghouse Arc Welding Set was to build a machine that would assist the operator in obtaining good welds consistently, hence the simplicity of the design and the rugged construction.

Penetration of deposited metal and fusion are essential to good welding. The feature of the Westinghouse set is a welding generator that assists in obtaining these characteristics combined with an electrical characterization that makes it easy for the operator to

strike and maintain the arc.

The simplicity of the design, throughout, is typified by the single control rheostat, for adjusting the current over certain ranges. The motor is especially designed to operate over a wide voltage limit as frequently encountered in trolley service, without a speed fluctuation that annoys the operator and causes him to lose time by readjusting the current or sacrificing the weld.

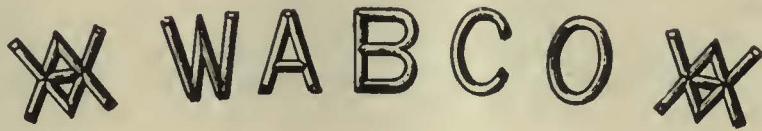
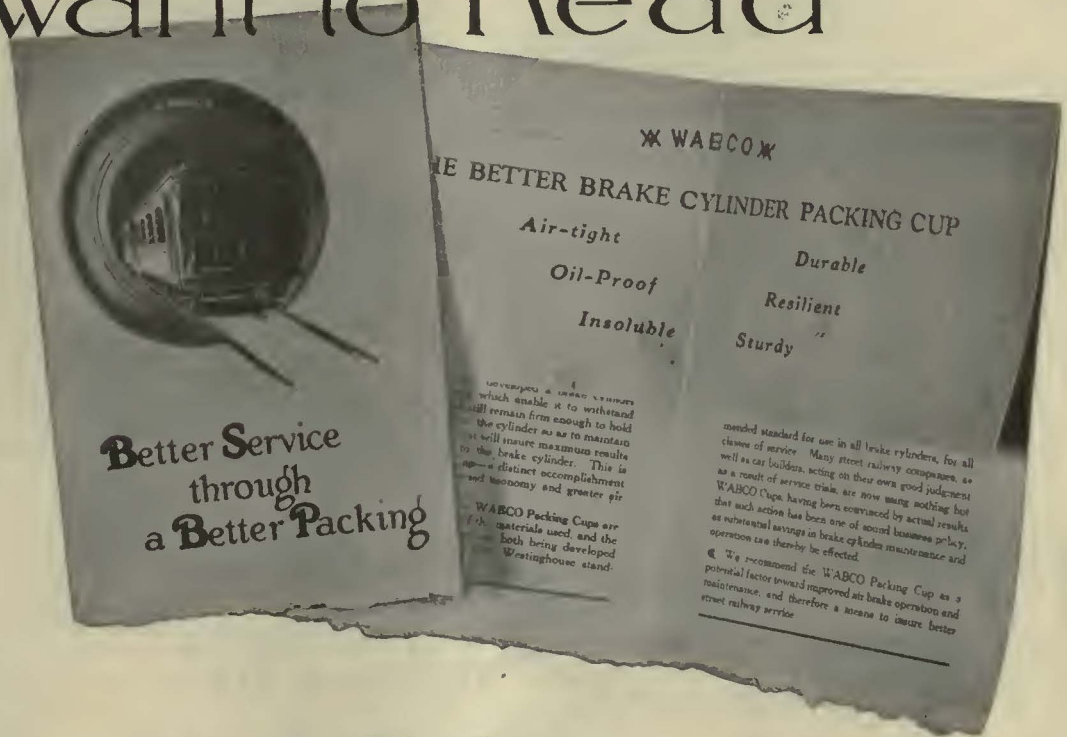


Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

Westinghouse

ARC WELDING EQUIPMENT

A Folder You'll Want to Read



TO the public the Air Brake is a safety device. To the railway man it is also an indispensable time-saver and money-earner. A prime factor in its efficiency is the brake cylinder packing cup. That is why we want every traction official and employee to know about WABCO, the remarkable new discovery in packing cup construction. Send now for your copy of our new folder, "Better Service through a Better Packing." You will be interested in this presentation of vital facts.

Westinghouse Traction Brake Company
General Offices and Works: Wilmerding, Pa.

OFFICES:
 Boston, Mass.
 Chicago, Ill.
 Columbus, O.
 Denver, Colo.
 Houston, Tex.

OFFICES:
 Los Angeles
 Mexico City
 St. Louis, Mo.
 St. Paul, Minn.

OFFICES:
 New York
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 Seattle
 San Francisco



WESTINGHOUSE TRACTION BRAKES



It's Surprising What An Old Car Will Do!

BREATHE new life and earning-power into those old-type cars. Cut down the excessive operating cost. Turn losses into profit by the Safety Car plan.

It's surprising what an old car will do when equipped for Safety Car operation.

The above photograph is that of an old two-man, double-truck unit,

weighing 44,000 pounds and seating 44 passengers, which has been converted for one-man operation with the usual satisfactory results. Note the rear door control exercised by the operator through the use of the new Selector Valve.

Old cars of almost any size or type can be made over into Safety Cars at a very nominal cost. Consult us for further details and advice.



SAFETY CAR DEVICES CO.

OF ST. LOUIS, MO.

Postal and Telegraphic Address:
WILMERDING, PA.

CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

We furnish the Air Brake and Safety Car Control Equipment which *makes* the Safety Car

Use O-B AW-7 and AW-8 Rail Bonds To get good bonding and keep it

Good bonding is a first essential of economical operation. And O-B AW-7 and AW-8 are the economical ways to get good bonding that stays good.

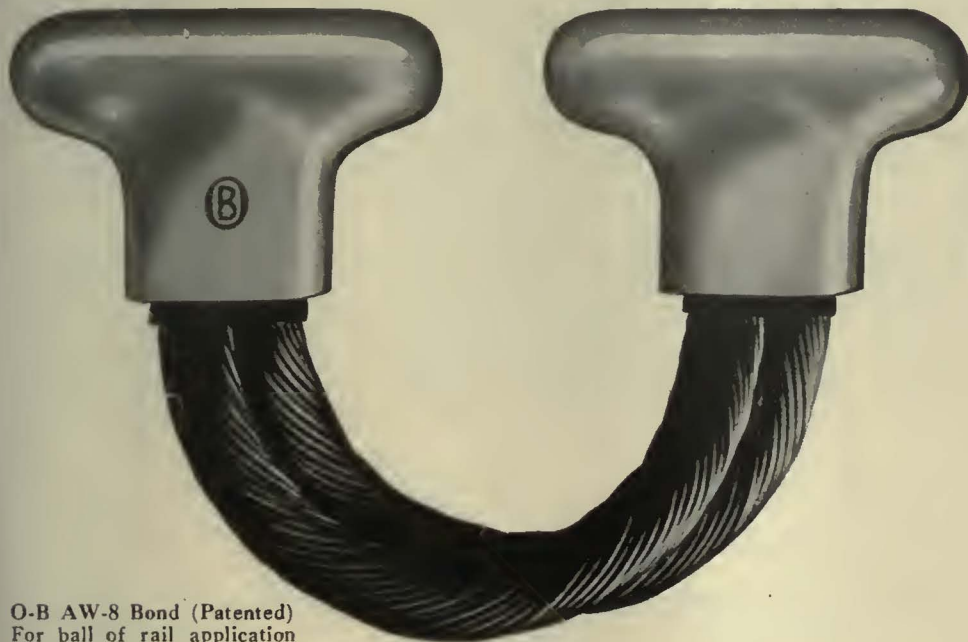
Every design detail of O-B AW-7 and AW-8 Bonds contributes to good work or to long life or both. For instance:

Copper strands are thoroughly welded, at the factory, into a heavy steel terminal which protects the copper during welding, which adds strength to the weld and which provides "steel to steel with steel" welding on the job.

O-B AW-7 and AW-8 Bonds have a wide

angle welding scarf—better than 90 degrees—which makes good welding possible and which gives room for an adequate volume of metal.

A copper sleeve, around the strand where it joins the terminal, absorbs and damps vibration.



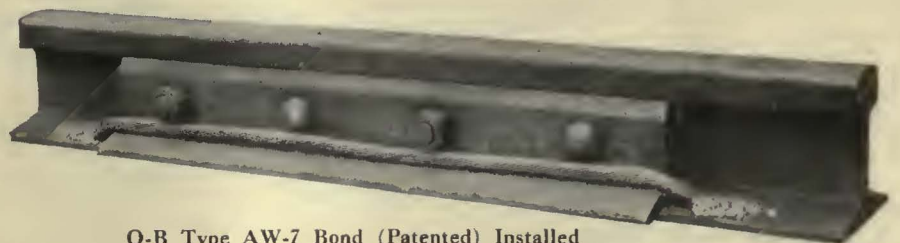
O-B AW-8 Bond (Patented)
For ball of rail application
Shown full size.

O-B AW-7 and AW-8 Bonds improve the return circuit enough to pay for themselves and then stay on the rails to earn a clear profit.

Better order now while you can get shipments from stock.

Arc Welding Machines

Wilson Plastic Arc Rail Bond Welder embodies the latest and best principles of arc welding in a form suited for track work. It is a dynamotor. O-B Grid Type Resistance Welder includes some unique control features which bring speed and safety to the work.



O-B Type AW-7 Bond (Patented) Installed
It is easy to weld on all sides of the rounded terminal.

The Ohio **(B)** Brass Co.
Mansfield, Ohio, U.S.A.



New York Philadelphia Pittsburgh Charleston, W. Va. Chicago Los Angeles San Francisco Paris, France
Products: Trolley Material, Rail Bonds, Electric Railway Car Equipment, High Tension Porcelain Insulators, Third Rail Insulators

Insurance plus Marsh & McLennan Service

A Worth While Saving

The Service of Marsh & McLennan Engineers results in a direct dollars and cents saving in insurance cost.

A large Eastern corporation, for example, was able to reduce its insurance cost from \$17.50 per thousand to \$4.30 per thousand, by carrying out the recommendations of our engineering service.

We will be glad to outline this service to business executives who are interested in reducing insurance costs.

MARSH & MCLENNAN
175 W. Jackson Blvd. Chicago, Ill.

Minneapolis
New York
Detroit

Denver
Duluth
Columbus

San Francisco
Seattle
Cleveland

Winnipeg
Montreal
London



Trained Eyes and Steel Ties

IN the course of experience an Engineer develops unconsciously a faculty of measuring the strength of material with his eye—of checking without calculation by his visual preception the correctness of any construction—always when faced with this test Steel Twin Ties get the nod of approval.

THEY'RE big enough for the work they have to do—140 pounds of steel—156 square inches of bearing per track foot and this at no greater cost than wood ties in ballast—in many localities at a large first cost savings over wood ties in concrete.

See them in your 1923 construction

THE INTERNATIONAL STEEL TIE CO.
Cleveland

Steel Twin Tie Track



For Your Safeties

Illuminated Destination Signs

Steel Gear Cases

Motormen's Seats

Faraday Car Signals

Lighting Fixtures

Golden Glow Headlights

Headlight Resistances

Air Sanders

Trolley Catchers

Shelby Trolley Poles

Rotary Gongs

International Fare Registers

Fare Register Fittings

Samsop Cordage

Air Valves

Cord Connectors

Trailer Connectors

Automatic Door Signals

Standard Trolley Harps

Standard Trolley Wheels

Keystone Safety Car Specialties

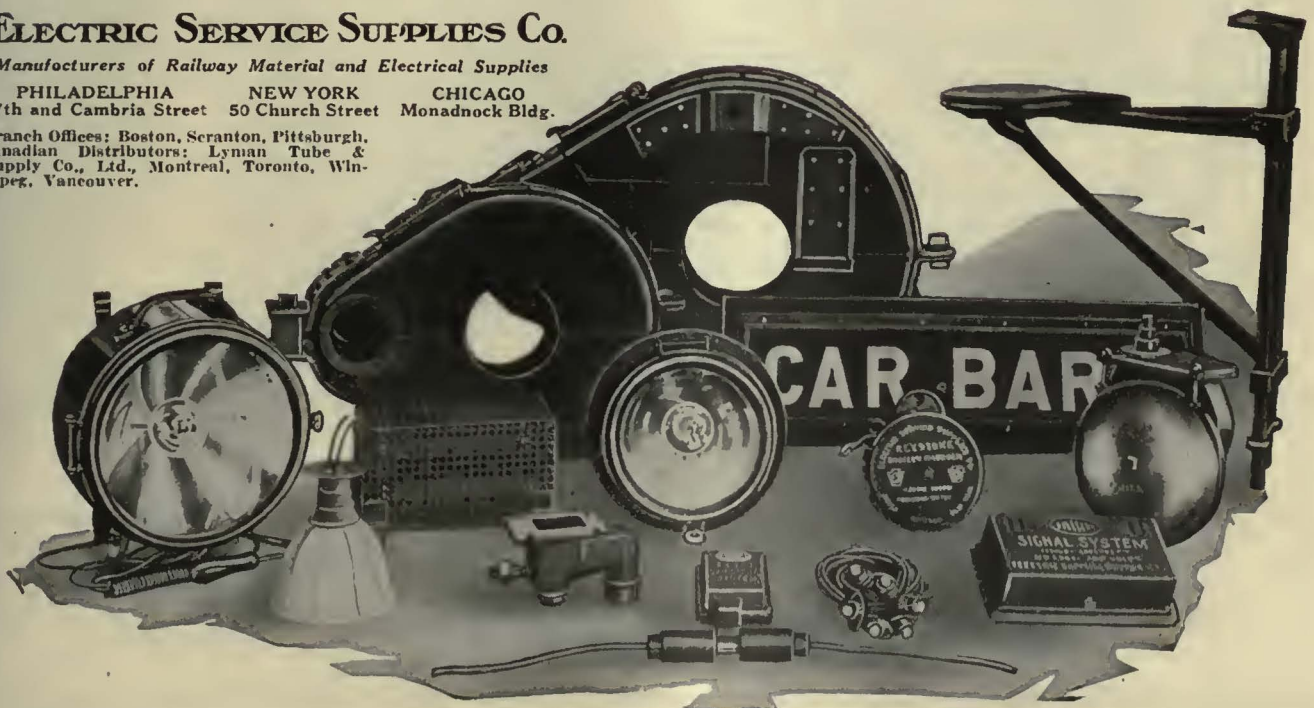
Send for the Safety Car Book and data sheets illustrating and describing Keystone Safety Car Specialties in detail. You'll want this book if you are thinking of ordering Safety Cars or converting double-platform cars into one-man cars.

ELECTRIC SERVICE SUPPLIES CO.

Manufacturers of Railway Material and Electrical Supplies

PHILADELPHIA NEW YORK CHICAGO
17th and Cambria Street 50 Church Street Monadnock Bldg.

Branch Offices: Boston, Scranton, Pittsburgh,
Canadian Distributors: Lynian Tube &
Supply Co., Ltd., Montreal, Toronto, Win-
nipeg, Vancouver.



rust-resisting STRAND the result of *pure metal*

WIRE corrodes on account of chemical and physical differences within the metal.

Page-Armco Strand is produced from Armco Ingot Iron (99.84% pure) free from segregations which would tend to invite corrosion.

The extra galvanized coating on Page-Armco Strand combined with the purity of the wire insures maximum service.

Page-Armco Iron Strand is used as messenger strand, guy wire or strand, telephone wire or strand, trolley span wire, ground wire or strand, telegraph wire, and as power transmission conductors.



Page Steel and Wire Company

Bridgeport, Conn.

District Sales Offices:

Chicago

New York

Pittsburgh

Portland, Ore.



INGOT IRON

San Francisco

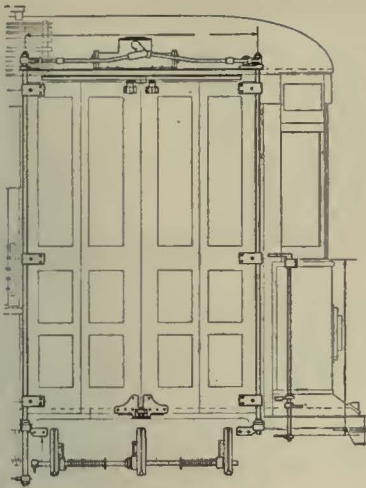
MANUFACTURERS OF

Rods—Armco Ingot Iron and Special Analysis Steels.

Wire—Plain and Galvanized — Spring, Rope, Telephone, Telegraph, Bond, Strand, Oxyacetylene and Electric Welding Wire.

Fence—Woven Wire for Farm and Railway Right of Way, Wire Link Protection for Industrial Plants, Lawns, Schools and Estates, and Factory Partitions.

PAGE-ARMCO INGOT IRON GALVANIZED STRAND



Inside or Out!

No Half-Way Business About It

Accident reduction in recent years has been chiefly among that class of cases known as the "boarding and alighting" kind. And more responsible for the improvement than any other single thing, has been the enclosed platform where doors and steps are interlocked with starting signals or control. This means that when the car is started there are no passengers left in dangerous positions, half way on or off the car.

National Pneumatic Devices have consistently lead the way and filled the bill in this development. They are widely used because on purely economic ground alone they save their cost in damage claims.

NATIONAL PNEUMATIC

Door and Step Control
Motorman's Signal Lights

Door and Step Operating Mechanism
Safety Interlocking Door Control
Multiple Unit Door Control

Manufactured in Canada by
Dominion Wheel & Foundries, Ltd.
Toronto, Ont.

National Pneumatic Company, Inc.

Originator and Manufacturer

50 Church St., New York

McCormick Bldg., Chicago

Works: Rahway, N. J.

Advertising Needs Time to Develop Opportunities

Give Advertising Time: That is the thing it needs most.

The advertising agency is the precocious infant among the professions. One of the oldest agencies in New York prints on its letterhead the date of its founding, and that date is 1869! Think of it—almost ten years after the Civil War; and the boys of the Civil War are still alive among us.

Law traces its ideals and traditions back to Moses; but even Law is not free from missteps. The physician takes his Hippocratic oaths, and Hippocrates lived 400 B. C.

Yet it was only yesterday when doctors discovered that bad teeth can cause anything serious. Is it fair to expect perfection in a profession that counts only a single generation to its credit? Should it occasion surprise when even a well-laid advertising campaign goes wrong? Is it any wonder that workers whose chief raw material is human nature should have to confess that they cannot always tell in advance just how that raw material will act?

We are learning. We have just passed through one great cycle of inflation and deflation. We know now what happens to the automobile business, and the shoe business and the perfumery business when prices go up like a rocket and come down like a stick. How much wiser counsellors to our customers we shall be when another cycle swings around. How much better

we shall be able to read the signs of the storm, having passed through one such tempest.

Do you remember the references in English novels to those old law firms — solicitors—in which sons have succeeded their fathers to the third and fourth generation? Each new generation of lawyers has handled the affairs of the new generation among its clients, dealing out counsel based on records which run back for a hundred years or more. There is no reason why advertising agencies, too, should not outlive their founders and the successors of their founders, growing wiser with each generation and gathering a priceless possession of recorded experience.

Think of an advertising agency in 2020 being able to turn back in the records to 1920 and say to its clients? "In the Fall of 1920 this happened in silk, and this happened in leather and this happened in wheat, and the selling problems which followed were so and so. The present situation has certain aspects that are similar; and the recommendations which we are presenting are based on a recognition of that fact."

We are gaining experience; we are growing more and more valuable as advisers every year.

Don't expect the impossible.

Give advertising time.

(Published by the Electric Railway Journal in co-operation
with The American Association of Advertising Agencies)

AJAX

Electric Arc Welder



The Machine for the Practical Man

Something simple and rugged, easily understood as to operation, and without complications as to maintenance. For these reasons the Ajax Electric Arc Welder has enjoyed a rapidly spreading popularity among electric railway track-men, *the men who do the work*. They approve it because it does the most satisfactory kind of work with the minimum labor and least delay.

Note the features of particular appeal to the practical man. Ajax Electric

Arc Welder is most easily handled, it weighs but 155 lbs. and has convenient carrying handles. It is small enough to carry on a passenger car platform or the smallest Ford truck. It possesses unusually high amperage capacity even at low trolley voltages and will make a deep, strong weld under most adverse conditions. Every part is accessible and easily replaced in case of damage.

Order an Ajax Electric Arc Welder for your welding crew to try.

--and on the track grinding end

UNIVERSAL Rotary Track Grinders

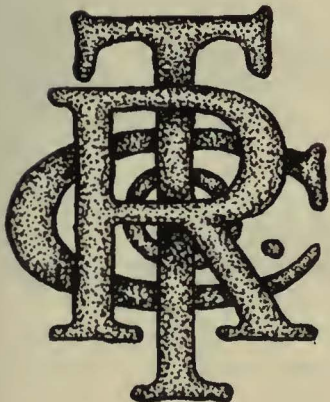
are most efficient, fast and satisfactory for removing surplus metal after welding, grinding grooves, and smoothing special work.

Reciprocating Track Grinders

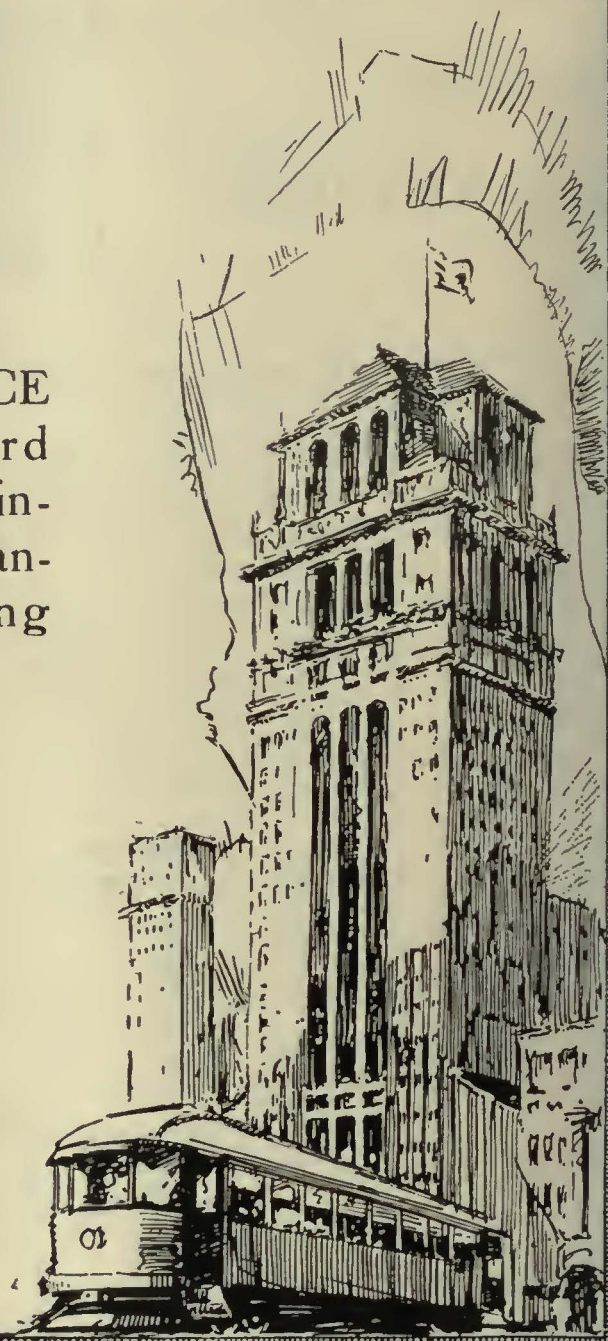
are used almost universally for removing corrugations and restoring original contour of worn rail head.

RAILWAY TRACK-WORK COMPANY
3132-48 E. Thompson St., Philadelphia, Pa.

AGENTS:
Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
Equipment & Engineering Co., London, England
At as Railway Supply Co., Chicago
P. W. Wood, New Orleans



COLLIER SERVICE sustains car card space value by maintaining a nation-wide organization of car advertising experts.



CANDLER BUILDING, THE HOME OF COLLIER SERVICE.



CANDLER BLDG NEW YORK



Confidence!

Confidence in the "P & H" Guaranteed Penetration Process" has been thoroughly established by the manner in which it has withstood every test. The lead shown here is typical of the many lines throughout the nation built of "P & H" Guaranteed Penetration Process Poles

The "P & H" Guaranteed Penetration Process

guarantees to the buyer, in writing, a full one-half inch uniform penetration of the preservative throughout the ground line area. The Butt-Treating price is refunded on any pole that does not show this definite specified result.

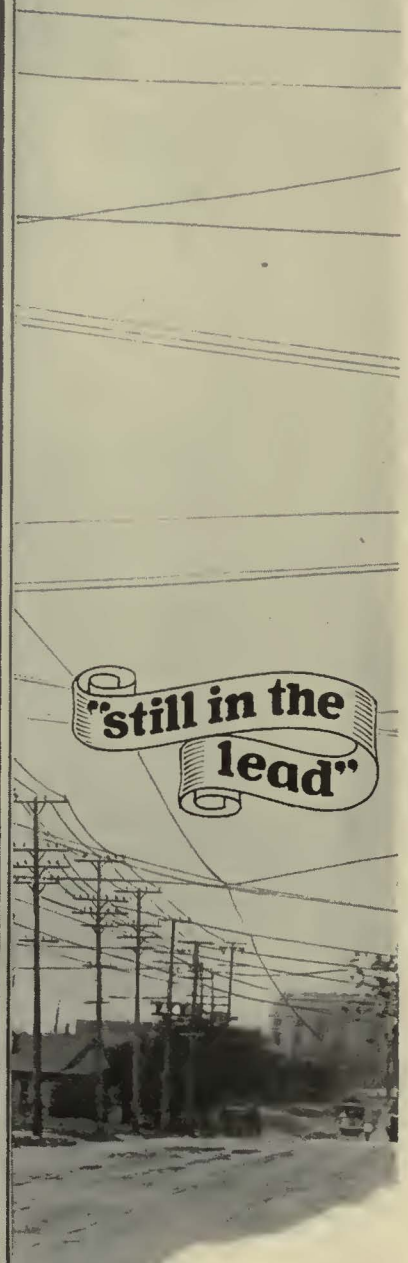
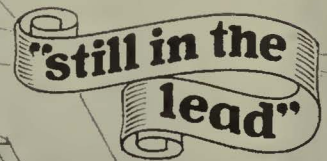
Don't be satisfied with guesswork—in-sist on the genuine "P & H" if you want the lowest maintenance costs, the most reliable pole service, the longest pole life.

We can fill any pole needs—for Butt-Treated and untreated Northern White and Western Red Cedar Poles—or for any form of Butt-Treatment.

Prompt shipment assured by the convenient location of our yards in the North Central and Western States.

Get the facts about Butt-Treatments—write for folder.

Copyright 1922, by P. & H. Co.



"P & H"
Guaranteed Penetration
Process Poles in lines of Dallas
Power & Light Co., Dallas, Texas

PAGE AND HILL CO.

MINNEAPOLIS, MINN.

New York, N. Y. 50 Church St.
Chicago, Ill., 19 So. LaSalle St.

Kansas City, Mo. 717 Bryant Bldg.
Omaha, Neb., 513 Electric Bldg.

Grand Rapids, Mich., Powers Bldg.

Houston, Texas, 1111 Carter Bldg.
Dallas, Texas, 311 Sumpter Bldg.

Buffalo, N. Y. 950 Ellicott Sq. Bldg.
Louisville, Ky. 1416 Starks Bldg.

3,000 high grade (mostly Tool Steel)
gears saved from scrapping by
"Tool Steel" WISDOM TOOTH pinions.

Here's the story: A large city railway line with heavy motors and severe service had tremendous tooth breakage on every type of pinion. Pinion expense and disturbance to running schedules had become so great that they had decided to completely change over from standard tooth shape to long and short addendum gearing. This would eventually have meant the scrapping of gears of all of their 3,000 motors.

In place of this, they tried "Tool Steel" Wisdom tooth pinions and after about 18 months' successful tests, standardized on them, getting all the benefits of the long and short addendum shape without any expense other than the normal renewing of pinions as their old ones wore out or broke.

Wisdom tooth pinions do not cure everything but it will pay you to know their story as they may some day be much needed on your property.

The Tool Steel Gear & Pinion Co.

Cincinnati, Ohio

OF A SERIES OF ARTICLES PICTURING THE INFLUENCE OF THE ENGINEER IN THE AFFAIRS OF THE WORLD. PRESENTED BY THE MCGRAW-HILL COMPANY, INC., WHOSE PUBLICATIONS HAVE SERVED THE ENGINEER THROUGH HALF A CENTURY OF INDUSTRIAL PROGRESS

Coal Age

Power

THE BREADTH OF ECONOMICS

Electrical World

Engineering News-Record

AN old word with a new meaning has been introduced into the affairs of men. The power of words is very great and an understanding of them is one of the essentials to progress.

Electrical Merchandising

Bus Transportation

¶ The advancement of humanity hinges, to an almost menacing extent, upon a complete conception of the word *economics*. Once popularly confined to finance, it has grown to involve the whole realm of human activity.

American Machinist

Electric Railway Journal

¶ Now man is the economic factor in the work of the world. Whatever he does, the result—time, effort, ability and resources engaged—must prove up under the standards of economics, or be judged unworthy.

Industrial Engineer
(Published in Chicago)

¶ But who has brought about this change, this revision in the conception of man's advancement, of man's inevitable responsibility? And who has given this word so vast a power over human destinies and has caused so gigantic a revolution for the benefit of all humanity?

Ingenieria Internacional
(Printed in Spanish)

¶ The engineer. His is the responsibility. He it is who has introduced economics into all the affairs of men. He it is who has provided the world with a new basis for judgment and appreciation.

Engineering and Mining Journal-Press

¶ The engineer, who has made life assume a scientific instead of a chaotic aspect; who has developed an exactness of procedure; who has worked out cause and effect on a calculable basis; who is even now reducing the fever of misapplication of life's priceless energies and putting them to the service of constructive happiness.

Chemical and Metallurgical Engineering

¶ It will be many generations before the mass of humanity knows and acknowledges its debt to the engineer, who so quietly brings about such stupendous revolutions and revelations, and who takes the past and links it to the present for the benefit of the future.

American Machinist
European Edition
(London)

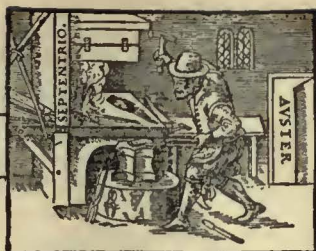
¶ Yet while the acknowledgment may be long in coming, the engineer has his reward in the knowledge of work well done, in the joy of accomplishment, in the feeling of power which gives him the opportunity to direct the courses of men even before they are aware of the source of authority.

Journal of Electricity and Western Industry
(San Francisco)

McGRAW-HILL COMPANY · INC ·

NEW YORK

FROM GILBERT'S



DE MAGNETE

“WORD MONGERS” and “CHATTERING BARBERS”

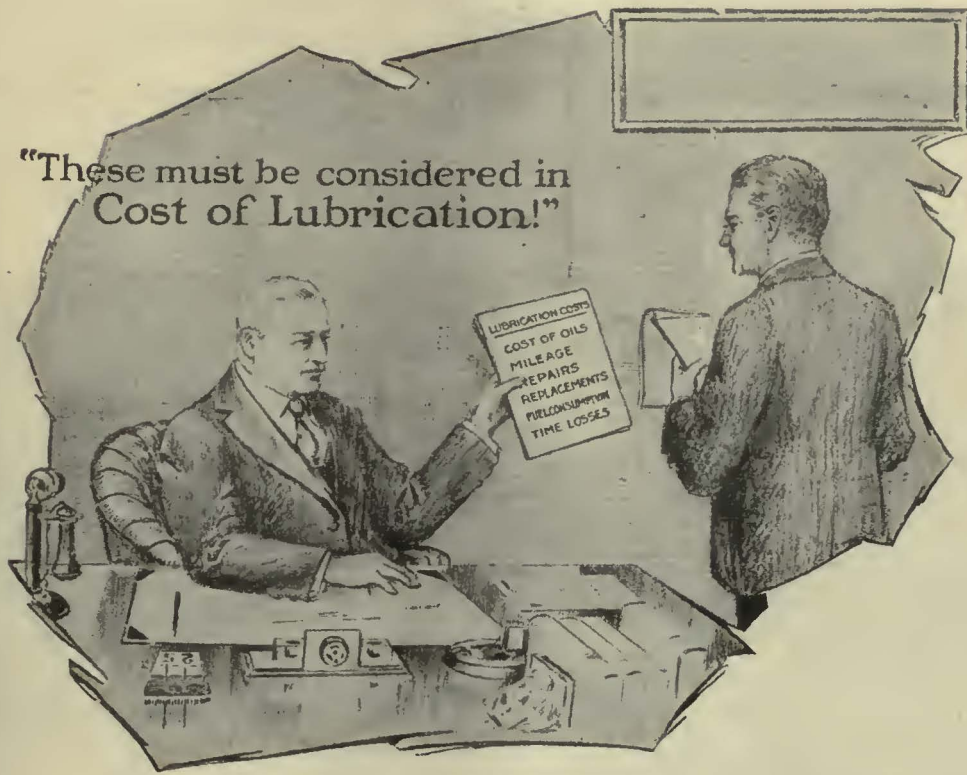
“Word mongers” and “chattering barbers,” Gilbert called those of his predecessors who asserted that a wound made by a magnetized needle was painless, that a magnet will attract silver, that the diamond will draw iron, that the magnet thirsts and dies in the absence of iron, that a magnet, pulverized and taken with sweetened water, will cure headaches and prevent fat.

Before Gilbert died in 1603, he had done much to explain magnetism and electricity through experiment. He found that by hammering iron held in a magnetic meridian it can be magnetized. He discovered that the compass needle is controlled by the earth's magnetism and that one magnet can remagnetize another that has lost its power. He noted the common electrical attraction of rubbed bodies, among them diamonds, as well as glass, crystals, and stones, and was the first to study electricity as a distinct force.

“Not in books, but in things themselves, look for knowledge,” he shouted. This man helped to revolutionize methods of thinking—helped to make electricity what it has become. His fellow men were little concerned with him and his experiments. “Will Queen Elizabeth marry—and whom?” they were asking.

Elizabeth's flirtations mean little to us. Gilbert's method means much. It is the method that has made modern electricity what it has become, the method which enabled the Research Laboratories of the General Electric Company to discover new electrical principles now applied in transmitting power for hundreds of miles, in lighting homes electrically, in aiding physicians with the X-rays, in freeing civilization from drudgery.

General  Electric
General Office Company Schenectady, N.Y.



Analyze Your Lubrication Costs

WERE "cost of oils" the only item involved, it would be a simple matter to figure the exact cost of lubrication.

But it stands to reason that expenses arising from causes plainly traceable to deficient lubrication are as much a part of lubrication cost as the oil itself.

Practical executives are awakening to the fact that cheap oil means anything but cheap lubrication; that the losses in mileage, repairs and replacements of bearing parts, depreciation and labor—

always evident with their use—make the purchase of cheap lubricants a most expensive proposition.

Every street railway has, in its own records, the means of checking up and ascertaining the correct cost of lubrication as accurately as it can determine net income.

The ultimate economy of Galena Lubrication is plainly apparent when SERVICE, the true determining factor of values, is recorded.

"Galena Service is an insurance of efficiency and economy!"



Galena-Signal Oil Company

New York

Franklin, Pa.

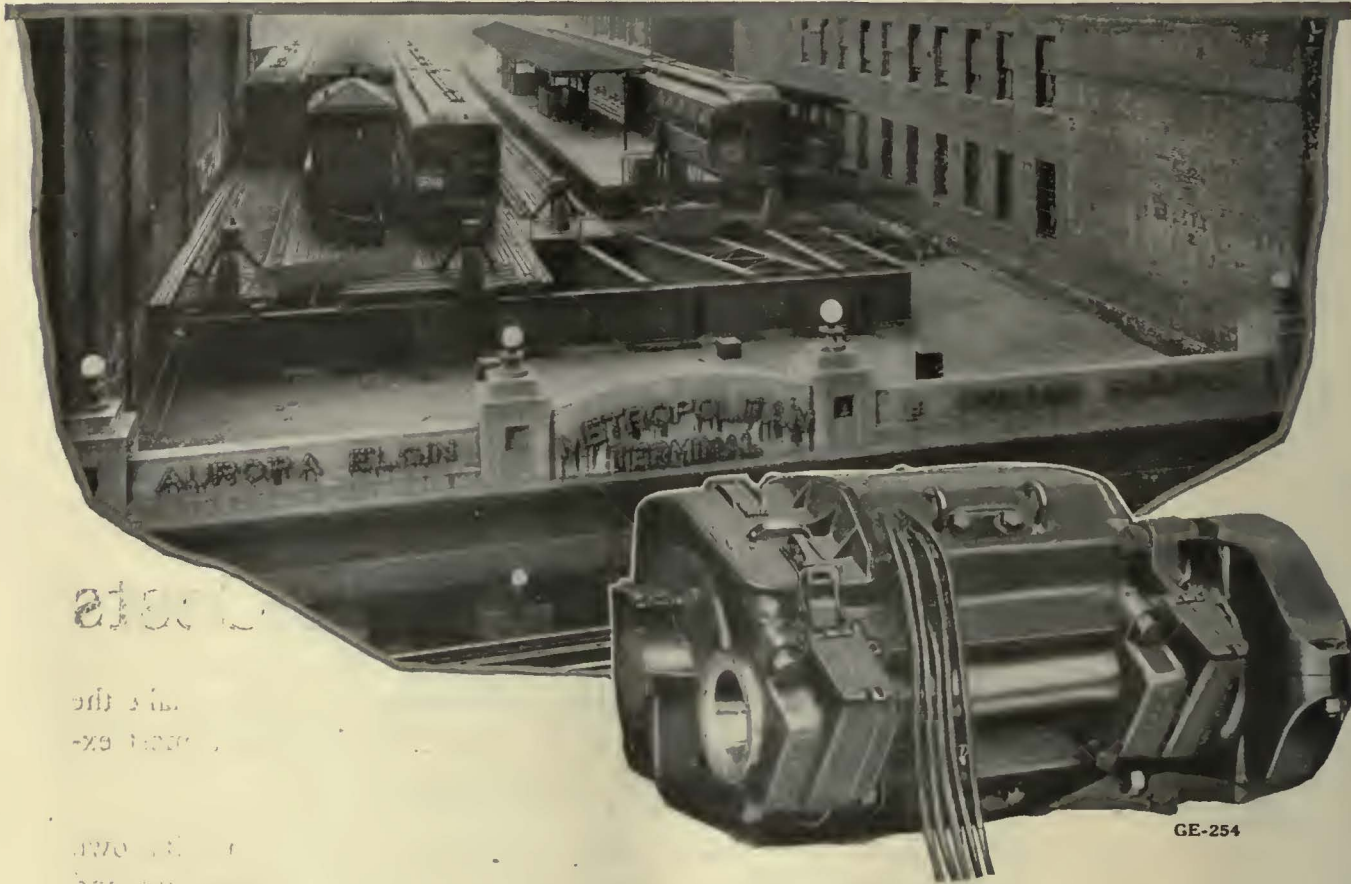
Chicago

and offices in principal cities





Third-rail Road Adds More Equipment



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Standardized on "G-E"

One of the great third-rail systems of America, the Chicago, Aurora & Elgin Railroad, has just completed 20 years of service. Reorganized now as a purely heavy-traction system, this road is on its way to still greater usefulness as shown by its recent order for 20 steel passenger cars, including a diner.

For years, G-E motors have been standard on the Chicago, Aurora & Elgin, first used in fours on the motor cars and then in pairs on motorized trailers. For its new rolling stock, G-E motive equipment was selected because of the reliable performance that has been given by the older G-E equipment in this severe service.

So that, equipment for the 20 new cars includes GE-254 motors and type M control, duplicating that now in operation.



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ELECTRIC RAILWAY JOURNAL

Consolidation of *Street Railway Journal* and *Electric Railway Review*
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New York, Saturday, December 23, 1922

Number 26

How Shall Stranded Wire or Cable Be Specified?

ONE of the knottiest little problems now confronting power distribution engineers is to settle upon some standard way of specifying the sizes and types of stranded wires and cables. The American wire gage provides for solid wires through practically the entire range of commercial requirements. Unfortunately, when expressed in circular mils, the areas all come out in odd numbers, but there are fairly good reasons for the use of the present gage sizes in the "A.W.G." The most important of these is the difficulty that would be occasioned by any attempt to change them.

The situation is quite different once the "A.W.G." boundary is passed. For convenience in handling, conductors larger than No. 0000 must be stranded. There is as yet no general agreement as to how the sizes of these conductors should be specified, that is whether their sizes should be stated in terms of total circular mils of cross-section or in number of strands of wires of the standard gage. Obviously the same total area can be secured with the use of a variety of strand sizes; the greater the number of strands the more flexible being the cable. If a given total area is specified, there must be a certain latitude or tolerance permitted the manufacturer, because otherwise he would be obliged to draw special sizes of strand.

The purchaser of a stranded wire or cable has essentially to specify the number of strands, as well as the area, to secure the current-carrying capacity which he desires combined with the required flexibility. It would therefore seem desirable to make up the standard specifications on the basis of the number of strands and sizes of strands. For each approximate total area there could be a sufficient variety of stranding to meet commercial needs in regard to flexibility. For the convenience of purchasers, the approximate size of each stranded conductor could be given in the tables.

The Inductive Interference Problem Can Be Solved Only Through Co-operation

ONE of the subjects assigned to the Engineering Association committee on power distribution this year is that of "inductive co-ordination." This relates to the harmonizing of differences in regard to the phenomena long and unfortunately grouped under the term "inductive interference." This committee ought to be able to foster the spirit of co-operation suggested by the comparatively new but generally acceptable term "inductive co-ordination," a spirit which is in every way preferable to the conflict suggested by the older term.

The accepted use of the term "inductive co-ordination" in itself indicates that a marked change in attitude on the part of leading engineers is taking place. This more constructive approach to the problem should be disseminated to the men all through the

utility fields, by means of such works as the report of this committee. All public utilities must co-operate along engineering lines if they are to furnish their maximum of public service. Of course, where electrical transmission forms an important part of a public utility service, there is always a likelihood of what has been known as "inductive interference." This must be controlled, and as no one utility can monopolize the ether, each must be willing to go to a reasonable expense to insure the safeguarding of its own service as well as the protection of its neighbors.

Beyond the direct advantage to the utilities in getting together, there is the further advantage that all public utilities will receive greater consideration at the hands of public utility commissions if it is understood that efforts are being made to settle differences along sound technical and economic lines. Among themselves utilities may have differences of opinion as to details and even as to principles. As a whole, however, they should present a united front, for it is enough that a commission should have to adjudicate the relations or differences between public and utility. It should not have to be called upon to settle differences of one utility with another.

Discontinuance of Tax-Exempt Issues a Benefit to All

MANY of those strongly in favor of the proposed constitutional amendment to stop the issue of tax-exempt bonds doubt whether it will ever pass, because they think the smaller and less populous states will be unwilling to give up the present privilege enjoyed by themselves and their subdivisions in issuing these securities. They point out that in the decision on a constitutional amendment of this kind, Idaho or Florida, for example, has as much voice as New York or Pennsylvania, although in these latter states the corporations which would indirectly benefit from such an amendment and the individuals who are now escaping a great deal of state taxation because of the exempt securities are much more numerous. As the less populous states are now selling their securities to citizens of the more populous states at far lower interest rates than would be possible if the amendment was in force, it is believed that it will be very difficult to get enough of them in line to pass the amendment.

It is to be hoped, however, that further discussion of the subject will indicate to the representatives of these states that their gain from such an amendment will be in equal if not greater ratio than that of the more populous and industrial states.

In the first place, it is not difficult to point out, as was done in the debate in the House this week, that the practical effect of the present amendment is gradually to exempt from taxation the very wealthy and to increase the taxation on those of moderate income. This is a matter which is a serious one to all states alike, but as the people of great wealth are most likely to reside near

the large industrial and economic centers of the country, the exemptions to the federal income taxes would be much more numerous in the Eastern and Central states than in the states farther west or south. This should mean that the practical effect of the opposition of an agricultural or mining state to the amendment is to assess on its inhabitants a greater portion of federal taxes to the extent that the very wealthy who are largely residents of other states escape taxation.

So much for the individual side of the question. Another point is the corporation side, and the effect on the country at large of a lessening of corporation activity as a result of the present policy. While the large industrial corporations usually have their financial offices in the older states, their fields of activity must be largely among the states requiring greatest development, whether their purpose is direct development like railroading, mining and power, or indirectly as in manufacturing equipment for these purposes. Here again is a place where the interests of the less populous states seem at least proportionately to be as great in the proposed amendment as the more populous states.

Lower Turnover of Trainmen Favors Better Merchandising

IT USED to be said that one big reason why it was hard to train platform men to be courteous was that they did not look upon their railway job as a lifework; that most of them were on the cars only until such time as they could get back to their trades. Therefore, they did not have the necessary incentive to take pride in their work.

Today matters are much better as regards turnover in the platform ranks. The motorman and conductor are paid a wage which relatively is so much higher than before the World War that there is no longer the old desire to quit at the first opportunity. One may say that such attractive outside opportunities are much fewer. The union itself also finds its interest served by making the men feel that they have permanent and not temporary occupations. One may say then that the casual character of platform work has largely disappeared.

At the same time, none of us should be satisfied that the platform man has improved as fully as is possible in those requisites that should go with an employee who so nearly is the personal representative of the company to the patron as he is. The principal task is to secure a greater degree of courtesy. On the average property, there is still a great field for improvement in developing the attitude of mind of both motorman and conductor that the passenger is their personal customer. Some railways have really accomplished something along this line, but the observations of the *Journal* editors are that the customer still gets pretty shabby treatment on many systems.

The problem is largely one of "selling" the trainmen the merchandising principles, and this task must start with the management. It can be followed up by the superintendents, but the spirit of the thing must emanate from the big boss.

Another point in this development of the merchandising atmosphere is that the conductor might be authorized under certain conditions to refund the fare, making report of each such transaction. Perhaps this would appease the ruffled customer in some circumstances and turn his antipathy. Suppose such a policy did cause

the loss of a few nickels a day, would that not be insignificant if the practice was found to help in winning friends, or in keeping from making enemies?

Our Heads Are Coming Out of the Sand

EVIDENCE is plain and plenty that a change of heart and mind is rapidly taking place with respect to the attitude of railway men toward the bus. Several of those who so vigorously opposed admitting bus companies to the transportation counsels of the American Electric Railway Association have already come to question the wisdom of their stand. There was a great tendency on the part of many of the important executives of the railway field to fight the bus, to have nothing to do with it themselves as a transportation tool. But several of these same men have since taken up operation of buses as adjuncts to their rail lines.

It has taken less than a year for them to grasp the fact that they must take hold of the bus. They must, because the public demands buses. They must because it is good transportation business to take care of the demand for a kind of service beyond that supplied by the rail lines. They must do it because there are places where the bus is economically the right form of vehicle. They must, anyway, whether altogether profitable or not, as a means of protecting present rail investment and maintaining their monopoly (which is sound principle from the public viewpoint) so that the bus service may be co-ordinated and helpful, not competitive and destructive. Let no one get the idea that the bus will replace the railway. The point is that the railway man must use the bus as well as the rail car in his business.

These comments are made not because of the opportunity to say "we told you so," but rather to bring out the fact that it now seems clear that those who took the position that buses should be used, and bus companies should be in the association, were right. The important thing now is not the error made (and it is being considered such, more and more), but to recognize the mistake and to revise the kind of thinking that has been going on while there is still time for constructive thinking to make the most of the bus—to avoid its potential destructiveness if its coming is unguided.

Why not give consideration again to an amendment of the American Association constitution to permit membership of the stable, legally recognized bus companies, as an early step toward harmonizing interests and avoid cut-throat fighting? Certainly, from the standpoint of helpful value to the bus transportation company, the American Electric Railway Association has much more to offer than any strictly bus association has now or will have for several years to come, provided the railway members really take a helpful and not antagonistic attitude. It would be to the best interests of the railways selfishly to do this.

The *Journal*, as one of the earliest advocates that railway men should make use of the bus and that bus companies should be taken into the association, feels that its position has been justified. And also, inasmuch as so many railway men were at first antagonistic toward the bus and objected to discussions of it in the *Electric Railway Journal*, the wisdom of satisfying that feeling but at the same time carrying on the educational work with both railway men and independent bus men by publishing a separate bus paper (*Bus Transportation*) may now be better appreciated.



RAISING LOWER MARKET STREET TRACKS AFTER THE FIRE

Three tracks raised and in service at new grade. The grade prior to raising is indicated by slot in old cable track not yet replaced by new construction.

Maintaining Continually Sinking Track

Nine Miles of Track in San Francisco Settles at the Rate of 0.1 Ft. per Year—Permanent Types of Construction Are Held Inadvisable—Methods Used for Restoring Grade Are Described

YEARS ago the shore line of San Francisco Bay extended a mile or more inland from its present location along parts of the San Francisco waterfront, but as the city developed the tide flats and shallows have been filled in so that much of the waterfront is now on filled land. The material used in making the fills has been of good quality, but the filled area has nevertheless continued to settle year by year because of the great depth of underlying soft mud. In the construction of the Southern Pacific Building on lower Market Street piles 125 ft. long were used and for this depth only soft material was encountered. All large structures in the filled area are built on piles, which support them at an established grade, while the streets continue to settle, thus making the situation worse than if structures and streets settled alike. Some of the problems brought upon the street railway by this

condition and the methods of meeting them are described in this article.

The Market Street Railway operates some 9 miles of track in the areas subject to settling and has found that the rate of subsidence is fairly uniform, being about 0.1 ft. per year. This has necessitated entire reconstruction of the tracks at intervals. Fortunately, in practically all of the areas affected the electric lines operate on double tracks, thus making it possible to avoid interruption to service by operating short portions as single-track lines during reconstruction.

All of the tracks east of the old shore line, as shown on the accompanying map, have been rebuilt since the fire of 1906; some of them have been raised twice in that time. Frequently a subsidence of 3 ft. and sometimes as much as 5 ft. occurs before the grade is restored. In 1911 the track on Third Street was brought



TYPICAL TRACK RAISING OPERATION ON DOUBLE-TRACK LINE

Track in background has been re-established at official grade. Incline beyond crossover connects sunken track with level on which it was originally built.



RAISING TRACK WITH CONCRETE AND PAVEMENT INTACT

This method, not recommended, was followed in order to save trackwork and pavement which was in good shape when the raise to official grade became necessary.

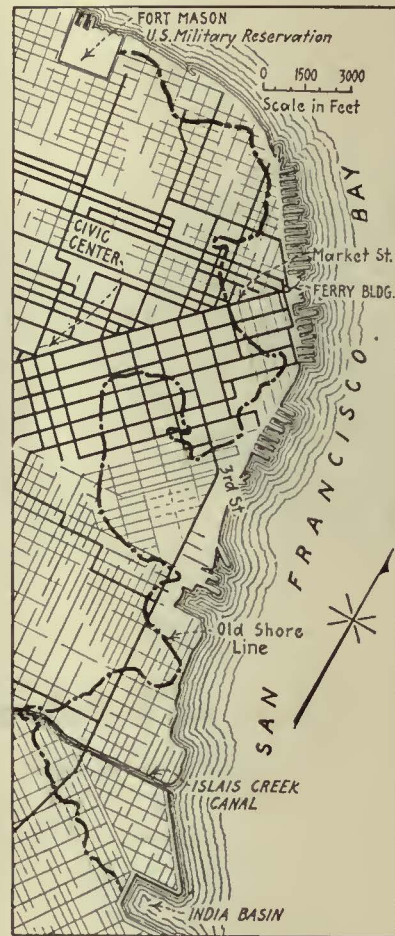
up to grade, the lift being as much as 5.35 ft. at the lowest point. The fill was made of good material and compacted in the usual way. This track has now sunk 1½ ft. below official grade. In sinking a pit which the company recently put down on lower Market Street, no less than five sunken pavements were cut through in excavating to a depth of 10 ft.

For this continually settling foundation the only method believed to be generally satisfactory is the entire reconstruction of the track at appropriate intervals. The practice is to allow the track to settle without any endeavor to maintain or otherwise improve its condition until the time comes for entire reconstruction. In reconstruction the pavement is removed, rails and ties are taken up, and the material used for making the fill is dumped on top of the old ballast. New ballast is provided and old or new rails and ties, if required, are then laid. A finished height of about 2 in. above the official grade is usually made to allow for the immediate settlement.

In one notable case the track and paving were raised intact. This was done to save the paving as reconstruction became necessary at a time when track and paving were in good condition. This method is not recommended. The process is slow and comparatively costly, but a still more serious objection is the impossibility of tamping the fill thoroughly from the sides of the raised track.

Track with paving intact jacked to the new grade is shown in one of the accompanying illustrations. In this case a "permanent" form of track construction had been used—basalt blocks on top of concrete extending down to the bottom of the ties. In raising this track, trenches were first dug along either side of the track and 20-ton jacks were placed against the under side of the rail flanges at intervals of about 20 ft. As new material was shoveled under the raised track it was tamped horizontally from both sides, using 4-in. x 4-in. timbers fitted with handles.

Because the subsidence is at a slow and uniform rate, fairly accurate prediction can be made of the time when a maximum permissible separation of street and building grade will be reached. Endeavor is made to program track and paving work in such a way that as this time approaches no work will be necessary and when the street is regraded new paving and perhaps also new rails can be put down without economic loss. Under these conditions it is considered economical not



MAP SHOWING AREA THAT IS SUBSIDING

All that area between the bay and the old shore line is sinking at the rate of 0.1 ft. per year. Most of this has a soft mud bottom of great depth.

to use a permanent and expensive type of rail foundation such as concrete, steel ties, etc. A short length of track built on trestle has been found most unsatisfactory. The trestle keeps the track at grade satisfactorily, but the paving (basalt blocks are used in that district) is continually sinking away from the track and requires to be removed and replaced on new ballast about once a year. The use of planks over the stringers to support the paving has been considered inadvisable because of the renewal costs on the planking and because there would still be the subsidence of the remainder of the street to make a continually increasing abrupt change of grade on either side of the track. The trestle itself is a necessity to maintain exact grade for the

approach to a lift bridge. Some of the typical grade subsidences are shown in the accompanying profile. Lower Market Street, which was restored to grade in 1907 by raises of as much as 2.86 ft. in some places, is now 1 to 2 ft. below grade again. Lower Clay Street was brought up to grade in 1908 by raises of 2 to 3 ft. and was again required to be raised a foot or more in 1920.

In these soft-bottom areas where the tracks cross sewers or culverts supported rigidly on piles conditions



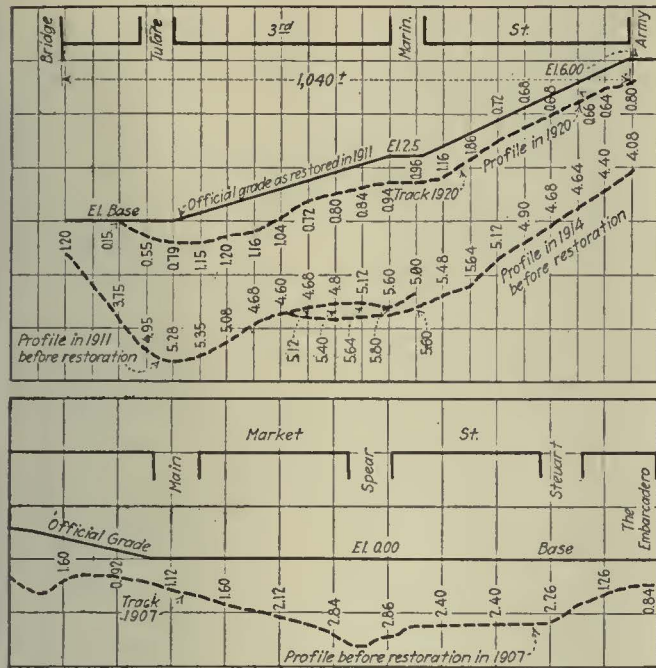
RECONSTRUCTION OF CABLE TRACK IN SERVICE

This track has been raised and back-filled. The difference in level between track and remainder of the street, which has yet to be filled, shows amount of raise, which has been necessary to compensate for the subsidence.



RECONSTRUCTED CABLE TRACK READY FOR CONCRETE

Note the yokes spaced 3 ft. 6 in., which take the place of ties. Wooden forms are built around these yokes for the concrete placed in final construction stage. This track indicates the restored street grade to which remainder of the street will be raised.



SUBSIDENCES ON THIRD STREET AND ON LOWER MARKET STREET

These are typical profiles. In the case of lower Market Street the tracks are now well below the official grade again.

are introduced that cannot be easily remedied. In one case where the tracks cross a box culvert the subsidizing ground on one side of the culvert allowed the track to go down until a difference of 1 ft. in elevation developed within a distance of 20 ft., the rails bending to allow the track to conform to this change. Operation over the track in this condition has continued for about five years.

In another case where a concrete sewer 10 ft. wide underlies the tracks lengthwise, so that part of the tracks are rigidly supported and other parts are on settling ground, uneven settlement has caused the inner ends of the ties on both tracks to rise 2 to 3 in., while the outer ends have sunk an equal amount, thus tilting the tracks away from each other.

CABLE LINE SETTLEMENT CORRECTED BY RAISING STRUCTURE

Re-establishment of grades on the cable lines is quite a different process from that used for the electric lines. The cable railway track is supported on steel yokes embedded in concrete; a construction which could be rebuilt only at prohibitive costs. It has been found possible to raise this structure bodily, however, and as the cars are light the raising is done without interrupting operations. The narrow gage (3 ft. 6 in.) and the fact that heavy equipment is not used make it possible satisfactorily to tamp the back-fill from the sides. Sand is used largely for the back-fill and is kept wet during the tamping. When the side trenches are refilled they are also thoroughly tamped.

In order to avoid danger of cracking the concrete, the cable tracks are raised in sections of not less than 200 ft. After excavating side trenches 10-ton screw jacks are

placed at 8-ft. to 10-ft. intervals under shoulders of the yoke or under the concrete bottom, as may be more convenient. The jacks are rested on pieces of old ties sewed up for this purpose. The first lift is made at least 100 ft. from one end of the section to be regraded, and the maximum lift is kept at this point until jacks are placed for 100 ft. or more in either direction and the desired grade at this central point has been reached with an easy slope in either direction. Work is then advanced in one direction only, always keeping an easy grade ahead of track that has been restored to grade.

The gangs raising cable track consist of about fifteen men and will ordinarily raise about four blocks of single track per month. A track raise of 3 to 4 in. per day has not been found to be detrimental to the concrete of the cable duct. The cable tracks are usually finished 2 in. above the official grade.

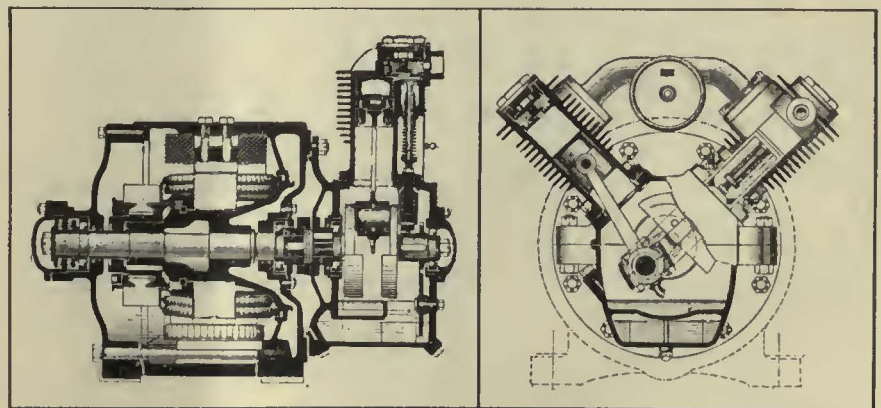
B. P. Légare, from whom material for the foregoing was obtained, is engineer of maintenance of way and construction of the Market Street Railway and has been in charge of all track work done since 1907.

A Light-Weight, High-Speed Motor Compressor

THE department of studies of the unified transportation system in Paris (la Société des Transports en Commun de la Région Parisienne) is attacking several fundamental problems of urban transportation. This was illustrated in the article on an experimental light-weight car appearing in the issue of this paper for Dec. 2. Another result of the researches of this department is a light, high-speed, direct-connected motor-compressor, weighing complete about 420 lb. The accompanying illustrations show the general construction.

The compressor is driven by a 2½-hp., four-pole series motor, operating at full load at 1,100 r.p.m. Its armature runs in ball bearings. The ends of the motor casing are of aluminum.

A flexible coupling connects the motor with the compressor, which has two cylinders, one 2½ in., the other 3½ in. in diameter. These are arranged in "V" at right angles to each other. The inlet valves are controlled by a cam carried on the main shaft. Like the motor shaft, the crankshaft of the compressor is carried in ball bearings. It is claimed that the new compressor is 20 per cent more efficient than a compressor of the low-speed type and 30 per cent lighter. An extended illustrated description of the motor-compressor will be found in a recent issue of *L'Industrie des Tramways, Chemins de Fer et Transports Publics Automobiles*.



LONGITUDINAL SECTION AND CROSS-SECTION OF EXPERIMENTAL MOTOR-COMPRESSOR FOR USE ON TRAMWAY CARS IN PARIS

Budget Control in Boston

All Expenditures Are Controlled by a Budget Prepared Every Six Months and Semi-Annual and Monthly "Controlling Sheets" Are Used in Order to Check Expenditures

ALL expenditures on the Boston Elevated Railway both for capital and operating accounts are controlled by a budget which has proved very satisfactory to the company, one reason being that it enables all operating departments to plan and conduct their work systematically and consequently with the greatest real economy.

For the operating budget the year is considered as a whole and no false feeling of prosperity or of disappointment is caused when the monthly earnings go up or down from perfectly natural causes. This means that the work can be planned more carefully and when once undertaken does not have to be stopped suddenly at considerable loss.

budget is prepared in June and December containing an approximate estimate of the receipts and expenditures for the six months of the following half-year period. In the preparation of this tentative six-month budget the estimated gross earnings are based on the figures for the corresponding period of the previous year with allowances for expected increases or decreases in traffic, changes in fares, etc., and the estimated expenses are based on information secured from the operating departments as to their requirements, taking into consideration wages paid, prices of material, etc.

For this purpose the departments considered are four in number, namely, maintenance, equipment, power and transportation. These estimates are gone over by the general manager in conference with the department heads before the various amounts are allowed. When this has been done, each department head is furnished with a copy of this tentative six-month budget showing the amounts which he is authorized to spend during that period under the various accounts, divided in accordance with the Interstate Commerce Commission method of accounting, with the understanding that he may schedule his work with the view of spending these amounts provided the gross earnings do not fall materially below the estimates. This is given the title of "controlling sheet" and the one for the six months July to December, 1922, is shown in one of the illustrations.

This six-month controlling sheet is followed by individual monthly controlling sheets issued during the last week of the preceding month. Practically the same system is followed in the preparation of this individual monthly controlling sheet except that the estimated expenditures are not the subject of conference between the general manager and department heads, and after this individual controlling sheet has been issued department heads are not required to restrict their expenditures to amounts less than those allowed even though it may be apparent some time during the month that the earnings will fall below the estimate.

This arrangement is for the purpose of giving the department heads as free a hand as possible to carry out their work as scheduled and in the most economical manner.

As each month passes, figures are filled in a column provided on this controlling sheet showing the actual expenditures so that when the accounts are closed for the month the sheet shows in four columns the estimated figures for the month, the allowed figures, the actual figures and the actual figures for the same month of the previous year.

In the monthly controlling sheet for July, 1922, the estimated and allowed figures happened to be the same, but this is not always the case.

There is also furnished to each department head before the fifteenth of each month a statement prepared by the general auditor giving the operating expenses by sources showing the amounts spent by each department chargeable to each account, which

BOSTON ELEVATED RAILWAY					
Controlling Sheet For <i>Estimated Six Months July to Dec.</i>					
	July	August	September	October	November
RAILWAY OPERATING REVENUES					
Receipts from Transportation	2,465,000.00	2,452,000.00	2,382,000.00	2,491,000.00	2,464,000.00
Receipts from Other Railway Operations	4,400.00	4,400.00	4,400.00	4,400.00	4,400.00
TOTAL RAILWAY OPERATING REVENUES	2,469,400.00	2,456,400.00	2,386,400.00	2,495,400.00	2,468,400.00
RAILWAY OPERATING EXPENSES					
Way and Structures	244,250.00	244,250.00	244,250.00	244,250.00	244,250.00
Equipment	222,000.00	222,000.00	222,000.00	222,000.00	222,000.00
Power	774,000.00	774,000.00	774,000.00	774,000.00	774,000.00
Conducting Transportation	833,530.00	833,530.00	833,530.00	833,530.00	833,530.00
Traffic	200.00	200.00	200.00	200.00	200.00
Operational and Miscellaneous	173,000.00	173,000.00	173,000.00	173,000.00	173,000.00
TOTAL RAILWAY OPERATING EXPENSES	1,797,000.00	1,797,000.00	1,797,000.00	1,797,000.00	1,797,000.00
% of Oper. Expenses to Oper. Revenues	72.4%	72.8%	75.3%	71.7%	72.8%
Net Revenues—Railway Operations	562,400.00	562,400.00	562,400.00	562,400.00	562,400.00
TAXES ASSIGNABLE TO RAILWAY OPERATION	122,700.00	122,700.00	122,700.00	122,700.00	122,700.00
Operating Income	439,700.00	439,700.00	439,700.00	439,700.00	439,700.00
NON-OPERATING INCOME	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00
Gross Income	454,700.00	454,700.00	454,700.00	454,700.00	454,700.00
DEDUCTIONS FROM GROSS INCOME					
Rest for leased Roads					
W. M. B. Co.					
W. M. B. Co.—Terminal Subv.					
Other Roads					
Total Rest for Leased Roads					
Miscellaneous Items (Other Railways—Terminal)					
Interest on Unfunded Debt (B. R.)					
Interest on Unfunded Debt (M. R.)					
Miscellaneous Deductions					
TOTAL DEDUCTIONS FROM GROSS INCOME					
NET INCOME					
DIVIDENDS (on Common and on Pref.)					
NET ALLOWING FOR DIVIDENDS					

BOSTON ELEVATED RAILWAY COMPANY				
Controlling Sheet For <i>July, 1922</i>				
	July 1921	Estimated 1922	Allowed July 1922	Actual July 1922
RAILWAY OPERATING REVENUES				
Receipts from Transportation	2,465,000.00	2,452,000.00	2,452,000.00	2,418,250.00
Receipts from Other Railway Operations	4,400.00	4,400.00	4,400.00	4,370.00
TOTAL RAILWAY OPERATING REVENUES	2,469,400.00	2,456,400.00	2,456,400.00	2,422,620.00
RAILWAY OPERATING EXPENSES				
Way and Structures	244,250.00	244,250.00	244,250.00	244,250.00
Equipment	222,000.00	222,000.00	222,000.00	222,000.00
Power	774,000.00	774,000.00	774,000.00	774,000.00
Conducting Transportation	833,530.00	833,530.00	833,530.00	833,530.00
Traffic	200.00	200.00	200.00	200.00
Operational and Miscellaneous	173,000.00	173,000.00	173,000.00	173,000.00
TOTAL RAILWAY OPERATING EXPENSES	1,797,000.00	1,797,000.00	1,797,000.00	1,797,000.00
% of Oper. Expenses to Oper. Revenues	72.4%	72.8%	72.8%	72.8%
Net Revenues—Railway Operations	562,400.00	562,400.00	562,400.00	562,400.00
TAXES ASSIGNABLE TO RAILWAY OPERATION	122,700.00	122,700.00	122,700.00	122,700.00
Operating Income	439,700.00	439,700.00	439,700.00	439,700.00
NON-OPERATING INCOME	15,000.00	15,000.00	15,000.00	14,700.00
Gross Income	454,700.00	454,700.00	454,700.00	454,400.00
DEDUCTIONS FROM GROSS INCOME				
Rest for leased Roads				
W. M. B. Co.				
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NET INCOME				
DIVIDENDS (on Common and on Pref.)				
NET ALLOWING FOR DIVIDENDS				

An article on the forms and classification used in the preparation of the Boston Elevated Railway budget, written by E. M. Flint, assistant to general manager, was published in the issue of this paper for Dec. 25, 1920. The present article will describe methods followed in the preparation of the budget and how the expenditures are checked and controlled. A tentative operating

TYPICAL SEMI-ANNUAL AND MONTHLY CONTROLLING SHEETS USED IN BOSTON ELEVATED RAILWAY BUDGET PRACTICE

affords the departments an opportunity intelligently to analyze their expenditures.

The budget for capital expenditures is made out on a yearly basis with respect to the larger projects and is added to from month to month as the smaller matters come up. The practices of budgeting and controlling the capital expenditures are very similar to those of budgeting and controlling the operating expenditures except that the capital expenditures are not, of course, based on estimated earnings and are therefore followed only to the extent of insuring that the expenditures are kept within the appropriations.

The budget system in practically its present form has been in use since Jan. 1, 1919.

How Money Is Handled by Seattle Street Railway

BY ALLEN B. HIATT

Auditor Department of Public Utilities, City of Seattle, Wash.

THE Municipal Street Railway of Seattle, shortly after its purchase of the Puget Sound Traction, Light & Company system, adopted the use of the auto truck for the collection of money from the carhouses and the distribution of transfers and stationery to them.

The company had followed the slower and more inconvenient method of using an old single-truck street car.

After three years' experience we recently purchased a new chassis (having worn out the old), placed upon it the old body, which we had slightly remodeled, and will continue to use the truck, well satisfied with the results.

Two men, armed, drive the truck to the various carhouses, picking up the money, "lost articles," and inter-department mail to be brought to the office, and leaving stationery and one day's supply of transfers. When the receipts have been checked, balanced and prepared for deposit they are taken to the bank by these two men and the office cashiers.

We find the truck much faster, more convenient and its routing more flexible, while at the bank we can pull up to the curb or to the alley entrance, thus eliminating the blockade of traffic on a heavily traveled street which is caused by the street car method of handling.

Wisconsin Utilities Advertise

A CHECK on the advertising carried in newspapers by the public utilities of Wisconsin during the month of January showed that 9,776 column inches were used in twenty-eight of the forty-two daily papers of the state. The four Milwaukee daily papers carried 5,505 column inches of such advertising and the weekly papers carried 1,237 column inches in addition. This aggregated about ninety-four pages of paid advertising for the month.



STEEL MONEY COMPARTMENT AND INTERIOR ARRANGEMENT. SEATTLE MONEY CAR



The accompanying cuts illustrate how the body is built to fit our needs. A heavy steel tank, opening at the side of the car and placed just behind the driver's seat, extends across the body with a drop-door at each end.

In the tank, which is well secured and locked at all times, is carried all moneys. "Lost articles," stationery, transfers, etc., are carried in the body proper, a shelf being arranged on top of the tank to care for the transfer cases. Seats are placed along each side for the convenience of the cashier; on their daily trips to the banks and are arranged to fold up against the side of the body when not in use. Underneath, at the rear, is a box for spare tires, so placed as to serve for a step. The sides of the body are of sheet metal and the top of agasote. It was designed and built in our shops.

Safety Measures Cut Accidents

They Also Reduce Costs on the Chattanooga Street Railway Lines to 3½ per Cent of Gross Instead of More than Five Times that Amount—A Representative of the Company Gives Particulars

A REVIEW of the safety work of the Chattanooga Street Railway lines through which the percentage of accident costs to gross were reduced from 17.8 per cent to 3.5 per cent in five years is given by J. C. Costello, editor of "Electro Topics" of the Chattanooga system in *National Safety News* for December. An abstract follows:

For several years prior to 1919 the number of accidents occurring on the street railway lines in Chattanooga, and the consequent resulting expenditures, has been constantly increasing, the expense particularly being materially augmented in 1917 and 1918 as a result of a number of serious accidents. The total amount expended on account of accidents reached a maximum in 1918, when as a result of 2,793 accidents in that year and held-over claims from the previous year we expended 17.7 per cent of our passenger revenue. In one instance, the records show an expenditure for a single month equivalent to 30 per cent of the passenger revenue.

Late in 1918 the conclusion was reached that the only salvation lay in a very thorough organization of all employees for the purpose of bringing home to them the need and benefits of intensive accident prevention work. After casting about for several months for some effective method of procedure the "Chattanooga plan" of safety contests was finally evolved from suggestions received from our own employees. The contests have been the very heart of the company's safety work since their inception. Contest No. 8 is now in progress and our employees seem even more enthusiastic in the present contest that they were in the first one.

THE PLAN OUTLINED

The plan, with its many novel features, may be summarized as follows:

Members of the various operating departments, excluding superintendents and foremen, are eligible to participate. The contestants are divided into six teams, each with a captain and two lieutenants. Contests are of four months' duration; to be entitled to a prize award each member must be engaged in active company work for at least 720 hours during the four months period. The rules require that all accidents, no matter how slight, must be reported. In the cases of cars operating on the road, motormen and conductors are required to make out separate reports. Every untoward incident, such as a controller flash, disturbance or ejection of a passenger, the frightening of an animal resulting in an accident, a trolley break, broken glass, etc., is classed as an accident. Severe penalties are meted out for failure to make out reports or for willful concealment or misrepresentation of facts in connection with an accident. The winning team divides a cash prize of approximately \$600 equally among its members, and badges of merit are awarded men of other teams who have earned perfect records. Appropriate recognition is also given those who establish exceptional records in more than one contest.

The total number of accidents in 1917 and 1918 was 2,291 and 2,793 respectively, but the actual number was no doubt considerably higher, since the rules cover-

ing the classification and reporting of accidents at that time were not as strictly defined or enforced as at present. As compared with a monthly average of 233 for 1918, all classes of accidents were reduced to a monthly figure of 182 in 1919, 201 in 1920, 151 in 1921, and 123 for the first half of this year—in other words, an average of 4.1 per day now as compared with 7.8 per day in 1918.

Naturally a big improvement was noted in 1919, the first year of intensive safety work. As compared with 1918, the number of employees' accidents was decreased 44 per cent, and the number requiring medical attention 64 per cent. The total cost of employees' accidents, including lost time, payment for injuries and medical attention, decrease 84 per cent, this saving alone being twice the entire expense of carrying on all safety work, including the cost of contests.

For the same period the total number of all accidents was decreased 22 per cent. The number of claims filed decreased 56 per cent. The number of suits filed was reduced 59 per cent, and a reduction of 56 per cent was effected in the total costs on account of injuries and damages. The total accidents for 1920 was greater than in 1919. This does not mean that the results were not as good as for the previous year, but is really due to the fact that the safety plan had been better established by 1920 and more complete accident reports were being received from the men. The cost of accidents increased approximately \$11,000 in 1920 over 1919 also, but this was caused by one single serious accident in January of that year which cost the company over \$21,000.

The continued decrease in the number of accidents meant, of course, that more perfect records were made by employees in successive contests. This fact is readily shown from a summary of the various charges assessed against all six teams in each contest, together with the records of the winning teams. These figures are as follows:

Contest	Total Charges All Teams	Total Charges Winning Team
1	1,364	206
2	742	114
3	886	133
4	817	113
5	596	82
6	587	84
7	472	65

Just what the reduction in accidents has meant in the amount of money required to be paid out for injuries and damages is readily apparent from a glance at the following figures:

Year	Accidents	Cost	Passenger Revenue	Per Cent Accident Costs to Rev.
1917	2,291	\$120,010	\$672,646	17.8
1918	2,793	152,604	860,275	17.7
1919	2,182	66,356	857,372	7.7
1920	2,521	77,205	1,084,653	7.1
1921	1,817	42,050	978,202	4.3
1922—six months	741	16,152	456,272	3.5

This picture would not be complete without some mention of the cost of actually carrying on the safety work itself. Data on this subject will be found to be equally as surprising, as may be noted in the following summary which gives the total annual expenditures since 1919: 1919, \$4,432; 1920, \$4,757; 1921, \$5,018; 1922—six months—\$1,725.

These figures include the cost of preparing and printing car cards, safety bulletins, booklets, etc., the ex-

pense of publishing a monthly employees' magazine, membership dues in the National Safety Council and the expense of two delegates to the Annual Safety Congress, the costs of two entertainments and banquets staged each year at the conclusion of the safety contests and the cash prize awards to the winning teams. The \$5,018 expended in 1921 was distributed as follows: \$1,200 for cash prizes, \$600 for entertainments, \$1,100 for house organ and a like amount for safety cards, bulletins, etc., \$450 to cover National Safety Council expense, \$350 for payroll account, covering time of men attending safety meetings, and the balance for miscellaneous expenditures.

SAFETY MEASURES FOUND EFFECTIVE

In the early stages of our campaign to eliminate accident hazards, we soon realized that success could only be attained by the co-operation of the public as well as of employees. The first appeal was made through car cards in the form of a series of "Don'ts." These cards embodied cartoons depicting various hazardous practices of the pedestrian, motorist, careless child, and others, with advice on how to avoid accidents. The cards were changed at intervals and were subsequently superseded by a set carrying simple safety messages, unillustrated, which are still in use.

The latest innovation along this line and one that has produced much favorable comment is the carrying of a safety slogan on the dashboard of the car. About twelve trolleys are so equipped, no two carrying the same message, and it is the intention to increase the number to twenty. Various color schemes have been employed in working up the different signs and they have attracted the prompt attention of both motorist and pedestrian. One, containing the admonition to motorists not to cut-in in front of street cars, has already brought about a noticeable improvement in this practice. Other methods of impressing the public mind with the need for safety have been attempted through talks to the school teachers and the disseminating of literature among the school children.

To maintain the interest of employees, general safety meetings are held once each month and a safety committee, comprising about forty members, meets twice each month, at which time suggestions are received for improving track, overhead lines, condition of equipment, etc., and the elimination of any unsafe practices. It is interesting to note that over 900 suggestions have been favorably acted upon since the inauguration of these meetings. Bulletin boards featuring the literature of the National Safety Council are also maintained at various locations on the property to keep up interest in the movement.

Like the safety contest idea, which, after first starting among the platform men, subsequently spread to the other operating departments, every effort has been made to insure safe working conditions in every department of the company. Numerous safeguards have been provided for the various high-speed machines in the wood-working department to prevent operators from losing a finger or hand; rubber gloves and safety belts are insisted upon in the line department; every track gang carries a first aid kit in its tool box. The automobiles operated by the company are inspected at regularly scheduled times in order that any defects may be corrected; the same applies to street cars, which are inspected on a mileage basis. A monthly fire inspection is made of the entire property. Cleanliness in the various offices, shops and yards is required at all times. Every week is "Clean-Up Week" in the Chattanooga organization.

During the fall of last year, an added safety feature was the employment of a man to conduct among the workers practical demonstrations of the prone pressure method of resuscitation from electrical shock. Lessons were also given the members of the city police and fire departments and to the Boy Scouts. At least once during the past year this practice was directly responsible for saving the life of a lineman who came in contact with a 2,300-volt current.

This single instance of having saved one man's life has amply repaid the company for all the time, money and energy devoted to the teaching of safety principles and practices.

Accidents never happen, they are always caused. Carelessness on the part of some one is always responsible for the untold misery and life-long suffering that we see about us every day. Safety, on the other hand, is something which, in the abstract, costs nothing, its art is easily acquired, and it pays for itself over and over again.

Saskatoon Snow Problems

THE accompanying illustrations give an idea of some of the snow difficulties encountered along the electric lines of the Saskatoon Municipal Railway, Saskatchewan, Canada. A portion of the road serving the Canadian Pacific Railway shops at Sutherland, 5 miles from Saskatoon, is shown as it appeared last winter. The lines run across the level prairie, but owing to the continued drifting which occurs, a wall of snow was created on both sides of the track for a distance of more than a mile. The snow plow and sweeper shown at work was built in the railway company's shops. The longest period that this line was tied up last winter was a day and a half.



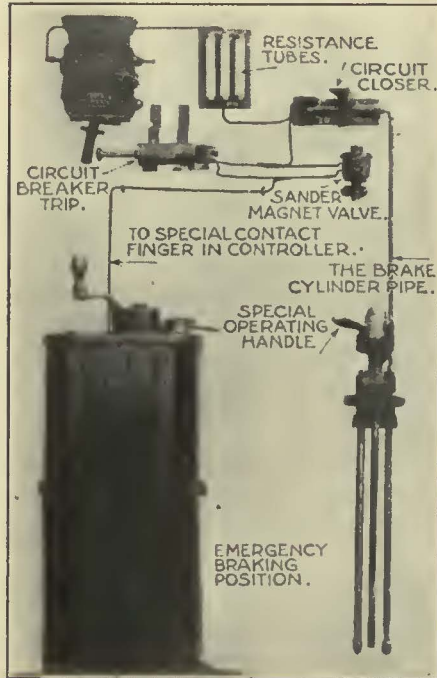
AT LEFT, BUCKING THE SNOW WITH A SNOW PLOW. AT RIGHT, HIGH SNOW WALLS ON EITHER SIDE OF THE TRACK

Safety Device with Dead-Man Air-Brake Valve Handle

BY F. L. HINMAN

Assistant Superintendent of Rolling-Stock and Buildings
Philadelphia Rapid Transit Company

FOR three months past we have been operating in Philadelphia several cars equipped with simple apparatus designed primarily to improve the safety of operation, a feature being a "deadman" brake-valve handle.



ESSENTIAL EQUIPMENT USED IN THE "SIMPLEX SAFETY SYSTEM"

apparatus is the special air-brake valve handle. This fits over the stem of the regular air-brake valve. It automatically goes to emergency position when released, thus providing the "deadman" feature. It is rotated to this position by a coiled spring, after being unlatched by another coiled spring in the top of the bonnet which tilts the handle upward for this purpose. In the latched position the handle operates like one of the ordinary type. After being unlatched, and thus taking the emergency position, the device may be relatched by moving the grip to the emergency position and depressing it.

Besides the special brake-valve handle, the equipment comprises a circuit closer, a circuit-breaker trip and a sander magnet valve. The circuit-closer is a small air cylinder connected to the brake-cylinder air line and

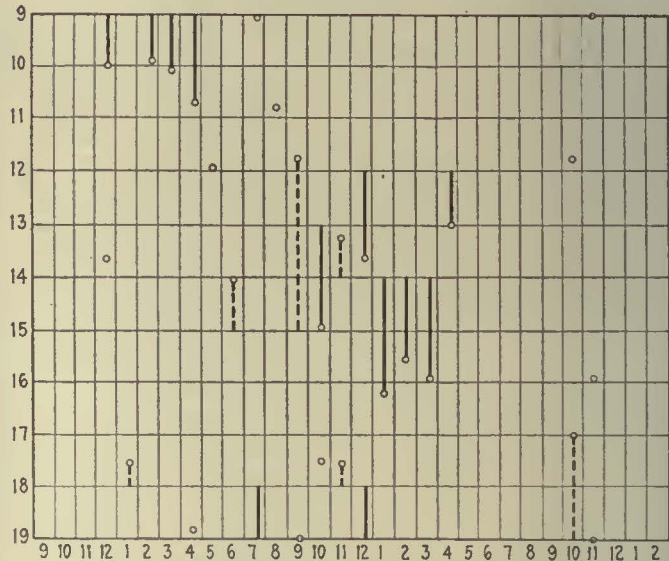
carrying on its piston push rod a quick-break head which makes connection between two phosphor-bronze springs at each brake application. The circuit-breaker trip is a cylinder containing a plunger which is normally latched against the pressure of a spiral spring. This latching lever is tripped by the pull of a magnet on the rear end of the cylinder. The sander magnet valve is simply an electrically operated valve supplying air to the sand traps.

The above aggregation we have entitled "The Simplex Safety System." Patents on the new features have been applied for and in due course provision will be made for manufacturing the essential pieces.

Rapid Checking of Headway Recorder Records

THROUGH the use of a sheet of celluloid as a template, J. R. Ong, transportation engineer of the Georgia Railway & Power Company, saves appreciable time in securing a check of actual schedule against headways on the railway lines in Atlanta.

The company carefully checks its schedule times and running times, as described in the issue of this paper for May 6, 1922, and in this work uses a Nachod headway recorder, which is moved from route to route as

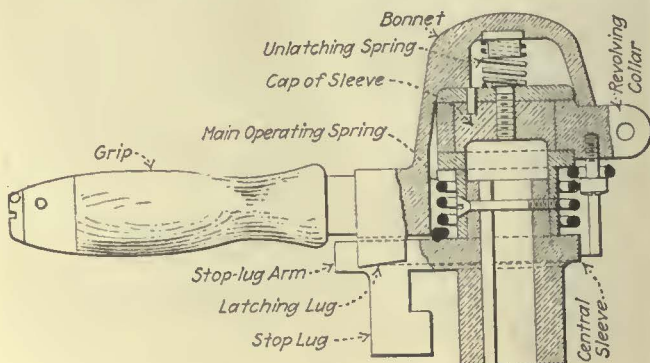


PORTION OF HEADWAY RECORD SHOWING ACTUAL TIME OF CARS, CHECKED AGAINST SCHEDULE TIME

necessity indicates. The report sheet taken out of the recorder is placed under a piece of celluloid on which the schedule headways are indicated by holes which have been slightly countersunk and then the countersunk portions blackened by ink so that the holes will show more clearly. After the master sheet or template has been laid over the actual record, a pencil point is pushed through each hole in the celluloid. Next the dots representing the planned and actual arrival of the car are joined up by a blue line, if the car was ahead of time, and by a red line, if the car was behind time.

In the reproduced section the blue line is represented by a broken line, and the red by a solid line. The complete record can be checked up within half an hour.

The company has also made a change in the arrangement of hours on the sheet, beginning at 5 a.m. instead of 9 a.m. and resetting the clock movement accordingly. These hours are put on the sheet with a rubber stamp.



CROSS-SECTION OF THE SPECIAL BRAKE-VALVE HANDLE

Electric Locomotives for Japanese Government

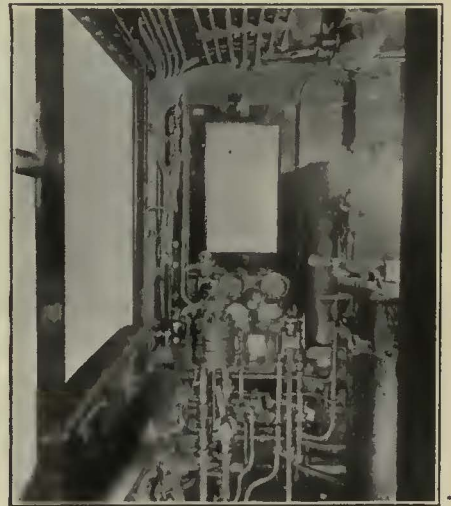
They Are Equipped with Motors Specially Designed for Narrow Gage, and Have High-Speed Circuit Breakers and a New Form of Electro-Pneumatic Control—They Are for 1,500-Volt, D.C. Operation

ON THEIR way to Japan are two locomotives ordered some time ago for the Imperial Government Railways of Japan from the General Electric Company and built at the G. E. Erie Works. These will be tried out on the Tokyo-Yokohama line, which was electrified in 1915 at 1,200 volts direct current. The government plans in future installations, however, to use 1,500 volts.

The locomotive is of the box-cab type, equipped with four GE-274 750/1,500-volt motors, geared for a maximum speed of 40 m.p.h. Its total weight is 132,000 lb., all on driving axles, and it is capable of exerting a tractive effort of 17,700 lb. on the one-hour rating. The

ating cab, energize the magnet valves of the pneumatically operated contactors, which open and close the main motor circuits. These contactors are closed by air pressure and opened by a heavy spring acting against the pistons. Ten control steps are provided with four motors in series and eight steps with the motors in series-parallel.

Another important feature of this equipment is the high-speed circuit breaker, which is connected between the trolley and the main part of the locomotive equipment. Under normal operating conditions this circuit breaker is closed automatically on the first point of the master controller; it then remains closed unless tripped by an overload or short circuit or by momentary loss of the control circuit voltage. After being tripped for any reason, the breaker is again reset upon the first point of the master controller. Under normal operation, however, the high-speed circuit breaker does not open with the return of the controller to the off position.



AT LEFT, 1,500-VOLT, 1,040-HP. LOCOMOTIVE FOR TRIAL USE OF JAPANESE GOVERNMENT RAILWAYS. AT RIGHT, INTERIOR OF OPERATING CAB, SHOWING LEFT-HAND DRIVE

continuous rating gives a tractive effort of 17,400 lb. at 22 m.p.h., with 1,500 volts on the trolley. In addition to the 1,500-volt rating the locomotive can be operated at 1,200 volts at a somewhat reduced capacity, and provision is made for operation at 600 volts direct current by the throwing of a commutating switch which connects all four motors in parallel. They are permanently in series for 1,500-volt operation. Protective devices are supplied to prevent damage due to accidental contact with the 1,500-volt trolley when the commutating switch is thrown to the 600-volt connection. The leading dimensions of the locomotive are as follows:

Length over all	37 ft. 2 in.
Length of wheelbase	26 ft. 0 in.
Rigid wheelbase	8 ft. 6 in.
Height over pantograph (locked down)	12 ft. 10 in.
Diameter of wheels	42 in.
Gage of track	42 in.

The GE-274 motors were designed especially for this locomotive and are the largest so far constructed for a 42-in. gage track. Each motor rates 260 hp. on 750 volts, and is insulated for operating two in series on 1,500 volts. The motors are arranged for ventilation by means of external blowers.

One of the most interesting features of the equipment is the new electro-pneumatic type of control known as Type PCL. Two master controllers, one in each oper-

This circuit breaker has no mechanical latches or triggers, but is tripped electro-magnetically. This construction makes for durability and permanence of calibration.

To protect the locomotive motors against damage due to overload, an overload relay is provided, which is so connected that in case the motor current exceeds a certain predetermined value the relay contacts open the holding circuit of the high-speed circuit breaker, which then opens and thus relieves the overload.

For collecting the 1,500-volt current, two slider pantograph trolleys (one a spare) are provided having a range of 7 ft. from minimum to maximum height. These pantographs are raised by admitting air to a set of cylinders and are held against the wire by springs, which are in turn held under tension by the compressed air in the cylinders. The contact elements consist of easily renewable copper wearing strips. A hand pump supplies compressed air for raising the trolleys for initial operation when there is no air pressure on the locomotive.

The control current is provided by a dynamotor arranged to supply 750 volts for the low-voltage control circuits and lights. In conjunction with this dynamotor there are two air compressors designed for 750-volt operation, but doubly insulated. The middle point of the air compressor circuit is connected to the mid-

voltage point of the dynamotor to insure equal division of the load between the two compressors. The two blower motors for ventilating the traction motors are also designed for 750 volts each and are doubly insulated.

In the engineer's cab the master controller is located on the left side of the cab to conform to the practice in Japan of running to the left instead of the right.

Elevated Track for Underbody Maintenance

IN MOST cases the amount of rolling stock used by electric railways has increased in a greater proportion than shop facilities. Many roads are doing inspecting in yards adjacent to the shop. Where work has to be done underneath the car body a pit is almost



ELEVATED YARD TRACK FOR UNDERBODY CAR REPAIRS

a necessity. A suggestion as to how tracks can be elevated to provide for outdoor work which would otherwise require a pit is shown in the accompanying illustration. This elevated track is in the yards of the Indiana, Columbus & Eastern Traction Company at Springfield, Ohio, and good use is made of it in taking care of interurban car repairs.

New Cars of San Francisco Municipal Railway

THE San Francisco Municipal Railway has placed in service twenty small center-entrance cars built by the American Car Company. A sample car of this type was placed in service in the early part of 1921 and was described in the *Electric Railway Journal* for Jan. 29, 1921. The cars now placed in service are of the same type. A single-truck car with center entrance is somewhat of a novelty when compared with the general type of cars now being built. The San Francisco cars are but 29 ft. 10 in. over bumpers and have a seating capacity of thirty-two. Brill Radiax trucks are used. The



SAN FRANCISCO MUNICIPAL RAILWAY'S CENTER-ENTRANCE CAR

PRINCIPAL DIMENSIONS AND DATA OF SAN FRANCISCO MUNICIPAL CARS

Length over bumpers	29 ft. 10 in.
Maximum width over window sills.....	8 ft. 8 1/2 in.
Height from rail over trolley board.....	10 ft. 2 7/8 in.
Truck wheelbase	12 ft.
Seating capacity	32
Weight, complete	26,200 lb.
Type of truck	Brill "Radiax"

underframe is constructed of steel commercial shapes and plates, and the upper framing, corner and side posts are of oak. The outside sheathing is No. 14 gage steel and the letterboard No. 10 gage steel. O. M. Edwards Company's trapdoors and steps are used. The accompanying table gives some of the principal dimensions and data.

Other parts of the equipment include Hunter illuminated destination signs, Garland B2 exhaust ventilators, Farraday push button signals, and Rico hand straps. The car has both air and hand brakes. The air brakes are furnished by the Westinghouse Traction Brake Company and the hand brakes are the National Brake Company's Peacock standard type. Type C Eclipse life-guards are provided. The trolley catchers are Ohio Brass Company's, and Golden Glow headlights are used on these cars.

Simple Brakeshoe Hanger

THE accompanying illustration shows a new type of brakeshoe hanger which is being marketed by the National Safety Devices Company, Waterloo, Iowa. It consists of a flat spring which connects the upper casting of the brake head with the truck frame. It can be used either for inside or outside hung brakes and consists of but five parts, the upper casting, brake head, flat spring steel hanger and two short bolts. This is about one-third the number of parts required for other hangers. In addition to the fewer parts which are necessary, the manufacturers claim that a greatly reduced maintenance cost and even wear on brakeshoes will result from the use of this simplified hanger.



Small Size Insulator Brought Out

A NEW and small sized insulator has been brought out by the Ohio Brass Company, Mansfield, Ohio. It is 3 1/2 in. long, 3 1/4 in. in diameter, and has a half-inch hole for stranded wire. It is made of high-tension wet-ware porcelain, and due to the X



SMALL SIZE INSULATOR

shape has a very long leakage path. This insulator is designated by the manufacturer as type XH.

Letters to the Editors

Railway Publicity in Australia

NEW SOUTH WALES GOVERNMENT RAILWAYS & TRAMWAYS

SYDNEY, Sept. 19, 1922.

To the Editors:

The article in the July 1 issue of the *Electric Railway Journal*, describing the operations of the advertising section of the American Electric Railway Association, has been read with considerable interest here in the mother state of the Australian Commonwealth. Perhaps a little information of the growth of the publicity idea in Australian railway management will be of similar interest to readers of the *Electric Railway Journal*.

It will need to be emphasized first of all that the Australian railway systems are all government-owned and state-controlled. In New South Wales both the railway and tramway (street car) services are state-owned. They are administered by a board of commissioners who are vested with arbitrary powers by a special act of parliament, thus removing the control of what has grown into a huge industry from anything in the nature of political patronage. Some idea of the size of the New South Wales railway and tramway systems will be gleaned from the fact that in the financial period ended June 30, 1922, the total earnings amounted to £18,823,154 sterling (about \$94,000,000). The total working expenses were £14,691,918 (nearly \$71,000,000), the difference between these two amounts, £4,691,236 (nearly \$23,000,000), being paid into the consolidated revenue of the state to assist in carrying the national debt.

Being state-owned, the point is continually emphasized that the railways and tramways "belong to the people." This, in its turn, has meant the creation of a large body of keen critics of railway administration. There are so many people really, especially people entirely untrained in railroad work, who think they could do the job very much better if they only had the chance. There, in a word, is the reason for the establishment of a publicity office; and there is, at the same time, a permanent and ever-varying field of operations for the publicity officer.

It may be that some time in the future the commercial side of the publicity department—the advertising section—will become associated with the new scheme. Up to date, however, the publicity office has been entirely concerned with the work of disseminating reliable and up-to-date information about the operations and administration of the services. In addition to replies to criticism and complaints which find expression in the public press of the country, the office is continually engaged in the preparation of up-to-date statistics and the compilation of valuable information with regard to every aspect of railway work and administration.

The article in the *Electric Railway Journal* declares that the "most constructive work done by the advertising section of the American Association has been that of giving electric railway news a real standing in the papers and periodicals of the country." It can be confidently asserted that the same desirable result has been achieved by the publicity office of the New

South Wales Railways & Tramways Department. Practically the entire press of the country now receives with avidity the information which is sent out in a stream of daily communications from the publicity office. When this work started it was face to face with a blank wall of popular ignorance of railway affairs, and particularly of railway finance. Evidences of serious misconceptions of these things are now comparatively rare.

The importance of educating the public mind on these matters may be gaged from the fact that the chief commissioner of the New South Wales railway and tramway services controls more than 50,000 employees, which means that the railways and tramways constitute an industry embracing one-tenth of the entire wage-earning population of the state.

Attached to the publicity office of the New South Wales railways and tramways is an information bureau. The business of the staff of this bureau is to have in readiness, available for use at a moment's notice, up-to-date and reliable information and statistics in regard to railway and tramway operations, not only of our own systems, but also of the systems of other states of the commonwealth and of other countries of the world.

A similar experience to that indicated in your July issue in regard to the reliability of the articles, the statistics and general information supplied to the press, has been realized here in New South Wales. A plain intimation has been made to the entire newspaper-reading population of the state, and continually emphasized, that the state-owned railway and tramway administration has nothing to hide from the people, and is prepared at all times to supply the fullest information to those who are seriously concerned in the administration of the commissioners. This has had a most signal and beneficent effect. We invite criticism, but we say to all our critics: "Get the facts first; we will supply you with the facts if you will ask for them." The effect of this policy might be easily imagined. Without pursuing the subject further, it might be confidently asserted that the idea of a publicity office, attached to the various Australian commonwealth railway and tramway systems, will shortly become an integral part of the administration of these huge public concerns.

THOMAS CROUCH,
Publicity Officer.

Appreciates Assistance of Electrical Press

THE SOCIETY FOR ELECTRICAL DEVELOPMENT, INC.

NEW YORK, Dec. 19, 1922.

To the Editors:

At the meeting of the directors of the society, held at headquarters on Nov. 25 last, the assistant to the president, in his semi-annual report, called attention to the very excellent co-operation that the society is receiving from the electrical trade papers.

On motion, duly seconded and carried, the directors instructed me to convey to you their appreciation for the effective way in which you are bringing to the notice of the industry the work the society is doing. They further instructed me to express the hope that we may be favored with a continuance of your whole-hearted co-operation and to assure you of their desire that the society work always for the best interests of the industry.

J. SMITON, JR., Secretary.

Electric Railway Publicity

Devoted to How to Tell the Story

Selling Rides by Advertising

BY CLIFFORD A. ELLIOTT
Cost Engineer Pacific Electric Railway,
Los Angeles, Calif.

THE Pacific Electric Railway's interurban lines, of more than 1,100 miles of track radiating out of Los Angeles as far as 70 miles and serving some fifty-seven cities in four counties in southern California, have innumerable points of interest for the large number of tourists who yearly visit this section of the state. It is not only the policy of the company's passenger traffic department actively to interest these tourists in the many attractive points of interest on the company's lines, but it is also the aim to attract the permanent residents of the various communities to visit such attractions. These attractions consist of resorts operated by the company or those operated by others conveniently reached by the company's lines.

In the summer season the large volume of travel tends to move to the many beach resorts located on the company's lines, while during the fall, winter and spring season the travel tends to move to the foothills, from which points of vantage travelers in large numbers move in numerous hiking parties to and from the wonderful mountains available for such purposes. In the large ranges of mountains located inland from the Pacific coast are operated many mountain resorts, which are a large attraction for vacationers during the summer season. Some of these resorts are open the year round, particularly the company owned and operated resort located 1 mile above sea level on Mount Lowe. This trip by trolley is nationally known.

In interest of attracting travel to the many advantageous points for hiking among the mountains, the passenger traffic department circulates a twelve-page attractive folder on hiking. The interior section of the folder—17 in. x 24 in.—carries a very comprehensive detail map, showing the location of all the government trails, Pacific Electric lines, resort and mountain camp sites, various canyons, mountain ranges and other valuable information for the use of hikers.

Attractive lithograph cards are placed in wooden frames inclosed in glass, which feature the most important points of interest on the company's lines. Two sizes of cards are used. One 10 in. x 26 in. for small



HOW RIDE-INDUCING ADVERTISEMENTS ARE MOUNTED IN THE CARS

types of cars; the other size being 12 in. x 28 in. for large types of interurban cars. The cards are printed oversize with margin in order that they may be cut down to fit the particular frame in the cars in which they are displayed. In displaying these cards eight frames are available in the majority of the cars. One of the illustrations shows the position of the display frames in the cars. Four of the frames are in the smoker section and four in the other section of the car. This allows two frames to each end of each section so that a prominent view of the cards is always had, whichever way seats may be reversed for the car movement. The Pacific Railway Advertising Company rents the upper or roof section of all the company's cars for interior car advertising, displaying standard 10-in. x 20-in. cards held in place by standard metal containers.

However, the company reserves for its own use the car end sections, which are fitted with a special type of frame located at the right and left sides of the car doors, and easily observed by the traveling public due to their convenient location. These cards are changed every three to six months, whenever they become dirty; also the type of the card is changed from time to time with a view of getting the subject fresh in the public's mind from another angle. In previous



years some of these display cards indicated the rate of fare for reaching the various points of interest, but of late these fares have been omitted due to occasional changes in passenger rates, elimination of war tax, etc.

The frames are made of 3/4-in. molding fixed in place by two wood screws in each of the four sections that go to make up the frame. This type of frame permits its easy removal for renewing the display cards.

"The Street Car's Carpet"

THE material that goes into a street railway roadbed from earth to surface paving was illustrated as a feature of an exhibit used by the Los Angeles (Calif.) Railway in the Pageant of Progress and Industrial Exposition held in that city recently.

The roadbed construction was set in a box 8 ft. long and 6 ft. wide with a heavy glass at one end to show a cross-section. A top view showed the roadbed graduated down from surface paving to concrete sub-paving, the rail, ties, ballast, tile drain and earth. A large poster at the back of the box headed, "The Street Car's Carpet," was marked in squares, and each square was devoted to one of the articles in the track exhibit, such as rail, ties and ballast. Ribbon streamers connected

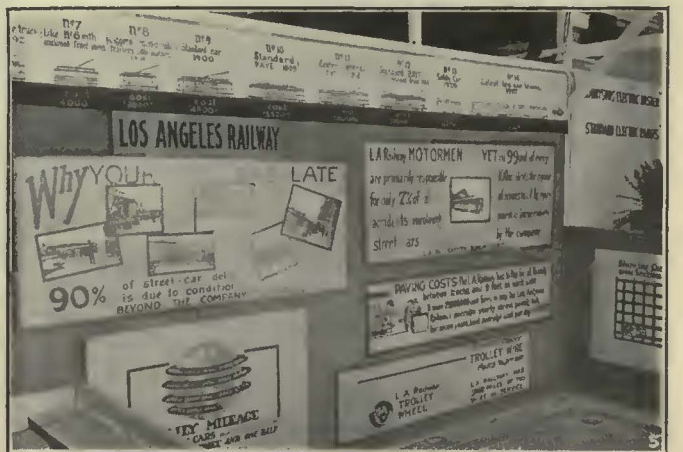
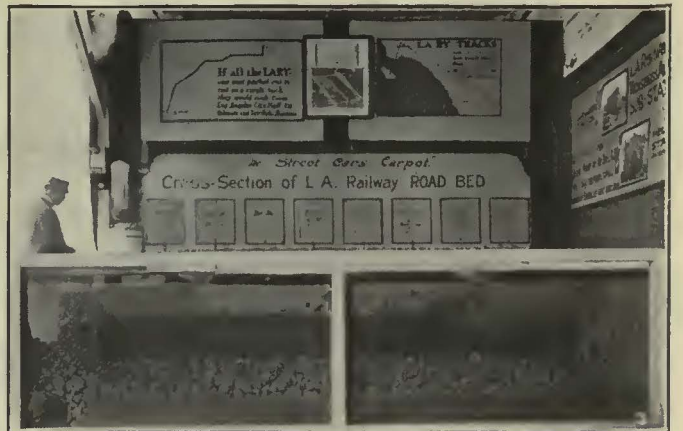
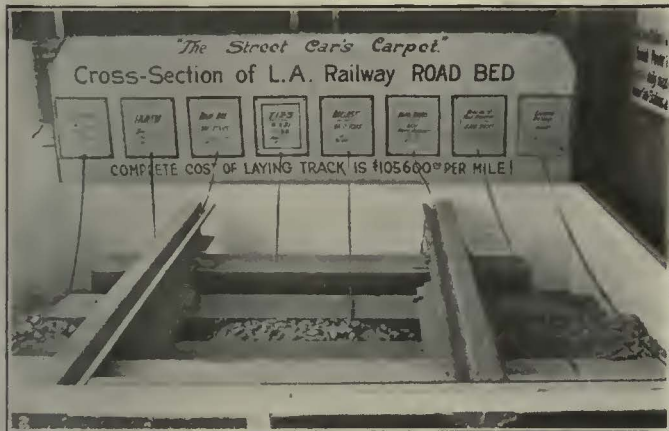
the articles with the data on the poster, showing the amount of the various articles used in laying 1 mile of track. All figures were for double-track construction.

A cloth strip 20 ft. long occupied the full length of the booth with a "historical parade" of street cars used in Los Angeles from two-mule cars to two-car trains. The poster showed the years the various types served the city and the cost.

A poster that attracted considerable interest was headed "Why Your Car Was Late." This poster was made up of photographs of traffic blockades caused by broken-down trucks, street repair work and other causes beyond the control of the company. These pictures were procured by having a photographer ride on an emergency auto for a day.

Other posters advertised the safety records of the company, the number of cars in service at various times, right and wrong way to board a car, and urged passengers to avoid delay by having correct change. A trolley wheel and piece of trolley wire attached to a poster showed the size of these articles and the number of miles of wire used, and its cost.

Two men were at the booth at all times to explain details of the exhibit and to distribute literature.



No. 1—FRONT VIEW OF LOS ANGELES RAILWAY EXHIBIT IN PAGEANT OF PROGRESS. No. 2—DETAIL OF TRACK CONSTRUCTION EXHIBIT No. 3—CROSS-SECTION OF TRACK CONSTRUCTION EXHIBIT. NOS. 4 AND 5—CORNERS OF LOS ANGELES RAILWAY EXHIBIT

Kentucky Men Discuss Public Relations

A Meeting of the Kentucky Association of Public Utilities at Lexington on Dec. 12 Was Well Attended—All Classes of Utilities Were Represented

APPROXIMATELY 180 delegates registered at the meeting in Lexington on Dec. 12 of the Kentucky Association of Public Utilities. This is the seventh annual meeting held by the body, which represents all classes of utilities, and most of the addresses and papers related to the need of establishing good public relations. The principal paper relating to traction matters was presented by James P. Barnes, president of the Louisville Railway, whose topic was "Internal Public Relations," and was based on the idea that the inside working of an organization must be right before it can develop its outside relations correctly. An abstract of this paper appears elsewhere in this issue.

Sessions were held both in the Phoenix Hotel and at the University of Kentucky. In addition, there was a banquet on Monday evening at the Lafayette Hotel for those delegates who arrived on that day. The hosts were the officers of the various utility companies in Lexington.

The session on Tuesday morning opened by an address by the president, L. B. Herrington, vice-president and general manager Kentucky Utilities Company, Louisville. An abstract follows:

PRESIDENT'S ADDRESS

In his address Mr. Herrington pointed out that a year ago the utilities of the state were still suffering from the consequences of the war, but confidence in an early and complete recovery permeated last year's meeting. Scarcely was the meeting over, however, before the coal strike and the rail strike came, retarding recovery, but the way in which the utilities gave service during those trying days will be borne in mind by the public.

In spite of all that has been said and done, a considerable portion of the public has an opinion of utility companies which is not flattering. They will never be able to get all of the people on their side, but if they continue to take all of the people into their confidence, give good service, charge reasonable rates and give customers an opportunity to become partners in the enterprise, the utilities will gain the respect, confidence and good will of the large majority of people. Without this good will, capital for necessary utility extensions cannot be secured, and a community cannot grow unless its utilities are healthy and growing.

A utility gives more than it takes out of a community, and if a part of its capital is furnished locally, even the return on that part of the capital remains to build up that community. During the past year some of the utility companies in the state have conducted successful customer ownership campaigns, and this plan is recom-

mended to those member companies which have not tried it. Further support of the work of the publicity bureau was also urged.

For the first time in the history of the association, women have a place on the program. They can contribute much toward a better understanding between the utility companies and the public. They have shown an aptitude for handling successfully several branches of the electrical business. They invest in the utility securities and are among the largest users of their service and are the molders of sentiment in their homes and in their communities. The women can be reached better through the women in the industry than in any other way.

SECRETARY'S REPORT

E. F. Kelley, secretary of the association, reported that forty-seven corporation and associate members were represented among the 178 delegates registered. A news service bulletin is issued twice a month and has a circulation of nearly a thousand copies, of which 350 go to Kentucky newspapers. The remainder go to the utility companies, public officials and others. Testimony to the interesting character of the material in this bulletin has been received. Cordial relations have been established with the press by letting it be known that the Bureau of Information is always ready to give out the facts about any utility event, whether they are favorable to the company or not. Arrangements have been made for speeches before civic organizations on utility topics on request, and many members of the association had spoken. The bureau operated last year on a budget of but \$3,600, of which \$2,400 had to be spent for the bulletin.

"THE PUBLIC SERVANT"

Donald McDonald, vice-president and general manager Louisville Gas & Electric Company, in the paper on "The Public Servant," said that the lawyer or judge who coined this expression to describe utility companies performed a real service, both to the companies and to the public. The relation of master and servant is older than written history, and it is interesting to note that the oldest codes of Babylon and Leviticus enjoin on the servant diligence, honesty and efficiency, but on the master justice, kindness and intelligence. Men often boast of how cheaply they bought their goods, but never of the fact that their servants are underpaid or underfed. Nevertheless men do sometimes boast that in their city the street carfare is 5 cents, although they know that the actual cost is more than that. The speaker thought that a better understanding is coming about. The rôle of public servant is an honorable one. It is desirable that the utility should take care to be a good serv-

ant, and the municipality should take care that it should be a good master.

NEWS IN ITS RELATION TO PUBLIC UTILITIES

In a talk on this subject Brainard Platt of the *Courier-Journal* and *Louisville Times* referred first to the greater willingness at present of utilities to give the newspapers information, even if not always favorable. He described news as: "That characteristic of any happening which gives to it an appeal beyond the circle of those immediately concerned," and pointed out that an item which might be news for a weekly in a town of a few thousand population would not be a news item to a daily paper in a city of the first, second or third class. The former might like to know when a new motorman was put on the interurban that passes through the town. The paper in a big town is interested only when the motorman serves for a long time without an accident and perhaps receives a medal for such service. The big activities of the utilities are also news, such as extension of facilities, development of old policies or change to new ones, floating a large loan or canceling one, defying a strike or settling a strike, organizing the employees in the union or out, increasing a wage scale or reducing one, etc. He commended the way in which the Louisville Railway gave news about its negotiations for a readjustment of fare, and how an electric road entering Louisville talked frankly of a severe accident some years ago.

He also declared that newspapers should know news confidentially only when a release date was coming. Their hands should not be tied perpetually on news given in confidence. Utilities should also be able to know the difference between news and propaganda. The former is welcomed by the papers through their reading columns. The latter should go into the advertising columns properly labeled.

Charles N. Manning, president Lexington Security Trust Company, gave an address in which he dwelt upon the importance of the utility as a community builder.

MEETING AT THE UNIVERSITY

At 11 o'clock at the conclusion of these addresses the convention delegates boarded special cars for the University of Kentucky, and after their arrival there held a meeting in the chapel, jointly with the students of the university. Dr. Frank L. McVey, president of the university, presided, and the principal speaker was Samuel Insull, president of the Commonwealth Edison Company, who told of the early efforts of Edison and technical developments down to the present day. He declared that opportunities in the electrical business for the young man of the present time are greater than fifty years ago, provided the man is willing to make the necessary sacrifices to succeed.

After an inspection of various departments of the university and a luncheon

at the university cafeteria, the meeting reconvened in the afternoon in Mechanical Hall, where the first address was by F. Anderson, dean of engineering. Dean Anderson gave an interesting talk on training men for utilities, arguing that the men should be trained for executives rather than merely receiving a technical training, and A. S. Nichols, general manager Paducah Electric Company, spoke on "Looking Forward." There were other addresses, including one from Mrs. Florence A. Tate, chairman Women's Public Information Committee, East Central Division, N.E.L.A., who spoke about "Women's Interest in Public Utilities." Mrs. Tate referred to the numerous opportunities for positions for women in the commercial department, accounting department, purchasing department, stock and bond department, information department, and public relations department of utility companies. She also pointed out how the utilities are partners in every home and have brought to the home devices to conserve women's time and strength and for the rich and poor alike.

Miss R. E. McKee, who occupies the

same position with the Great Lakes Division, N.E.L.A., also spoke, as did W. S. Cramer, president American Water Works Association, Lexington. The subject of his address was "The Foundation of Public Service."

NEW OFFICERS

Officers elected at the meeting, just before the close, were as follows:

President, W. H. Harton, Covington, general manager Cincinnati, Newport & Covington Railroad.

First vice-president, J. P. Pope, general manager Kentucky Tracton & Terminal Company, Lexington.

Second vice-president, James P. Barnes, president Louisville Railway.

Treasurer, P. S. Pogue, president and general manager Louisville Home Telephone Company.

Secretary, E. F. Kelley, secretary to James P. Barnes, president Louisville Railway.

Executive committee: John G. Stoll, Lexington; Donald McDonald, Louisville; A. S. Nichols, Paducah; L. B. Herrington, Louisville, and H. J. Cochran, Maysville.

plaints, therefore, are more numerous and more emphatic than commendations, and the just proportion between the two is again a matter for judgment to determine. A condition may exist in which complaints are not made because of a sense of their futility. This condition is more common than is generally or frequently supposed, and under this condition the absence or rarity of complaint certainly does not denote a healthy condition of the public pulse. Other criteria suggest themselves by whose application it is easy to demonstrate that in this respect, as in others, the public's attitude must be widely observed and carefully studied by the operator who would not commit the fatal blunder of fooling himself.

Let it be never forgotten that comment regarding the conduct of a utility is more outspoken in some places and under some conditions than at others. Seldom is it true that any one man, whatever his position in the corporation or in the community, can take the full measure of what is being said in all circles, and for this reason, if for no other, it is essential that the successful utility manager shall not only be a good listener, but that he shall also cultivate and encourage the people who tell him what they hear for and against, and particularly against, his methods of management and their results in service to the public.

Every one knows that unfavorable symptoms multiply and intensify more rapidly than favorable ones. History records many cases of individuals great in their achievements, strong in their personalities, slowly building reputation and place in the public esteem, then suddenly and completely ruined in that esteem almost in the twinkling of an eye. Public relations resemble an intricate and delicate edifice, to be reared only in painstaking care and devotion over long periods of time, but subject to sudden collapse if weakness develops in foundation or structure at any one of many important points.

The time has long passed when any public utility operator will deny or belittle the importance of correct relations with the public, and the time is fast approaching when no public utility operator will dare attempt to establish public relations on any but the basis of complete and open frankness of dealing.

CHART INDICATES INTERNAL CONDITIONS

This brings me to the third, and by far the most important consideration heretofore set out, viz., that the fever chart of public relations reflects internal conditions.

Men's relations in the day to day contacts of business are on a basis which presupposes a condition of normal healthy functioning on the part of each. Seldom does the unbalanced physical or mental individual continue for long to discharge the duties of normal relationship in business matters. True, there are cases, and very noteworthy cases too, of men who rise superior to physical limitations and men-

Internal Public Relations*

The Public Relations of a Company Can Be Measured, Just as a Fever Chart of a Patient Illustrates His Condition

BY JAMES P. BARNES
President Louisville Railway

THE state of a public utility company's relations with the public it serves is an accurate thermometer of its health as a public service. Fever charts of the condition of a utility company could be charted therefrom as surely as the bedside fever chart of a hospital patient. Moreover, the public relations fever chart of the utility company bears much the same relation to its corporate health as would the bedside chart to that of a patient. When all is well, temperatures are normal and the fever chart becomes a relatively meaningless record, but let the pneumonia of broken promises (chill breaths that blow good to no one), or the blood poisoning of distrust (bred from that foul germ double dealing), affect the patient, and the fever chart becomes a mountain peak of threatening terror to nurses and physicians.

Now the parallel between individual and corporation can be developed to any desired extent and the similarity of the two is impressive. What we wish to consider especially now, however, is the very remarkable parallelism of the corporation and the individual in these important particulars:

1. The fever chart records symptoms, i.e. results, not causes.
2. The temperature goes up more rapidly and dangerously than it goes down.
3. The fever chart reflects an internal condition.

The clinical thermometer of medicine

is a simple instrument readily applied and easily understood. Its indications are positive and strictly relative; are in terms of but one dimension, viz., degrees Fahrenheit. True, pulse and respiration are also of importance, but they are strictly relative and in the case of the individual, we deal primarily with not more than three major indications, all easy of observation and comparison.

Compare this situation with the difficulty of any honest attempt, even superficially, to gage the temperature, pulse and respiration, representing, say, the cordiality, prompt response and outspoken comment critical or commendatory of the public in respect to a public utility corporation in its service.

Observation must be made from widely varying angles. The cordiality of the banker will not be the same in kind or degree as that of the laborer, and only a fine discriminating intelligence can gage the relative importance of these two and all the other classes at any particular time. Here the element of the observer's judgment enters and becomes of prime importance and the value of his observations and determinations is all too apt to be, or become, tinged with self-interest or personal prejudice.

So the first of the symptoms—temperature, is neither easy nor certain of ascertainment.

Prompt response—the pulse of the public good-will is almost as uncertain. Mankind, generally, responds more quickly and more sharply to unpleasant than to pleasant disturbances. Com-

*Abstract of address presented at a meeting of the Kentucky Association of Public Utilities, Lexington, Ky., Dec. 12, 1922.

tal or educational handicaps, and who command thereby and therefore the warmest admiration and devotion from their associates. These cases are the rare exceptions, however, and are in themselves abnormal.

The corporation must follow the lines of normal functioning, for with normal public reactions it must deal. Reactions may be widely different as between communities, but always remember that the reaction of a given community is its normal reaction, for normality is based on the average, or the majority, and as thinks the average or majority of citizens, so will the community be governed.

Grant that a community can be but normal and grant that the internal condition of the corporation serving it may be measured in terms of the normality of its particular community.

Judge the health of the public service corporation by the esteem in which it is held by its community.

Then, lest the health—that is the public relations—fail, guard first against internal cause of failure. Look to the virtue of patience, courtesy, frankness and honesty to maintain an internal understanding and sympathy so firm that neither the agitator nor the fault-finder can shake the ideals of the organization.

REPUTATION IS FOUNDED ON CHARACTER

Men who work together in sympathetic understanding learn to weigh one another's problems and to respect one another's accomplishments. The mutual respect had by such understanding forms sterile soil for the seed of the agitator and trouble maker. When men know of their own knowledge that their associates are straight, hard-working folk, each in his own sphere, there's little tinder left for the flame of soap-box oratory to kindle. Defense of those we know and trust springs readily to the lips of all of us, and no finer or more lasting monument can or need be raised to an organization than that the men of which it is composed think well of it. And as they will think, they will speak, well or ill. No man and no organization can avoid the making of a record; sins of omission are recorded along with sins of commission. Sometimes one, sometimes the other is more serious, but always the record is made, and always the record is interpreted, discussed and spread abroad. Reputation cannot be avoided. It is our business to see to it that reputation is fair and clean.

Reputation is founded on character and will in the long run conform to character. So it is our primary business to see that character is kept fair and clean. Truth is, after all, the mightiest force in the world, and so far as its making lies in our hands it is our moral, civil and corporate duty to see that the truth of our relations to associates and customers alike bears a fair and not an ugly face.

Build then internally the health of these public service corporations on a relationship of truth, of understanding,

and of sympathy. Maintain the confidence of mankind within and without by deserving it. Place service before reward—place obligation before privilege—place honesty ahead of all—honesty of purpose—honesty of method—

honesty of thought and deed—and then sleep well o' nights secure in the knowledge that summer's sun, winter's frost, nor equinoctial storm shall destroy your house—strong from within and founded on a rock.

Union Internationale de Tramways Meets

This Was the First Convention Since the War of This Association, Whose Permanent Headquarters Are in Brussels—Four Days Were Given to Technical Sessions

DURING the same week that the American Electric Railway Association was holding its convention in Chicago last October, the Union Internationale de Tramways, de Chemins de fer d'Intérêt local et de Transports Publics Automobiles held its eighteenth convention in Brussels, Belgium. This association, before the war, held meetings every two years and included in its membership electric railway companies and manufacturers from all the principal countries in Europe. The seventeenth meeting was held in Christiania, Norway, in 1912, and what was to have been the eighteenth meeting was scheduled to occur in Budapest, Hungary, in August, 1914. All of the preliminary arrangements for that meeting had been made and a number of advance papers had been issued to members when war was declared and the German forces entered Belgium. The headquarters of the association have always been in Belgium, so that all the activities of the association had to stop. Since the war, the association has been reorganized to include member companies from the allied and neutral countries only, and headquarters have been reopened in Brussels.

The first function of the eighteenth convention occurred on the evening of Sunday, Oct. 2, 1922, when the members of the association who had already reached Brussels met at an informal reception tendered at the Taverne Royale by the local committee of arrangements. About 300 delegates and many ladies were present. In many respects the meeting was one long to be remembered, especially by those who had attended earlier conventions of the association. Acquaintances who had not been seen for ten years were greeted and old friendships were revived. A number of delegates who had regularly attended other meetings were missing, but their absence, so far as numbers are concerned, was more than made up by new members who utilized this opportunity to become acquainted with each other and with the older delegates. Among those in attendance were a number of official representatives to the convention from foreign governments.

MEETING ON OCT. 3

The first official session of the association was held on Monday, Oct. 3, at the Palace of the Academies on the Rue Ducale. The chairman of the meeting was the Belgian Minister of Railways, Mr. Neujean. In his opening address he referred to the important place which

the tramways occupied in the social and business life of large cities, which could not long survive an interruption of their services. Their suburban and interurban extensions supply a necessary connection between the city and country communities. In looking toward the future of city and suburban transportation the minister said that he believed the auto bus would be used for this service more extensively than at present. He then referred to the extent to which Belgian capital was invested in tramway enterprises abroad, as in Egypt, South America, Canada, etc. He extended the welcome of the government to the association and said he would follow its deliberations with great interest.

Constantin de Burlet, the honorary director general of the Société Nationale des Chemins de fer Vicinaux of Belgium and president of the association, then gave an address, the keynote of which was the need for courage in the circumstances.

Mr. de Burlet first referred to the various distinguished government officials commissioned to attend the convention, including M. Max, Burgomaster of Brussels, whose name became known throughout the world during the war. He then referred to the conditions which had interrupted the work of the association from 1914 to 1918, to the present peace which, while here, left many wounds unhealed, and to the services rendered to Europe during the war by Mr. Hoover. But progress, he said, must be forward in spite of the many difficulties which seem to block the road.

Reviewing the history of the association, he pointed out that it had been organized in Brussels in 1885, largely through the initiative of Gustave Michelet, general manager of the Brussels Tramways, who was elected the first president and continued in that office until his death in 1897. He was succeeded by Baron Janssen, president of the Brussels Tramways, who occupied the office for fourteen years, when he was elected honorary president. It was at the earnest wish of Baron Janssen that the present president accepted the office.

After referring to the dependence of the industry on engineering inventions, Mr. de Burlet then spoke of the essential difference between improvements in the electric railway industry and in manufacturing, because of the lack of rivalry between different electric railway systems. An improvement which means a reduction in cost of the article

produced in an industrial enterprise is hidden jealously because of the advantage which it gives a company over its competitors. With local transportation companies, however, there is no feeling of this kind. Nothing is concealed, because there is no sales rivalry. Every improvement, every step toward progress, every new invention is made public, and no better place could be found, Mr. de Burlet said, for doing this than at meetings of the International Tramway Association. The advantages of this condition are great, though not always realized. Mr. de Burlet also spoke about the expansion of the association since the last meeting by the inclusion of the bus industry.

The speaker then sketched the history of motive power tried on street railways from the time of the presentation of a paper on electric traction at the 1886 meeting, pointing out that the present trolley system was largely the invention of a Belgian, then living in the United States, Mr. Van Depoele. Mr. de Burlet then referred briefly to the damage suffered by the tramway systems in Belgium during the war, due to track being torn up and cars and other equipment destroyed or removed. The total was estimated at pre-war exchange for the Société Nationale des Chemins de fer Vicinaux at Fr. 300,000,000 (\$60,000,000) and for the principal tramway companies in Belgium Fr. 25,000,000 (\$5,000,000). While this material loss was great, a greater loss was suffered through the death of officials and employees in engagements against the invader. It was a satisfaction, however, to see so many old faces back and to realize that in the present membership twenty-seven nations are represented.

After referring to several of the topics before the association, President de Burlet announced as the first paper on the program that by Mr. Mariage, general manager Paris Tramway System, on the "European Electric Railway Financial Conditions." An abstract of the paper appears on page 754 of the issue of this paper for Nov. 4. Owing to the absence of Mr. Mariage, his paper was read by Mr. Bacqueyrise, one of his associates. This was followed by a paper by Mr. d'Hoop on "Welding in Tracks and Shops," which was abstracted in the issue of Nov. 4, page 753. The discussion was brief.

In the afternoon an excursion was made to the Colonial Museum at Tervueren, and this was followed by an evening theater party.

MEETING ON OCT. 4

The session on Tuesday, Oct. 4, was presided over by Mr. Norregaard, manager of the Copenhagen Tramways. The first paper of the session was on "Motor Service Organization in Great Cities," by H. E. Blain, managing director London Underground Railways and London General Omnibus Company group. In the absence of Mr. Blain the paper was read by James Dalrymple, general manager Glasgow Corporation

Tramway. It appears in abstract in the issue of Nov. 4, page 750. At the conclusion of the paper, Mr. de Burlet extended thanks to Mr. Dalrymple for the clearness of the presentation of the paper and to Mr. Blain for the contribution.

Mr. Castaing, delegate from the city of Paris, added some interesting information in regard to the operation of the Parisian bus system. He said that at present there are 1,050 buses in Paris, but next year it is expected that there will be 1,400 buses, serving a total of sixty lines. These buses cover about 120 km. (75 miles) per day and use benzol as a fuel. Tests are being made with a new fuel consisting of 50 per cent benzol and 50 per cent alcohol. It is hoped before long that all the cars will be operated with this mixture.

Mr. Dalrymple said that in Glasgow with 1,250,000 population there was not a single omnibus.

The next paper on the program was by C. J. Spencer, general manager London group of tramway companies, on "Modern Improvements in Tramway Rolling Stock." An abstract was published on page 641 of the issue of Oct. 14. In Mr. Spencer's absence the paper was read by Mr. Beckett, chairman of the Municipal Tramways Association of London, who explained that Mr. Spencer and Mr. Blain had been detained from attending the meeting because of labor troubles.

In the following discussion Mr. Bacqueyrise spoke about some work done by the Paris Tramways in building some new cars with center entrance. If progress in Europe in car design is not so rapid as in America, he said, it may be attributed to the fact that the European engineer is more conservative than the American engineer and has less money to spend on experiments. He indorsed the suggestion in Mr. Spencer's paper that rolling stock waste could be reduced to advantage and referred to some work along these lines in which his company was engaged. (See issue of *Electric Railway Journal* for Dec. 2, page 878.) He hoped to secure with this car an economy of energy of 9,375,000 kw.-hr. annually, equivalent to 15,000 metric tons of coal at a cost of about Fr. 2,800,000. Mr. Bacqueyrise said that the weight of the motors on this car would not be more than 15 kg. per horsepower in place of 32 kg. formerly. He also referred to the novel method of braking, in which the brakes are applied to the shaft of the motor and are quick acting. The distance required to make a stop from full speed is reduced from 45 m. to 20 m. Mr. Peridier, technical expert of the same company, gave further particulars.

This concluded the morning session. The afternoon was spent in a trip to Charleroi to inspect the new shops of the A.C.E.C., large parts of which are new because the Germans removed the former equipment during their occupation. The wire works attracted special attention. In the evening the management of the Brussels Tramways ten-

dered the delegates a reception at the Hotel Astoria.

MEETING ON OCT. 5

The chairman at this session was Mr. Pavie, of the Compagnie Générale Française de Tramways of Paris, and the first paper read was that by Mr. Sekutowicz of the Omnium Lyonnais on "Automatic Substations." An abstract appears in the issue of Nov. 4, page 753. This was followed by an address by Mr. Rochat, manager of the Geneva Tramways, who gave statistics on the increase in wages and cost of materials used in railway operation in Switzerland in 1913 as compared with 1920. Then followed a paper by Mr. Nieuwenhuis, manager Arnhem Tramways, on "One-Man Cars" (see issue of Dec. 2, page 881). It developed following this report that one-man cars had been tried by member companies only in London, Amsterdam and Arnhem. Mr. Thonet mentioned some experiments made with one-man buses in the small town of Hny, which had given complete satisfaction.

The chairman of the afternoon session was Mr. Rochat of Geneva, and the first paper read was that on "Mercury Arc Rectifiers" (see issue of Nov. 4, page 752). The chairman complimented Mr. Odermatt on this paper and the Brown-Boveri Company on their construction.

Mr. Peridier, Paris, said he had tested some of these rectifiers and the results had been satisfactory. The apparatus possessed one peculiar quality. This is its faculty of withstanding extreme overloads. While a rotary had to be figured for an overload of a maximum 200 per cent, the rectifiers could stand momentary overloads of 300 per cent without difficulty. This is a great advantage for small systems.

The next paper on the program was that by Mr. DeCroes, Société Nationale des Chemins de fer Vicinaux, Belgium, on "Gas Motor Cars for Interurban Railways." This is abstracted in the issue of Nov. 4, page 751.

Mr. Level pointed out that some companies wanted a light and others a heavy car. Either could be built. Cars could be produced as light as 2 to 2½ tons, but there was more danger of their derailment. Mr. Varcollier explained that his system used the gas car as an auxiliary during times of very heavy traffic. Mr. Castaing spoke of the advantages of the car for routes of very light traffic, but declared that it ought to be double ended to avoid the expense of turntables, loops or wyes. His system uses cars weighing 8 tons, seating forty people, and with a maximum speed of 40 km. (25 miles) per hour.

The final report of the day was by Mr. Pirard on "Different Systems of Electric Traction for Interurban Service." It is also published in abstract in the issue of Nov. 4, page 750.

In the discussion Mr. Latigue advocated 600 volts for city tramways and 1,000 volts in the open country. Motors wound for the latter voltage could then

easily be speeded up on interurban cars when the distances between stops were longer, while the tramway cars could use the cheaper motors wound for the lower potential. Mr. Peridier was of the same opinion. After further discussion the convention adjourned the last of its technical sessions.

THE BANQUET AND BUSINESS SESSION

Oct. 5 closed with an official banquet at the City Hall, attended by prominent municipal and national officials. The twenty-seven delegates from foreign countries occupied the place of honor, and more than 400 delegates and guests were present.

The business session of the association was held on Friday, Oct. 6. The most important subject considered was the place of the next meeting, to be held in 1924. Invitations were received from Glasgow, Barcelona and Warsaw, but no definite decision was made. A list of the officers elected was published on page 883 of the issue of Dec. 2. In the afternoon the delegates visited the shops of the Société d'Electricité et de Mécanique, builders in Belgium of G. E. motors, and the following day took a trip to Yprès and visited many of the famous battlegrounds.

Southwestern Electrical & Gas Association

THE Southwestern Electrical & Gas Association will hold its 1923 convention in Fort Worth, Tex., May 15, 16 and 17.

The convention committee consists of G. H. Clifford, chairman; C. E. Calder, C. P. Dodson, A. J. Duncan, H. C. Morris, R. J. Irvine, J. H. Gill, Alves Dixon, P. E. Nicholls and E. N. Willis, secretary.

Plans to federate the Southwestern Association with the South Central Association were reported and given indorsement.

A National Standard of Conductivity for Aluminum

CHARLES R. HARTE, construction engineer the Connecticut Company, New Haven, Conn., has been appointed chairman of a sectional committee of the American Engineering Standards Committee in the matter of standardizing aluminum for electrical conducting purposes. The American Institute of Electrical Engineers has been designated as sponsor for this work. Mr. Harte represents the American Electric Railway Association on the committee. Interests other than those mentioned which are represented are the American Railway Engineering Association, the American Society for Testing Materials, the United States Bureau of Standards, the Electrical Power Club and the National Electric Light Association. The organization of this committee was completed at a meeting held on Dec. 20.

The organization meeting was held in New York City, with the following in attendance: Chairman Harte, J. D.

Edwards, chief physical chemist Aluminum Company of America; F. D. Hall, electrical engineer Boston & Maine Railroad; William Nesbit, representing Dean Harvey, Westinghouse Electric & Manufacturing Company; Prof. F. A. Laws, Massachusetts Institute of Technology; Dr. Frank Wenner, United States Bureau of Standards; Dr. P. G. Agnew, American Engineering Standards Committee.

Two sub-committees were appointed as follows: On research, Dr. Wenner, chairman; J. M. Darke, General Electric Company, and Messrs. Edwards, Harvey and Laws. On policy, Mr. Harvey, chairman; William Hoopes, Aluminum Company, and Mr. Harte. The research committee will collect data on the properties of aluminum, and make original investigations. The policy committee will lay out a program and prepare arguments regarding the different possible bases of standardization.

Engineering Section of A.A.A.S.

IN CONNECTION with the annual meeting of the American Association for the Advancement of Science, to be held at the Massachusetts Institute of Technology, Boston, Dec. 26-30, the Engineering Section will hold a session on Friday afternoon, Dec. 29. F. M. Feiker, vice-president McGraw-Hill Company, Inc., is chairman of this sec-

tion. There will also be joint sessions with the Social and Economic Sciences Section, Friday morning and evening. Among the speakers at these sessions will be President Ira N. Hollis, Worcester Polytechnic Institute; Prof. C. F. Scott, Yale University; W. S. Murray, consulting engineer, New York City; Harrington Emerson, New York City; Calvin W. Rice, and others representing national societies and other organizations.

Association Establishes Accounting Service Bureau

THE Wisconsin Utilities Association, through its executive secretary, John N. Cady, Madison, Wis., announces the establishment of an accounting bureau in connection with the secretary's office. This has been done especially to give the smaller member companies the benefit of expert accounting service. The director of the bureau is Prof. Karl F. McMurry, who is a certified public accountant and has had extensive experience in various lines of accounting work. As far as possible, the association plans to give service to member companies without extra charge, when the work can be done at the Madison office. In cases where extensive services are required, especially work involving trips to the utility's office, this unusual service will be charged for at cost.

American Association News

Special Committee on Wood Preservation

A MEETING of the special committee of the Engineering Association appointed to carry on the work formerly done along wood preservation lines under the auspices of the committee on way matters met in New York City on Dec. 19. A. P. Way, American Railways, Philadelphia, was appointed vice-chairman. The following sub-committee appointments were announced:

1. *Specifications for open-tank treatment of poles.*—E. F. Hartmann, chairman; A. P. Way, E. L. Morier.

2. *Specifications for brush treatment of poles.*—A. P. Way, chairman; E. F. Hartmann, C. A. Smith.

3. *Specifications for pressure treatment of poles.*—C. A. Smith, chairman; M. J. Curtin, W. H. Fulweiler.

4. *Specifications for treatment of crossarms.*—M. J. Curtin, chairman; W. H. Fulweiler, E. L. Morier.

5. *Perforation process for timber treatment.*—E. L. Morier, chairman; M. J. Curtin, C. A. Smith.

6. *Review of existing specifications of the association.*—W. H. Fulweiler, chairman; A. P. Way, E. F. Hartmann.

The meeting was occupied with general discussion of the principles involved in the year's work, and suggestions were made to the sub-committees as to the lines of work which each

might profitably take up. Full advantage was taken of the fact that the membership of the committees comprises experts in each of the subjects covered by the committee's assignments. The upshot of the discussion was that the specifications which are prepared shall be drawn with full consideration of the practical conditions which pertain in the preservative manufacturing field and on the commercial side of the pole business. The importance of securing co-operation with other pole-using industries was also emphasized, in view of the fact that practice in preservation and pole production is affected, in fact controlled, by the demands of the large purchasers of poles and cross-arms. The work of the American Engineering Standards Committee in this connection was seen to be promising.

Among the practical questions discussed by the committee, that of pole rehabilitation was given careful attention. The practicability of brush-treating partly rotted poles will be especially considered by sub-committee No. 2.

In closing the meeting Chairman H. H. George read a letter from the A.E.S.C., stating that a creosote-oil specification had been submitted to it by the Federal Specifications Board, S. W. Stratton, chairman, and that a committee is now considering the prep-

aration of a specification which will bring the federal government's specification into line with the best practice. The American Electric Railway Engineering Association is asked to co-operate in this work.

The committee agreed, tentatively, to meet next in Washington, on Feb. 15.

Publication of Series of Accident Prevention Signs Begun

THE committee on co-operation of manufacturers, through the Advertising Section, American Electric Railway Association, has just prepared the first two of a series of accident prevention signs as illustrated. Similar signs, dealing for the present chiefly with collisions between automobiles and electric cars, will be sent out from time to time. These will be supplied in reasonable quantities to member compa-

Revision of Safety Code

AT THE recent meeting of the Engineering Association committee on power distribution, Sponsor C. R. Harte reported regarding the activities of the American Engineering Standards Committee in the revision of Part II of the National Electrical Safety Code and the preparation of standard specifications for wire crossings. He stated that, following out the suggestions of the Engineering Association on this subject, Dr. M. G. Lloyd, of the United States Bureau of Standards, in due course, named a committee which determined the representation of each of nine interests involved, to secure a balanced general committee. On Nov. 2, as reported in the issue of this paper for Dec. 2, page 883, this committee met at Washington, and elected Dr. Lloyd chairman, C. B. Hayden vice-chairman, and

ing Association appointed representatives to serve on each of the three committees which it was expected would be organized to deal respectively with power lines over railroads, power lines over signal lines, and signal lines over railroads.

The procedure now being followed in no way affects this plan; the present work is necessarily preliminary to the preparations of any working specifications and the latter will not be touched until the foundation is well established.

Educational Program Inaugurated

A LARGE attendance of the new American Association committee on education, at a meeting held in New York City on Dec. 8, attested the interest of electric railway managers in the training of their employees. No specific assignments had been made to the committee by the executive committee, so that the first task was to review the whole field of possible activity and select for this year's work the most promising part.

It was concluded that the first task is to secure co-operation of electric railway managers in putting educational plans actually to work on the several properties. The report of last year's committee outlined the possible educational activities clearly, so that the first thing now is to urge the putting into practice the suggestions of that committee.

Each company will be asked to appoint a responsible person to "head up" the local educational activities. Through these men the committee hopes to be of assistance to the companies in furnishing suggestions for actual procedure. It is expected also that the attention of managers will be drawn to the importance of this work through conventions of the sectional electric railway associations.

Efforts will also be made this year to utilize the experience of educational committees of other organizations.

The committee's plans assumed tangible form during the meeting, but will not be announced in detail until the local educational men are appointed, which should be soon.

The New York meeting was attended by Edward Dana, general manager Boston Elevated Railway, chairman; Dr. Thomas Conway, Jr., Aurora, Ill.; C. B. Fairchild, Philadelphia, Pa.; M. B. Lambert, East Pittsburgh, Pa.; C. E. Morgan, Brooklyn, N. Y.; H. H. Norris, New York, N. Y.; William von Phul, New York, N. Y., and Thomas S. Wheelwright, Richmond, Va., members of the committee, as well as the following guests: C. S. Coler, manager educational department Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; Dr. H. E. Bricker, medical department Philadelphia Rapid Transit Company; W. A. O'Leary, director of vocational education State of New Jersey, Trenton, N. J., and Prof. W. H. Timbie, Massachusetts Institute of Technology.



THESE POSTERS ARE THE FIRST IN A SERIES DESIGNED TO FURTHER THE CAUSE OF ACCIDENT MITIGATION, PARTICULARLY THE REDUCTION IN NUMBERS AND SEVERITY OF COLLISIONS BETWEEN AUTOMOBILES AND TROLLEY CARS

nies without charge, and it is hoped that they will be displayed where automobile drivers will be most likely to see them. It is suggested that manufacturing and operating member companies co-operate in the placing of the signs in automobile clubs, public garages, etc.

J. W. Welsh, executive secretary of the association, is requesting that he be informed immediately by telegraph or letter how many copies of these signs will be needed.

One-Man Car Operation

A MEETING of the committee on one-man car operation of the Transportation & Traffic Association was held at the New York headquarters on Dec. 18. Those in attendance were J. P. Pope, Lexington, Ky., chairman; J. E. Duffy, Syracuse, N. Y.; A. L. Reynolds, Youngstown, Ohio, and Karl A. Simmon, East Pittsburgh. The subject especially assigned to the committee this year is one-man operation in suburban and interurban service. A questionnaire was considered, and it was decided to send out a short one asking for information which would be supplementary to a recent questionnaire on one-man cars which was sent out by the Information Bureau.

The committee will probably make a study of the safety features of this type of car and list the advantages and disadvantages.

Roy M. Dwyer secretary. An executive committee was also appointed.

Following the adjournment of the general committee the executive committee met but took no definite action and adjourned to Nov. 27.

At that date, it was decided that the fundamental question at any crossing was the degree of hazard; that with this determined the rest of the problem was comparatively simple; but that until such determination was made little else could be done except to collect data as to permissible construction details. Accordingly there were appointed four committees, each interest being given appropriate representation.

The four committees are as follows: (1) *Grades of Hazards*—Thomas Sproule, R. A. Bloomsburg, C. R. Harte, A. E. Knowlton, M. G. Lloyd, S. M. Viele, K. L. Wilkinson. (2) *Allowable Clearances*—M. C. Wagner, M. G. Lloyd, J. H. Mathews, R. A. Smith. (3) *Allowable Ultimate Strength*—R. D. Coombs, J. A. Capps, R. C. Dwyer, W. L. Morse, W. C. Wagner. (4) *Underground Construction*—M. B. Rosevear, Arthur Halstead, W. H. Homer, A. L. Pierce, G. C. Post, F. K. Shinnen, W. C. Whiston. Others are to be added by the interests desiring representation.

The executive committee constituted itself a committee on correlation.

At the time Dr. Lloyd was forming the sectional committee, the Engineer-

News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Franchise Valid

Higher Court Rules in Favor of Des Moines Railway—Extensions and Improvements Expected

The Des Moines City Railway and the city of Des Moines won a sweeping victory on Dec. 15 when the Iowa Supreme Court held the Des Moines franchise valid.

The case went to the Supreme Court upon appeal by the city of Des Moines and the Des Moines City Railway from the decision of Judge James C. Hume of the Polk County District Court, who held that the franchise election held in November, 1921, which granted the city railway a sliding scale service-at-cost-franchise, was illegal. Suit against the franchise was brought by the North Des Moines Improvement League with Grant Van Horn as the principal.

OVERWHELMING RAILWAY VICTORY

Not only was the high court's ruling an overwhelming victory but it has the further strength of having been concurred in by all six justices of the Supreme Court. The decision was written by Truman S. Stevens, chief justice.

The Supreme Court held that the franchise was not a perpetual nor exclusive grant but that the publication clause, which was one of the points particularly aimed at by Van Horn, was entirely adequate. Justice Stevens held that the title was not defective on account of carrying more than one subject.

According to the ruling Van Horn held no vested rights in the former franchise which was abrogated by the one accepted by the voters in November, 1921. Justice Stevens held that a vested interest is not a mere privilege but an actual property right.

PUBLIC APPROVES OF FRANCHISE VALIDITY

The decision has been received with much approval on the part of citizens of Des Moines generally, for ever since the Des Moines City Railway was granted the higher fare by the new franchise the city has enjoyed a constantly improving service and there has been a great deal of improvement on the physical property. H. W. Byers, former corporation counsel for the city, who fought the city railway at every point during his ten years in office, and who was the principal attorney for Van Horn and the North Des Moines Improvement League, when interviewed, said the "opinion seemed to be a sweeping victory for the company."

Daily newspapers have accepted the decision as a further sign for improvement in conditions here, and even the daily which has taken an unfavorable stand all through the franchise proceed-

ings commented editorially in a favorable vein.

F. C. Chambers, general manager of the Des Moines City Railway, is quoted in the daily papers as seeing decided improvement in service and plant with possible new extensions as a result of the high court's decision. Mr. Chambers calls attention to the fact that the company will now be able to market its securities more successfully in order to permit of the expenditures for improvements and extensions.

Mayor Garver has stated that with the legality of the franchise settled the city will now be in a position to ask the company to make the extensions which are necessary to catch up with the growth of the city.

The franchise moves have been noted previously in the **ELECTRIC RAILWAY JOURNAL**.

Plans for Rehabilitation Fail

The interurban line which until last March was operated between Cincinnati and New Richmond, Ohio, under the name of the Interurban Railway & Terminal Company, will not be rehabilitated and restored to service. This announcement was made by William E. Harton, president of the Cincinnati & New Richmond Railway, originally organized to take over this operation. Mr. Harton is general manager of the Cincinnati, Newport & Covington Traction Company.

Failure of shippers along the route to support the project is given as the chief reason for the collapse of the plan. Persons living along this line also will be deprived of electricity, as the new company expected to supply the vicinity bordering its line with power.

The work of dismantling the old Interurban Railway & Terminal Company line already has been started. The tracks will be torn up and all equipment and stock sold or junked. This work is under the direction of Charles Leslie, receiver for the company, with offices in the Second National Bank Building.

Those interested in the proposed successor company said that residents of New Richmond had enlisted in the project. Arrangements had already been completed whereby the new company was to take over the municipal electrical generating plant of that village. The shippers who refused to promise their business to the new line believed they could ship by trucks and river at a lower cost than offered by the traction company. An arrangement whereby the New Richmond line would use the Cincinnati, Georgetown & Portsmouth Traction Company's tracks between Coney Island and Cincinnati had been worked out by officials of the new company.

\$95,000 Christmas Bonus

A Christmas bonus of approximately \$95,000 was paid to trainmen by the Los Angeles (Calif.) Railway Dec. 15. This is the third annual bonus paid by the company under the merit system. Bonus checks were given to 1,976 men.

The bonus is \$60 a year at the rate of \$5 per month. When a man's efficiency rating is 100 per cent or better for a month he is credited with \$5, unless he has been absent on leave more than the prescribed number of days.

A new trainman entering the service is entitled to participate in the bonus plan after he has been in the service six months. He starts with an efficiency record card of 100 per cent and receives merits or demerits, according to the type of service he renders. A clear courtesy record for a month gives a trainman ten credits or 2 per cent increase in his efficiency rating; the same applies to a clear safety record. Other credits are given for special acts of efficiency reported by passengers or supervisors, and a man may claim credit for acts above the ordinary line of duty which he reports himself.

Demerits are recorded for acts of discourtesy and careless operation, careless reports, and other miscellaneous offenses. Demerits may be offset by credits, enabling a man to maintain his record above 100 per cent.

When a trainman's efficiency record goes below 75 per cent, he automatically dismisses himself. Only three such cases have been reported in 1922, and all but thirty of the men participating in the bonus had records of 100 per cent or better each month.

Report on Bill in Prospect

Enactment of a public utilities bill, providing for the regulation of all public utilities to be vested in a commission of the state government, will be urged by the League of Texas Municipalities. Action looking to the drafting of such a bill and its enactment into law were taken last summer at the annual meeting of the league. At that time a committee was appointed to prepare a draft of a bill.

After several meetings this committee secured the services of Dr. G. C. Butte of the University of Texas. Dr. Butte was on leave from the university to pursue special studies in utility legislation, and has been busy for three months preparing the Texas bill.

At a recent meeting of the committee in Fort Worth, Dr. Butte submitted a report as to what had been done. The bill, it is said, will be ready for introduction when the Texas Legislature convenes in January.

\$8,513,000 Spent in St. Louis in Three Years

Impressive Talk by Manager for United Railways' Receiver—17,782 Items of Supplies Bought, 720 from Local St. Louis Firms or Firms with Local Offices—Electrical Board of Trade Surprised by Figures

COL. A. T. PERKINS, manager for receiver United Railways, St. Louis, Mo., appeared before the Electrical Board of Trade in St. Louis a few days ago and gave a succinct account of the last three and a half years' stewardship of the property under the receiver. He told his hearers what the city must have or should do in connection with a reorganization, which is expected to take place early in 1923.

As a manufacturer of street car rides, said the Colonel, he desired to outline a few things of interest from a little different point of view—items that form the background for next year, and in which the men present were interested as citizens and manufacturers, and also as occasional users of street railway transportation.

After several years of handling the property, the speaker stated, the management found to its own great satisfaction that a majority of the traveling public is behind it. There is still some criticism due to misunderstanding, but the active opposition comes from a few persons with the mistaken idea that as in the past it is still popular to attack a thing because it is big. He deplored apathy on the part of business men, who as a whole are not making much use of trolley facilities, but use other vehicles except when the weather gets bad. Then they come to the trolley.

SURPRISE EXPRESSED AT FIGURES

Expressions of amazement were heard at some of the tables when Colonel Perkins launched into the manufacturing feature of his talk by stating the extent of supplies purchased by the receiver. He is using 17,782 different items of supplies, according to a catalog recently completed. Last year these items were purchased from 720 different firms either manufacturing or having offices in St. Louis and of these 720 there are 413 enrolled as members of the Electrical Board of Trade, 243, or about 60 per cent, represent firms from which the management has been buying electrical supplies in amount more than \$600,000.

In touching further upon electrical matters, the Colonel stated that the amount of electricity for power and lighting purchased in the city of St. Louis this year was 390,000,000 kw.-hr., from the main producers, of which 215,000,000 are for lighting purposes. Of the remaining 175,000,000 the United Railways uses 47½ per cent, or almost half of the entire output for power purposes. The system uses about 30 per cent of all produced.

Colonel Perkins told what had been accomplished by the receiver and his staff in the last three and a half years by quoting some of the compliments which were paid to the management recently by Mayor Kiel at the North Broadway new station celebration.

While certain persons continue attacks from political motives, the Colonel commented, they do not represent the public. Contrasting conditions in St. Louis with those in Kansas City, he quoted a statement from the City Counselor of Kansas City before the Missouri Public Service Commission. The attitude of the Kansas City official was that an injustice would be done the people of that municipality who use the street cars if his office insisted upon a reduction of fares that would seriously impair street car service. In St. Louis the City Counselor is demanding a reduction from 7 to 5 cents. A lower fare would hurt service in St. Louis.

PERSONNEL DEVELOPED

The Colonel told how the personnel has been developed under the receiver along lines somewhat different from any other he knows of. This personnel of between 6,000 and 7,000 men is for the most part trying to give the public the best service possible with the facilities at hand. During the last three and a half years about 1,500 motormen and conductors have been replaced; about 500 have been discharged, because they were not doing their work well. The manager has arranged to meet the new men every week, talks to them, soon calls them by name, and establishes relations that quickly lead to efficient and courteous service. About 95 per cent of the men are doing good work. A small percentage of the men who lose their temper must go. And those who go cannot come back, Col. Perkins stated. He then said:

In the last three years, we have reconstructed 100 miles of track at a cost of \$4,000,000. We have rebuilt 100 old cars at a cost of \$1,000,000. We have built 150 new cars at a cost of about \$1,500,000. Another fifty new cars under way will cost \$513,000. To handle the new equipment it has been necessary to build other things—a new station and shops, seven new power substations, besides spending \$1,500,000 for street paving for the use of the public. Moreover, United Railways is the largest taxpayer in Missouri, nearly 1 cent of every cash fare being paid out for taxes.

We really do not get 7 cents for a car ride, the average being 6.89. Leaving out firemen and policemen and figuring in the transfers the average is 4.48 cents per ride. Although there was no increase in travel, records show that in October, 1922, on week day mornings we operated 1,153 cars as compared with 1,099 in October of last year, while in the evenings this year the average was 1,337 cars as against 1,163 in 1921.

What can be done with the traffic has become a grave problem. Rerouting has become imperative. At Eighteenth and Washington automobile traffic has become so congested it is now impossible to get all of our cars through and therefore Park and Compton cars westbound are now sent over Fourteenth Street to Pine and Eighteenth Street. Last year the receiver put in half a dozen new curves at a cost of about \$4,000 each, and more are needed.

Step by step and year by year the management is working on the scheme laid down by the City Plan Commission, toward rapid transit.

The needs of the United Railways will be more serious next year, Colonel Perkins stated. In this connection he said:

We are reaching a crisis in the valuation case before the Missouri Public Service Commission. Our brief has been filed and the city's brief probably will be filed in January. It is a big case and the commission is expected to be fair in determining the value of a great property embracing 460 miles of lines, 525 miles of track, 1,530 cars and holdings scattered all over St. Louis, St. Louis County and St. Charles County. An early decision is hoped for. A total of \$11,000,000 of securities fall due in 1923, and at least \$4,000,000 is needed for improvements. What are we going to do to get it?

In answer to his own question, Colonel Perkins said that in order to reorganize the property new franchises are essential. The old grants present a fearful mixture of different conditions, rates of taxation, etc. And speaking of taxes, the Colonel remarked that the management has paid the mill tax faithfully. In future franchises the city should be protected and so should the people who refinance the property for public service.

In referring to the 100th birthday anniversary of the late Erastus Wells, father of the receiver and St. Louis pioneer street transportation leader, and in sketching the history of transportation with which the Colonel has been connected since 1887, a year before the first electric line was operated, Manager Perkins drew the lesson that the public and its representatives must look far ahead in developing the street car service of St. Louis. Besides making the 1923 model the best possible, it behooves the people as a whole to prepare for the future by getting behind the transportation interests and thereby bring about a service of quality and quantity that is essential to the prosperity of the city.

Legislation on Cities' Contribution to Railway Operation

Among the recommendations which the Massachusetts Department of Public Utilities will make to the Massachusetts Legislature next January is one to the effect that cities and towns shall be authorized to contribute toward the cost of street railway operation. It is provided that the Public Utilities Commissioners shall investigate the situation where one city or town petitions for authority to make such contribution, and the commission shall make such recommendations as it deems shall best further the interests of the communities affected. It is proposed that the cities and towns shall be authorized to make contributions for the purpose of securing lower fares and for avoiding a reduction or discontinuance of service.

The main recommendations to the 1923 Legislature will come later when the commission reports on a number of measures that were submitted to it by the 1922 Legislature relative to transportation service in Greater Boston. In connection with its study of that problem the commission visited New York and Philadelphia to inquire into the operation of the street railway systems in those cities.

New Ordinances Adopted

Regulations Effective in January One Provide for Identification Card System
Elimination of Bus Competition and Track Abandonments—Result,
Means More Municipal Control

TRACTION line operation in Davenport, Ia., was put back on a permanent basis and the legal tangle between the public utilities and the city of Davenport unsnarled recently when the City Council adopted a new set of ordinances which provides for the adoption of the identification card system of street railway fares, elimination of jitney bus competition and authorization for the company to shorten its downtown loop by abandoning trackage. The new ordinance will also result in wiping out numerous court injunctions under which the street cars operate at the present time. The general effect of the Council action is to give the company considerable relief and provide for municipal instead of court control.

EIGHT-CENT FARE WITH CARD PLAN

The present 8-cent fare is adopted by the city. It was fixed by court order over a year ago following a protracted legal battle with the former socialist city administration. The original temporary injunction of May, 1920, put a 7-cent fare into effect and this was later modified by a court order to provide for an 8-cent fare.

Entry of the identification card plan of fare is provided for in a clause which gives the city authority to put this into effect at any time following a thirty-day written notice. Under this plan the passenger pays 50 cents per month for a card and 5 cents every time he rides. It is expected that this plan will be put in operation after the holidays.

The company is required to submit a monthly report of the number of passengers carried and a detailed statement of receipts and expenditures so that in the event of the revenues showing a material increase the city will feel justified in lowering the rate.

At present, according to City Attorney Thuenen, the company is earning less than 1 per cent on its investment, a figure which he states he has secured through months of investigation.

LOSS OF \$1,000,000 SINCE WAR

Joe R. Lane, attorney for the company, stated that the Tri-City Railway Company of Iowa had lost approximately \$1,000,000 since the beginning of the war, for he declared that a surplus of \$500,000 had been used up and that at the present time the company was the same amount on the wrong side of the ledger.

The identification card system was submitted to the socialist administration but was turned down by the socialist majority. As a number of the present Aldermen have privately declared themselves in favor of the card plan, it is expected that the plan will go into effect shortly. The ordinance also allows the sale of four tokens, each good for one car ride, for 35 cents.

Licenses for jitney buses are made from \$15 to \$35 a year, depending on the seating capacity of the bus. Jitney competition was also practically wiped out by a provision which declares there shall be no bus lines on streets where there is a traction line, providing, however, that where a terminus in the business district is established and must be reached by prohibited streets, buses may operate on these prohibited streets for such distances as are necessary to connect the terminals. Bus routes will be established later by the Council.

No bus may stop, take on or discharge passengers within any street intersections on streets on which street car lines are located except at the opposite corner from the one at which street cars regularly stop.

Both the city attorney and the members of the street car committee of the Council held that direct competition of the bus lines with the company was unfair, although they said that the buses had a certain value. The ordinance adopted by the Socialist City Council in August of 1920 by which jitneys were allowed to operate has been repealed. The ordinance also provides that the buses must operate on a permanent schedule and outlines the service which they must give to the public. Inasmuch as the buses now running parallel to the Third Street and Rockingham car lines do not maintain a continuous service throughout the day, operating only during the rush periods, it is believed that the new ordinance will wipe them out of business.

Jan. 1 is the date of effect of all of the utility regulation provisions.

LOOP WILL BE SHORTENED

Another bone of contention between the old Council and the utilities was removed when the Council adopted another ordinance which allowed the shortening of the downtown loop by eight city blocks. The company is ordered to remove its track and ties on Second between Scott and Warren Streets and on Warren between Second and Third Streets. It is stated that the elimination of this waste is essential to reducing the cost of operating cars. The company is to lay a new base for resurfacing of the street in the area where its tracks are removed.

The ordinances also provide that the company shall assume the cost of "devilstrip" paving that portion of the paving between the tracks where there is a double track. This agreement will assess a considerable charge against the company which the utilities sought to be freed from.

The present City Council went into office in last April, following one of the hottest battles in Davenport municipal history. The defeated party charged the successful mayoralty candidate and his aldermanic colleagues with the ac-

tive support of the car company and other utilities.

This is the first move toward utility rate readjustment made since the new administration came into office, but the settlement arrived at is the result of negotiations between city officials and company representatives extending over several months.

Albany Car Jumps Track, Injures Fourteen

Fourteen persons were injured when a crowded one-man car of the United Traction Company, Albany, N. Y., split a switch and jumped the tracks on the Second Avenue line on Dec. 16 and coasted down the hill on the sidewalk, carrying away the stoops of four houses, knocking down two electric light poles and traveling an entire block before its mad career was checked.

This accident is the third of its kind that has occurred at the same point. In the summer of 1912 a car going down Second Avenue left the track in attempting to make the switch and crashed into the house at the northeast corner of Broad Street and Second Avenue, injuring several persons. As a result of this accident the switch was changed to South Pearl Street and Second Avenue, a block below. About two years after this a car left the track at South Pearl Street and Second Avenue and nosed its way into the undertaking establishment of J. M. Foll, where the trolley car finally was halted in this recent accident.

A. E. Reynolds, general manager of the United Traction Company, said that it would be possible for both air and hand brakes to function and yet have the car slide backward down the rails, if they were slippery. He added that he did not know of any safety device that could prevent such accidents, provided brakes functioned and locked the wheels.

In addition to the air brakes, Mr. Reynolds said all the cars have the hand brakes in case of emergency.

Company Opens Bank Accounts for Babies

Announcement has been made at the offices of the Monongahela Power & Railway Company, Clarksburg, W. Va., that babies born into families of the employees in the year 1923 would be presented with a \$5 deposit in a handy bank. The bank book will be mailed to the happy mother as soon as it is received from the bank.

The baby fund is one of the many features that have been introduced by the company since Capt. George M. Alexander of Fairmont has been its president.

The Employees' Beneficial Association, which provides benefits for sick and injured employees at a very small cost to the men, and the annual outings of the employees held at Parkersburg and at Clarksburg are other activities that are proving popular with the employees of the company.

Tentative Regulatory Program Announced

The tentative public service legislative program of the newly elected Democratic administration in New York State calls for the creation in the city of New York, under provisions of its city charter, of a transit department to supersede the present state appointed transit commission and a public utilities department to take the place of the jurisdiction of the Public Service Commission over other utilities not regulated by the transit department, excepting telegraph lines.

To these newly created city departments will undoubtedly be transferred the employees now in the Transit Commission and the New York office of the Public Service Commission. Appointive power of the heads of the newly created departments and their compensation will be vested in the city of New York.

For other cities and municipalities, it will be made optional whether they regulate their own public service corporations or accept the regulation imposed by the State Public Service Commission, which is to be continued.

The public service commissions law itself, of course, will be amended, stripping the commission of certain powers and duties in relation to the city of New York and other municipalities where such powers and duties are exercised by local commissions or departments of municipal government and that part of the public service commissions law relating to the Transit Commission will be repealed, as its provisions will, for the most part, be written into New York City's charter.

Order Prevents City Interference

A temporary restraining order preventing the city of Milwaukee from interfering in any way with one-man car service on three of the city lines of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., was recently issued by Judge Schinz of the Circuit Court. The city claimed that one-man car operation was in violation of a 1914 ordinance requiring that every street car must be operated by a crew of at least two men. A warrant was recently sworn out charging a violation of this ordinance by the company. On the other hand the company claimed that it has been operating one-man car service with the permission of the Wisconsin Railroad Commission and that the city has no power to legislate over the matter. It therefore asked for a temporary restraining order and later to have the order made permanent.

City Responds to Railway Offer

The city of Kitchener, Ont., will offer the Waterloo-Wellington Railway, which operates between Kitchener and Bridgeport, \$25,000 for its track, rolling stock and carhouse. The franchise expires in February and the company has asked the city either to grant a thirty-five-year franchise or to purchase the road.

The City Council will submit a by-law to ratepayers to provide \$70,000, of which \$25,000 will be for the purchase of the assets of the road and the balance for equipment and operation in conjunction with the Kitchener & Waterloo Street Railway. W. H. Breithaupt, president of the road, wants \$40,000 for the railway, but the city will only offer \$25,000.

Buses to Be Tried in Toledo

The City Council of Toledo, Ohio, on recommendation of Street Railway Commissioner Wilfred E. Cann has authorized the Community Traction Company, to increase its capital by issuing \$30,000 of preferred stock to provide funds to purchase four motor buses and provide housing facilities for them, the buses to be used in a service to be added to the Oak Street Railway line. The commissioner plans to purchase Garford equipment, each bus to have a seating capacity of twenty-five passengers.

Alleged Discrimination Stopped

The New York Central Railroad has decided to place the Northwestern Ohio Railway & Power Company on a parity with steam roads at Toledo, Ohio.

The railroad in the past has maintained a reciprocal switching tariff applicable between its tracks in Toledo, Ohio, and those of other steam railroads within the Toledo switching limits. The New York Central absolutely refused to consider switching between electric lines and its tracks on any other basis excepting as from an industry, the rate in which case was several times higher than that shown in its reciprocal switching tariff.

Immediately after the close of the Federal Railroad Administration the Northwestern Ohio Railway & Power Company filed an informal complaint covering this alleged discrimination with the Interstate Commerce Commission.

The conclusion to place the roads on a parity was based on the amount of business offered for interchange at that point and the equipment owned and operated was such as to make it impossible to classify same as an industry.

Mitten—A Hotel Promotor

Thomas E. Mitten, Philadelphia, chairman of the board of directors of the International Railway, Buffalo, N. Y., has subscribed to \$10,000 of stock in the new \$1,000,000 hotel which will be erected in Niagara Falls. The subscription was made on behalf of the International Railway because of the fair treatment accorded the company by the city during the recent railway strike, Mr. Mitten explained. The United Hotels Company will manage the structure. The fund for the erection of the building is being raised by the sale of stock. The Chamber of Commerce and the Niagara County Merchants' Association are co-operating.

Investigation On in Buffalo

Two secret indictments have been returned by the Federal Grand Jury in Buffalo in connection with the government investigation into the dynamiting of a high-speed train on the Buffalo-Niagara Falls interurban division of the International Railway last August. Colonel William J. Donovan, United States attorney for the western district of New York, who is in charge of the investigation being made by the United States department of justice, says the investigation has not yet been completed. Clarence F. Conroy, business agent of the Amalgamated in charge of the strike, was a witness before the Federal Grand Jury for forty minutes.

Whether or not the government investigation involves striking street car men and officers of the union has not been revealed by those in charge of the inquiry. Four men already are under arrest charged with the illegal possession of dynamite. One is Robert C. Lacey, former president of the Central Labor Council and state senator-elect from an East Side district. Lacey now is out under \$5,000 bail. The International Railway Company has offered a cash reward of \$100,000 for information leading to the arrest and conviction of those responsible for the dynamite outrages since the outset of the strike.

\$195,000 for Power Betterments

A definite statement as to the purposes of the Minneapolis (Minn.) Street Railway has been made to the committee on street railways of the local Council by Vice President T. Julian McGill as to 1923 work. The program outlined will include \$195,000 to be put into betterments of the power house, improvements of substations, reconstruction of rolling stock and cable work above and below ground. This leaves out of the renewal fund \$500,000 for track extensions and paving between tracks. Of these extensions have been ordered as follows: Connection between the Twenty-fifth Street line and the Thirty-sixth Avenue line, five blocks, and extension of the latter line, to cost \$170,000; extension of Monroe Street line, \$17,000; Grand Avenue line, \$43,900; Bloomington Avenue line, \$54,500.

The proposed construction of several hundred light-weight cars, already announced, and the completion of other work will mean an expenditure of about \$4,000,000, to cover which the company expects a market for its bonds after the rate decision is made by the State Railroad & Warehouse Commission. The addition of these cars depends, however, on the company getting additional funds.

An attempt of some of the Aldermen in attendance at the meeting to interrupt Mr. McGill was squelched when, in response to a statement by one of these Aldermen, Mr. McGill said that since April 1 no one had been discharged who had worked for the company two years or more.

Salary Expenditures Explained

James Couzens of Detroit recently addressed the annual dinner meeting of the Citizens' league at Grand Rapids. In the course of his remarks he called attention to a number of expense items that indicated an inflated overhead which he claimed bore the greater part of the responsibility for the high rates of fare in the operation of the Detroit street railway system. According to one of the Grand Rapids papers, Senator Couzens, then Mayor of Detroit, aroused the resentment of local city and street railway officials by suggesting that the city might find a remedy for the higher fare by investigating similar items.

In view of this circumstance City Manager Fred H. Locke, in co-operation with Louis J. DeLamarter, general manager of the Grand Rapids Railway, has made a study of many of these items as they apply to the Grand Rapids Railway Company and will publish a continuing report covering these factors as they apply to local charges.

The first of the series, signed by Mr. Locke, follows:

There appears to be some misunderstanding or suspicion in the minds of some citizens relative to the financial affairs of the railway, and inasmuch as the operation of this company has to a considerable extent been placed under the control of the city manager, I will from time to time endeavor to give an account of the conditions as they actually exist.

It has been related that the officials of certain street railway companies through high salaried officers have been milking the companies—that is, that they have taken in this manner from the stockholders and car riders the benefit of the earnings of said companies.

It is reported and it is well known that in some cities large salaries have been and are being paid to the officials of public utilities including street railways.

It has been hinted from certain quarters and by a few local citizens that such may be the condition existing here; in other words, that some of the officials and directors are drawing large salaries at the expense of the car riders.

Under the terms of the franchise all operating and other expenses are subject to the approval of the city commission.

As the city has full access to the books of the street railway company, the facts can be and have been ascertained and verified by an expert accountant for the city.

The total of salaries paid by the local railway to its officials is as follows: President (in New York), vice-president and general manager, secretary and treasurer, assistant secretary and treasurer (in New York), comptroller, \$18,200.

The members of the board of directors receive \$10 each for each meeting attended.

It can be easily seen that the officials of the local street railway are not being overpaid, nor is Wall Street getting a rake-off through the payment of exorbitant salaries.

Action Delayed in Hollywood Case

It is estimated that it will be at least eighty days before the citizens of Hollywood, Calif., may expect any action of the California State Supreme Court on the matter of appeal made by the citizens to the courts for a decision of whether or not the city of Los Angeles or the State Railroad Commission has the power to order the Los Angeles Railway Corporation to extend its lines into Hollywood. It has been proposed that the West Sixth Street, the Vermont Avenue, the Heliotrope and the Temple Street lines be extended.

The Hollywood Chamber of Commerce recently petitioned the State Railroad

Commission to order the Los Angeles Railway Corporation to extend its lines to Hollywood, as now served exclusively by the Pacific Electric local lines, but the state body stated that it was not certain of its authority to issue such order on the railway company, and the city of Los Angeles takes the same attitude under the terms of the existing city charter. Therefore, the matter was appealed to the Supreme Court for decision. Upon receiving the petition the court has requested the Hollywood Chamber of Commerce within thirty days from Dec. 6 to file briefs, the commission being given thirty days to answer and the Hollywood Chamber of Commerce twenty days to file another answer. The Supreme Court will then consider the case.



News Notes

Pamphlet Tells Four Years Story.—The Boston (Mass.) Elevated Railway has issued in pamphlet form the statistics on the four years' results under public operation. These figures were published in the *Electric Railway Journal*, issue of Aug. 5.

Trolley Service Started.—Railway service was recently established between Groton and New London by the Groton & Stonington Street Railway, Norwich, Conn. The line extends over the new Thames River bridge and opens up a service long desired.

Good Slogan Wins Prize.—"Any accident may be fatal" is the new slogan of the Boston (Mass.) Elevated Railway. The author of the phrase, now officially adopted, was awarded a \$10 prize in a contest for employees, recently held by the company and in which a large number of men submitted suggestions.

Power Contract Approved.—The New Brunswick Government has approved a contract between the Provincial Electrical Power Commission and the city of St. John for the delivery of hydro power to the city from the Musquash plant. The signature of Lieutenant-Governor Pugsley has not yet been affixed to the contract.

Safety Week Saves Forty-seven.—The Safety Institute of America has issued its safety week bulletin, which gives the result of that important week in New York City, namely Oct. 8-14. There were only twenty-three deaths due to accidents compared with seventy for the same week in 1921. In other words, forty-seven lives were spared.

Arbitration Will Decide.—Arbitrators will be chosen to settle the differences existing between the Charleston (S. C.) Consolidated Railway & Lighting Company, and its employees. The contracting parties have been unable to reach an agreement with respect to working conditions and wages for 1923.

New Slogan in Fort Wayne.—The Indiana Service Corporation, Fort Wayne, Ind., has adopted an interesting slogan which is being used in all the company's advertising, in all of its literature and on all of its letterheads, billheads, envelopes, etc. This slogan is, "Service Is Our Middle Name."

Will Consider Wage Cut Appeal.—Trustees of the Boston (Mass.) Elevated Railway are expected to consider the appeal of the carmen's union for a postponement of the wage reduction scheduled for Jan. 1. The present arrangement was the result of a joint conference held last May, but according to the union's petition, costs of living have advanced to such an extent that the 2 cents an hour cut would work a hardship on the men. Operators of one-man cars now receive 73 cents an hour and the blue uniformed men 63 cents an hour.

Ordinance Demands "Stop" Lights.—An ordinance requiring the Cincinnati (Ohio) Traction Company to equip its cars with automatic rear stop lights has been introduced in the City Council by Councilman Otto K. Francis. The measure has been referred to the committee on street railways, which has scheduled it for a public hearing. By the terms of the proposed law the traction company is forced to equip half of its cars with rear lights within six months and all its cars with lights within a year. A provision of the ordinance demands that traction cars be operated with automatic stop lights.

Statistics on the First Passenger Railroad.—An account of the bulletin for posting in cars and in other places, issued by the Georgia Railway & Power Company, Atlanta, Ga., called "The Empire State," has been published in previous issues of this paper. The issue of "The Empire State" for Dec. 11 brings out an interesting fact in regard to the first passenger railroad. The bulletin reads: "The first passenger railroad in the world ran from Augusta, Ga., to Charleston, S. C. The first trip was made in January, 1831. Now Georgia has 7,318 miles of railroad track, affording a network intercommunication and abundant outlets to the markets of the world. It is great to be a Georgian."

Speaks on Mitten Plan.—Dr. A. A. Mitten supervisor of industrial relations of the Philadelphia (Pa.) Rapid Transit Company was the speaker at the December meeting of the Industrial Relations Association of Buffalo. His address confined itself largely to the Mitten plan of collective bargaining, but he did touch upon the traction situation in Buffalo. He declared that the International Railway is now employing more men in the operation of cars than before the strike. Dr. Mitten was detailed to special service in Buffalo during the early months of the strike on the local and interurban lines of the International Railway. He was in charge of the health of the men held in carhouse camps and also in the sanitation of the camps.

Financial and Corporate

I.C.C. Act Interpretation

Electric Railways Oppose Steam Railroad Purchase Proposal from California at Washington Hearing

The Interstate Commerce Commission is expected soon to render its decision regarding the application of the Western Pacific Railroad for authority to acquire control of the Sacramento Northern Railroad, an electric system. In the determination of this case is involved a question of widespread interest to electric railroads in having decided the authority of the Interstate Commerce Commission over issuance of securities by interpretation of Paragraph I of Section 20a of the interstate commerce act.

The act, in this section, excepts from the authority of the Interstate Commerce Commission "a street, suburban, interurban electric railway which is not operated as a part of a general steam railroad of transportation." It is in the interpretation of these words that the greatest interest in the pending case rests.

Division Four of the Interstate Commerce Commission some time ago heard some of the questions bearing on this case and rendered a majority decision declaring, in effect, that the Sacramento Northern Railroad is not an interurban electric railroad, but probably an ordinary railroad operated by electricity, and therefore not excepted from the provisions of the law requiring an application to the Interstate Commerce Commission for permission to issue securities. Even if this were not so at present, Division Four held, acquisition of the Sacramento road by the Western Pacific would make it part of a steam railroad system. From this decision, an appeal was taken to the full commission.

At the hearing before the full commission, held on Dec. 6, four arguments were advanced in opposition to the decision of Division Four in interpreting the interstate commerce act, while one attorney appeared with notice that he desired to file a brief against the proposed merger on the basis of public interest if the division's decision were to be reversed. In opposition to the idea of including interurbans of the character of the Sacramento Northern within the securities-supervision jurisdiction of the Interstate Commerce Commission there appeared Carl Taylor of New York, representing the Western Pacific Railroad; Ben B. Cain, Washington, representing the American Short Line Railroad Association; Charles L. Henry, Washington, chairman of the committee on national relations of the American Electric Railway Association, and Frank Karr of Los Angeles, representing the California Electric Railway Association. Charles Warren, Washington, appeared as representative

of Miles Standish, a minority stockholder of the Sacramento Northern Railroad, who opposes the transfer to the Western Pacific. Mr. Warren filed a brief, but made no argument on the point at immediate issue, although expressing approval of the finding of Division Four.

Arguments in favor of overturning the division's decision and against including electric lines within the commission's jurisdiction to supervise security issues were that Congress worded the act because parts of general steam railroad systems were electrified and that it was clearly intended to except interurbans, regardless of whether they handle freight or only passengers. It was shown that there is a difference between "control" and "operate" and that while, if the transfer takes place, the Sacramento Northern will be "controlled" by the Western Pacific, it will not be "operated" by that steam road. The Sacramento Northern does handle freight, but in its other activities is distinctly unlike a steam road.

This case arises because of an offer by the Western Pacific to acquire control of the Sacramento Northern. It was proposed that the Western Pacific issue \$4,180,000 of bonds so that its holding company, the Western Pacific Railroad Corporation, might consummate the deal. Permission for this issue was granted by the Interstate Commerce Commission in May, 1921, but without passing on the question of the right to acquire the Sacramento Northern and with the proviso that further application for such use of the proceeds must be made. It is proposed also that a holding corporation be created for the Sacramento Northern, because not all of its stocks and bonds can be purchased, all the stock in the holding company to be acquired by the Western Pacific Railroad Company as security for issues of securities. The California Railroad Commission has approved the application.

Part of North Shore Property Sold

The property of the New York & North Shore Traction Company, Roslyn, N. Y., outside of the limits of the city of New York, comprising tracks, power plant, cars and other appurtenances, has been sold to David Ziskind & Company, Lowell, Mass., for \$125,000, subject to claims against the company for taxes. The purchaser has started dismantlement. On the part of the property within the city there remains a question to be settled—whether the claims of the city against the company come ahead of those of the bondholders. The receivers, Messrs. Allen and Moran, will remain in charge until the last of the matters in connection with the dissolution has been settled.

Reorganization Effected

West Virginia Property, in Receivership Since 1916, Has New Officers and Directors

New officers and new directors were named for the Morgantown & Wheeling Railway, Morgantown, W. Va., and the control of the road passed out of the hands of those who have held it since 1916 to a new faction which gained control of the majority of the stock at recent meetings of the stockholders, new directors and officers.

A resolution was passed by the stockholders to have the property and assets of the company returned to the stockholders. R. Hugh Jarvis was named vice-president of the company and statutory attorney.

Former Gov. W. E. Glasscock was named chairman of the meeting, with R. H. Jarvis secretary. A committee was named to examine the proxies and the number of shares represented and when those formalities had been disposed of the regular business was taken up.

The directors chosen were J. V. Thompson, Andrew A. Thompson, John R. Thompson, Uniontown; John F. Phillips, W. H. Conaway, Rolfe M. Hite of Fairmont and R. H. Jarvis, Frank P. Weaver and G. P. Russell of Morgantown.

The board of directors at a subsequent meeting named Josiah V. Thompson president, R. H. Jarvis vice-president and W. H. Conaway secretary and treasurer.

The railroad went into the hands of the receiver in 1916 following the institution of a suit by David E. Lemley and others. William E. Glasscock was the first receiver appointed by the court, followed by Raymond E. Kerr, and recently by Samuel Pursglove, the present incumbent.

The last record of a stockholders' meeting is that of Jan. 8, 1916, according to the vice-president.

The affairs of the railroad have been in confusion the past six years and suit after suit has been entered which has kept the case prominent in the court since that time. Large sums have been expended in court costs and attorneys' fees in that time and little if anything has been done to reduce the indebtedness of the road.

Early in the present year Samuel Pursglove, the present receiver, purchased for \$162,500 bonds of the railroad of a par value of \$325,000, with all the interest coupons attached that were held by the County Court. He is also said to have bought up practically all the other outstanding bonds at approximately the same rate and then asked the court, as the biggest creditor of the road, to be appointed receiver in place of Raymond E. Kerr, the incumbent at that time.

This marked the renewed activity in the affairs of the Morgantown & Wheeling which culminated in the reorganization meeting. The matter has been in progress since last April.

Details of Michigan United Reorganization

Outstanding Security Issues to Be Scaled Down Within Limits of Company's Earning Power—Earnings for First Ten Months This Year Sufficient to Pay New Bond Interest 1.55 Times

G. R. Cottrelle, chairman of the bondholders' protective committee, on Dec. 15 announced details of the reorganization plan of the Michigan United Railways, of which John F. Collins, the general manager, has just been made receiver. The statement outlining the plan was addressed to the depositors of the first and refunding mortgage bonds of the company under the bondholders' protective agreement, dated Nov. 8, 1921.

The plan provides for the formation of a new company, which will take over the property and assets of the old corporation. It will have an issue of first and refunding mortgage bonds to be known as Series A, of which \$5,190,500 will be issued in exchange to depositors of the first and refunding mortgage 5s of the present company, and \$1,800,000 will be given in exchange for the bonds of the Jackson & Battle Creek Traction Company.

The new concern will also have an issue of preferred stock, of which \$6,000,000 will be given to depositors of the first and refunding 5s of the present company, while 100,000 shares of no par common will be issued in exchange for securities of the old company and for other purposes of reorganization.

Holders of the \$10,381,000 old first and refunding 5s of the Michigan United Railways will receive 50 per cent of their face value in new twenty-five-year first refunding 5s and 50 per cent in new preferred stock. Holders of Jackson & Battle Creek first 5s and Jackson Consolidated Traction first 5s are to get 100 per cent face value of their holdings in the new bonds. Holders of the \$703,800 debentures will receive one share of new common stock for each \$100 face value of their holdings and the right to subscribe to the new bonds at 85. Those availing themselves of this privilege will receive one share of common stock in respect of each \$50 subscribed and the further privilege of subscribing to additional common stock at \$4 a share.

Present preferred shareholders are to get one-half share of common for each share of old preferred and the privilege of subscribing for bonds at 85 on the same basis as debenture holders with the additional privilege of a second subscription to common at \$4 a share.

Common stockholders are to be given one-fifteenth of one share of new common for each share of old with subscription privileges similar to those of the preferred shareholders.

Subscription privileges under the plan expire on March 1, 1923, and time for deposit of stocks and bonds expires on Feb. 1, 1923.

The Michigan United Railways owns and operates the city street railway system in Kalamazoo, Battle Creek, Jackson and Lansing, Mich., the inter-

urban lines connecting the cities mentioned, and also the interurbans from Lansing to St. Johns and Pine Lake and from Lansing to Owosso and Corunna; a total of 258 miles measured as single track. Passenger terminal stations are located in the main business sections of each city served. Through passenger service between these cities and Detroit is maintained over the lines of the Detroit United Railway from the city of Jackson, and direct connection with Grand Rapids is made through arrangements with the Michigan Railroad. Two hundred and seventy-eight cars are in operation.

The cities served by the company have shown steady and substantial growth, but the general depression which followed the period of war inflation was reflected in a marked degree in this industrial district. During the war years and for some time thereafter, all operating costs rose rapidly and to extreme levels. Further, with the development of good roads through central Michigan, the company has felt increasingly the competition of the unregulated jitney, the motor bus and the motor truck, as well as the diversion of a portion of its passenger business to the privately operated motor car.

A table of the earnings of the entire property and the bond interest charges against the same for the years 1912 to 1921, inclusive, and for ten months of 1922, follows:

Year	Gross Earnings	Operating Expenses*	Operating Income	Mortgage Bond Interest
1912	\$1,649,570	\$1,025,027	\$624,542	\$519,900
1913	1,826,355	1,095,861	730,493	519,900
1914	1,801,696	1,069,263	732,433	527,095
1915	1,777,514	1,080,887	696,627	602,852
1916	2,067,591	1,269,550	798,041	621,969
1917	2,274,757	1,479,921	794,835	620,015
1918	2,320,737	1,751,416	569,321	622,399
1919	2,841,336	2,000,460	840,875	618,630
1920	3,160,152	2,576,600	583,552	620,595
1921	2,846,230	2,392,576	453,653	622,419
10 mos. 1922	2,268,102	1,804,049	464,052	516,113

* Includes taxes, rentals, current maintenance and repairs but not depreciation.

These figures show that the net earnings of the company, without provision being made for depreciation, are not sufficient to carry interest charges. As the reorganization committee points out, this fact, standing alone, shows the necessity of a reorganization of the property and a readjustment of its fixed charges. In addition to this, however, \$1,200,000 face amount of 5 per cent bonds secured by a prior lien mortgage on the interurban division between Battle Creek and Jackson will become due on Jan. 1, 1923. The company is without funds to pay these bonds, and no securities are available with which the bonds can be refunded or which can be sold in the market for a price to produce the necessary amount. Furthermore, all bonds which may be issued for major extensions, betterments and improvements have

been so issued. The company, therefore, is without means to finance extensions and improvements necessary to maintain its present business and develop the property in the future. The company is also in need of a substantial amount of additional cash with which to purchase the equipment presently operated under lease with option to purchase, and to carry on its business.

For these reasons the committee was forced to the conclusion that a reorganization is absolutely necessary and that a plan of reorganization must be devised and executed which in addition to yielding to bondholders the maximum advantage and protection possible, should also place the reorganized company in a position to meet the requirements to which reference has been made. The committee believes that the plan now presented does meet these conditions. Under this plan the interest charges against the property will be reduced to an amount which the earnings of the company should be sufficient to pay when due. For the twelve months periods ended Oct. 31, 1921 and 1922, the earnings of the property applicable to the reduced bond interest charges were as follows:

	1921	1922
Gross earnings.....	\$2,905,777	\$2,736,520
Operating expenses*.....	2,439,658	2,152,312
Operating income applicable to interest.....	\$466,119	\$584,208
Annual interest charges on \$7,780,500 of mortgage bonded debt of the new company at 5 per cent....		389,025
Balance.....		\$195,183

* Including taxes, current maintenance and repairs, but not depreciation, or rentals on equipment now eased but proposed to be acquired in reorganization.

During the first ten months of the current calendar year the net earnings applicable to interest amounted to \$500,733, as against the proposed mortgage bond interest charges for like period of \$324,187, or 1.55 times mortgage bond interest requirements.

Under the terms of the new mortgage additional bonds are made available to the new company for financing necessary betterments, extensions and improvements. New money presently required by the new company will be supplied principally through the sale of \$600,000 new bonds at 85 and accrued interest.

In a statement which he issued at Jackson Mr. Collins, the receiver, said in part:

It is my intention to give service, same as heretofore, in the territory that I am acting as receiver for, providing the earnings will warrant the expenditure of operation in the future.

When the Saginaw-Bay City Railway went into receivership, and later into bankruptcy, the receiver appointed ceased service, owing to the fact that the earnings did not warrant its continued operation.

It is to be hoped that the lines of the Michigan United Railway will be patronized by the traveling public to provide sufficient funds to warrant operation, and that service can be continued.

A great many street railroads throughout the United States are now in the hands of a receiver, this being brought about by the high cost of labor and material, as well as the development of automobiles, which have deprived the railways of a large amount of their previous earnings. Trucks and motor

buses being furnished free use of the highways by the taxpayer, handle a certain proportion of the freight and passenger business which heretofore went to the electric lines, as well as to the steam lines.

The receivership does not include the Michigan Railroad, which operates three interurban divisions between the following points: From Battle Creek to Allegan, Kalamazoo to Grand Rapids, Grand Rapids to Holland and Sangatuck, and from Bay City to Flint, which latter interurban division operates through cars to Detroit. J. F. Collins is vice-president and general manager of these three interurban divisions of the Michigan Railroad.

Second Year Under Service-at-Cost More Successful

The New York State Railways in its second year of operation under service-at-cost in Rochester, fell short of reaching a full 6 per cent return by \$94,000. This is the amount of return guaranteed to the company by the contract on the valuation of its property fixed at \$19,298,602. The second annual report of Charles R. Barnes, city commissioner of railways, for the year ended July 31, 1922, submitted recently to the City Council, shows that the deficit for the second year is \$38,999 less than it was a year ago. The total deficit is now \$227,000. The report states that the lower deficit for the second year is encouraging in view of the promise it gives for a reduction in fare.

Total revenues amounted to \$5,105,650, according to the report, while costs are shown to total \$5,199,651.

The company received \$1,156,098 as its return on its investment in Rochester. Under terms of the service-at-cost contract, the company gets a sliding scale of return each month on its total investment based upon the rate of fare. At a 7-cent fare rate, the company gets a return of 6 per cent. The base valuation as of July 31 was \$19,298,602.

Operating expenses of the company totaled \$3,725,000; taxes, \$306,000. Total passengers carried numbered 98,976,000 and transfer passengers 23,731,000.

During the year \$240,267 was put aside in the renewal and depreciation fund. Under the contract 2 per cent of the base value is charged off to this item. Last year \$145,833 was so put aside. Of this total, \$386,100, there remains \$182,532 still on hand. Under the fund account, also, there is \$135,144 on hand, the total cash on hand in various funds exceeding the present total deficit for the two years of operation under the service-at-cost plan. It is this fact which proves most satisfactory to city authorities, and gives rise to the hope that a reduction in fare soon may be realized.

Mr. Barnes tells about the studies of car service and the improvements made resulting in regularity of car movement.

According to the report accidents were greatly reduced. The number for the first year under the service-at-cost plan was 5,733 against 5,355 for the second year.

Operation Under Reorganization in Prospect

A final step in the negotiations looking toward a reorganization of the Atlantic Shore Railway, Sanford, Me., will be the decree in the United States District Court foreclosing several mortgages on the property.

Agreements have been made between all parties holding mortgages and the bondholders as well, to accept, after surrendering their securities, a proportional part of a new issue and to start a new operation of this railroad system with some prospect of success. Almost nine months ago efforts were started to accomplish this result and many conferences and short hearings have been held.

In order to salvage all that was possible for these investors, to give assurance of continuing the road as a going concern, it was essential that a single agreement be reached. That was done recently and decrees were drafted and submitted to Judge Peters, now busily occupied in the civil case on trial in the District Court.

Railway January Maturities Total \$7,997,000

In the public utility field corporate maturities for January total \$34,259,600, according to the *Wall Street Journal*. Many small amounts are included in this figure. The bonds of the electric railway companies which will be realized in January, 1923, amount to \$7,997,000 and are listed herewith:

Jan. 1 Ohio Traction notes.	7	\$1,878,000
Jan. 1 Lake Shore Electric Railway cons.	5	1,630,000
Jan. 1 Jackson & Battie Creek Traction 1st.	5	1,200,000
Jan. 1 West End Street Railway 1st	4½	700,000
Jan. 1 Charleston City Railway 1st	5	680,000
Jan. 1 Milford & Uxbridge Street Railway 1st.	5	335,000
Jan. 1 Eastern Mass. Street Railway ref.	6	300,000
Jan. 1 Jamestown Street Railway 1st	6	300,000
Jan. 1 Jersey City & Bergen Railroad 1st.	4½	258,000
Jan. 1 Interurban Railway deb.	6	250,000
Jan. 1 Webster, Monessen, Belle Vernon & Fayette City Street Railway	6	250,000
Jan. 1 Oskaloosa Traction & Light 1st	5	216,000
January total		\$7,997,000

Securities Sold at Auction

Electric railway securities sold by Adrian H. Muller & Company on Dec. 6 at the Public Auction Room, 14 Vesey Street, New York, were as follows:

\$25,000 Oakland Railways Co. collateral trust 6% bonds, 1913, certificate of deposit; per cent	45½
\$2,000 Milford & Uxbridge Street Ry. first mortgage 5s extended to 7% bonds, 1923; per cent	58
\$6,000 Columbus & Ninth Avenue R.R. first mortgage 5% bonds, 1933, certificates of deposit; per cent	14
\$7,000 Columbus & Ninth Avenue R.R. first mortgage 5% bonds, 1933, certificates of deposit; per cent	15
\$30,000 28th and 29th Street Railroad Company first mortgage 5% stamped bonds certificates of deposit; lot	\$20
\$28,000 Chicago Elevated Ry. Co. 6 per cent deb. bonds, 1924, with coupon attached; per cent	14
1,000 shares Chicago City and Connecting Ry. Co. collateral trust participating preferred certificates; per share	\$3.50



Northern Ohio Bonds Offered.—The National City Company, New York, N. Y., is offering an issue of \$1,000,000 general and refunding mortgage 6 per cent bonds, Series A, of the Northern Ohio Traction & Light Company, Akron, Ohio, due in 1947, at a price of 94 and accrued interest, to yield 6½ per cent.

Authorized Issue of Preferred Increased.—The directors of the Standard Gas & Electric Company, Chicago, Ill., have authorized the issue of \$2,460,000 new 8 per cent cumulative preferred stock of \$50 par value to take care of various conversion privileges of the company's funded debt and to provide capital for increased business. Stockholders rights to subscribe will expire Jan. 31, 1923.

Holding Company Preferred Offered.—Bonbright & Company, New York, N. Y., head a syndicate which is offering an additional \$5,000,000 of 6 per cent cumulative preferred stock of the Electric Bond & Share Company. The offering price is 97 and accrued dividends, from Nov. 1, 1922, to yield about 6.20 per cent. The proceeds will be used to expand the business of the company and for general corporate purposes. Upon completion of the sale the company will have outstanding \$16,200,000 preferred stock of an authorized issue of \$20,000,000.

Venner Verdict Affirmed.—The Appellate Division of the Supreme Court in the matter of Clarence H. Venner against the Interborough Rapid Transit Company, New York, N. Y., has affirmed the judgment of Justice Davis of the special term of Supreme Court in substance granting to Mr. Venner a judgment against the defendant for \$25,000 with interest at 7 per cent, from Sept. 1, 1921. The plaintiff was owner of twenty-five promissory notes of \$1,000 each carrying 7 per cent interest, issued by the defendant as part of \$33,400,000 of notes, dated Sept. 1, 1918, due Sept. 1, 1921.

Change in Stock Provisions Approved.—The stockholders of the Public Service Corporation of New Jersey, Newark, N. J., have approved the change in the charter dividing the authorized \$50,000,000 preferred stock into two classes—one of 250,000 shares, 8 per cent cumulative preferred, and the other of 250,000 shares, 7 per cent cumulative preferred. This change is in accordance with the recommendation of the directors. They felt that there would be times hereafter when it would be practicable for the corporation to sell 7 per cent preferred stock. Reference to the intended change was made in the issue of the *Electric Railway Journal* for Nov. 25, page 862.

Traffic and Transportation

Railway Offers Five-Cent Fare as Experiment

The city of Bellingham has been granted a 5-cent fare on its car lines, according to a voluntary offer of the Puget-Sound Power & Light Company. Under the provisions of the company's offer, the fare will be tried out as an experiment for ninety days, and the company will sell tokens at the rate of twenty for \$1, valid until used by the buyer. It was planned to put the new arrangement into effect on Dec. 17.

The company's action came as a complete surprise to city officials, who four months ago had conferred with company officials in an effort to reduce the fare, and had finally agreed to let the matter rest for a time. Under the new plan, the passes now in use will be discontinued and every one will be requested to use tickets. The traction company will undertake an extensive advertising campaign to popularize the new system, with the hope of making the idea a permanent one. In a letter addressed to the City Council, notifying that body of the new carfare, the company, through Manager Harry B. Sewall of the Bellingham division, calls attention to the fact that with the exception of the commutation tickets provided for no other changes in fare will be undertaken, the cash fare remaining at 7 cents for adults and 2½ cents for school children.

Attention was also called to the fact that when the city and company officials conferred on fare problems in September the Council was "not unwilling to approve of such tickets being limited to certain hours in the morning; that is, from 6 to 9 o'clock, and certain hours in the evening, from 4 to 7," but that the company had decided that no limitation of hours in which the reduced fare might be used would be set.

It is pointed out that the ninety days embracing the holiday season and the period of inclement weather would naturally be the most favorable period in which to determine whether such a rate will, as the City Councilmen believe, justify the substantial carfare reduction. Company officials express doubt that the expected increase in travel will offset the reduction in rates, but state that if such increase develops the 5-cent tickets will be continued.

Fare Increase Refused

Expressing the view that with service changes and economy a reasonable return can be earned, the Railroad Commission of California has dismissed the application of the Bakersfield & Kern Electric Railway for an increase in fares in Bakersfield. In the event that conditions should make impossible the expected savings, the company will be permitted to renew its application.

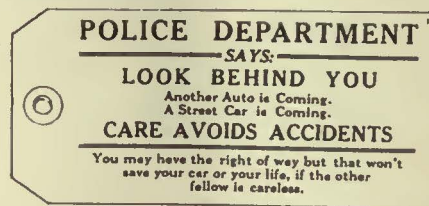
The commission found a rate base of \$568,314 upon which it was calculated the company is earning at the present time the rate of return of 3.52 per cent. With suggested savings in operation this return, it was computed, could be increased to 5.82 per cent. The commission was urged by the Boosters Club to order an extension of the system to serve East Bakersfield, but no order was made on this matter pending a separate consideration of grade crossing problems involved.

In commenting on this matter the commission said:

This commission has, we believe, the power to order an extension, but such an order cannot be made where the evidence indicates the extension would be operated at a loss, and as to an increase in fare designed to take care of such a loss, it must be obvious that this cannot be determined until the cost of the facilities necessary is found, and since the crossing of the Southern Pacific may add to the costs above stated, it is impossible at this time even to estimate the added operating costs which will undoubtedly result from rail service into East Bakersfield.

Tags for the Purpose of Accident Prevention

The tag reproduced herewith is part of the Accident Prevention work carried on by the Elmira Water, Light & Railroad Company, Elmira, N. Y. The



company had the tags printed and is having them tied on the steering wheels of all automobiles in the downtown section.

Hearing Held on Freight Traffic Discontinuance

Public Service Commissioner William R. Pooley has reserved decision on the application of the International Railway, Buffalo, N. Y., to abandon its freight traffic in western New York. The company asks to discontinue this arm of its service altogether. C. P. Franchot, counsel for the International, explained that the purpose of the move was to cease making a gift to shippers of service at less than cost and to cease to lay the burden incurred by this business on the passenger business.

Several representatives of Chambers of Commerce in western New York attended the hearing and there was some objection to the railway's plan. The International maintains a freight and express station at Main and Virginia Streets and operates a number of inter-urban freight and express cars between Buffalo, Niagara Falls, Lockport and Olcott and intermediate points.

Passenger and Freight Interchange Arranged

Arrangements have just been completed between the Nickel Plate (steam road) and the Northern Ohio Traction & Light Company (electric system) whereby freight and passengers will be handled from points on the Northern Ohio Traction & Light Company's lines to Chicago and intermediate points on the Nickel Plate and to points west and south of Chicago over connecting steam lines. This is one of the few arrangements of its kind to be perfected in this country between an electric line and a steam road. The tariffs were filed with the Interstate Commerce Commission on Dec. 15 to become effective on Jan. 15, 1923. This action on the part of the Northern Ohio Traction & Light Company opens the way for freight shipments from points on its lines to all points west via the Nickel Plate.

Commission Reports Further on Traffic Congestion

In connection with the activities and surveys of the Los Angeles Traffic Commission to determine practical methods and schemes to be adopted for relieving the traffic congestion in the business district of the city of Los Angeles a recent survey just concluded by the commission reveals some very interesting data in connection with these conditions. Following are some of the contributory causes of congestion, which include the growth of the city and the increase in number of automobiles.

In 1919 there were 62,000 automobiles registered in the city of Los Angeles. On Dec. 1, 1922, the city's automobile registration was in excess of 165,000. In the 1900 government census Los Angeles ranked as thirty-fifth in population among the cities of the United States. The government census of 1920 ranked Los Angeles the eleventh largest city in population.

During October, 1922, a total of 4,079 traffic accidents were recorded in Los Angeles by the police department, as against 2,047 in October, 1921.

In 1921 the death rate from automobile accidents in Los Angeles per 100,000 population was 27.9, as against:

For the whole United States.....	11.5
Average of all large cities.....	15.0
Manhattan	18.8
Chicago	20.3

Based on recent checks, the following volumes of traffic are handled daily between the hours of 5 to 6 p.m. at Seventh and Broadway:

Pedestrians	18,000 to 20,000
Automobiles	1,200 to 1,400
Street cars	320 to 350

The intersection of Seventh and Broadway handles the largest volume of automobile traffic in the downtown district. From 7 a.m. to 6 p.m. shows a total of 13,468 passing automobiles.

Fifth and Broadway is the busiest intersection in point of pedestrian traffic, checks showing a maximum of approximately 25,000 pedestrians per hour, as against a maximum of 23,000 at Seventh and Broadway.

Company Will File Supplementary Brief

A delay of sixty days or longer is likely before a decision is made in the litigation arising out of the fare fight in Fort Worth, Tex. This is indicated in the announcement by counsel for the Northern Texas Traction Company that the company would file a supplementary brief. The case was recently heard before N. A. Dodge, special master, who gave attorneys for both sides thirty days in which to file briefs in the case.

In the litigation, the city of Fort Worth seeks to compel the Northern Texas Traction Company to reduce fares from 7 cents to 5 cents claiming that increased patronage arising out of a 5-cent fare would more than offset the reduction in revenue brought about by a reduction from 7 cents to 5 cents. Under its franchise provisions, the Northern Texas Traction Company can charge any fare deemed adequate to produce a fair return on the invested capital, and during the period of high prices and low revenues the company announced a 7-cent fare. The city at once began a fight to compel a reduction, whereupon the company went into Federal Court to seek relief, setting forth that a 5-cent fare is confiscatory and that a 7-cent fare is necessary to produce a fair return on the invested capital.

N. A. Dodge was appointed as special master and after extensive hearings, in the course of which all phases of the operation of street car lines in Fort Worth were investigated, announced that he would give counsel for both sides thirty days in which to file briefs, after which he would render his decision. These briefs were filed nearly a month ago, and now before the referee has rendered his decision comes the announcement from the traction company that it will file a supplementary brief.

Recommends Consolidation With Uniform Fare

The question of uniform street car rates in the Twin Cities (Minn.) has come to a head in St. Paul in the report of the subdivision on public utilities of the St. Paul Association of Public and Business Affairs, as approved by the board of directors. This report reads:

1. The subdivision on public utilities is agreed that it is important that the rates of fare for street railway transportation shall be uniform in the cities of St. Paul and Minneapolis.

2. The subdivision recommends a consolidation into one operating company of the St. Paul City Railway Company, the Minneapolis Street Railway Company and subsidiary companies operating street railway lines within, between and out of the cities of St. Paul and Minneapolis and that a metropolitan transit district be established which shall consist of all territory now being served for one fare by the Minneapolis Street Railway Company combined with all territory now being served for one fare by the St. Paul City Railway Company, in which said metropolitan transit district only a single fare shall be collected from any point to any other point therein, together with transit privileges to all connecting lines.

It is apparent a proper solution of this situation cannot be accomplished without a unification or consolidation of these lines.

Their unification or consolidation is an absolutely necessary essential to accomplish any of the objects above specified. Without such action the Railroad & Warehouse Commission is without power to fix such uniform rates and, even if it were by legislation given the power, the grant in our opinion would be invalid.

The fare in either city is now 6 cents, to the city limits separating St. Paul and Minneapolis, but the fare in either city has been determined in the past by City Council action. Under the new law of the state the Railroad & Warehouse Commission has the power of establishing a fair fare rate return on the valuation of the property of the railway, so that the 6-cent fare rate in the Twin Cities is now an emergency or temporary rate until hearings shall be set and accomplished on the property valuations to be presented to the commission for action.

Speed Limits Fixed—Limited Service Continued

A speed limit has been fixed by the Massachusetts Department of Public Utilities for the cars of the Springfield Street Railway and the Holyoke Street Railway, over a section where the service and the speed became a matter of investigation.

The residents of a section of West Springfield and the residents of a section of Holyoke, Mass., asked for the discontinuance of the limited stop service between the two cities, and a speed limit of not more than 20 m.p.h.

In its investigation the department found that the cars operating on the limited stop basis had the tracks on the side of the road, where there are not many buildings and not many grade crossings, and it decided that 25 m.p.h. would be reasonably safe. It issued an order to this effect, and that the cars should reduce to 10 miles at certain crossings, to 5 miles when approaching school children and come to a stop before passing a car loading or unloading. The petition that the limited service be discontinued was dismissed.

An investigation of accidents covering 1,495 days before the limited stops arrangement went into effect in West Springfield showed seventy-seven accidents; during the 1,495 days after the limited stops were adopted there were eighty-three accidents, but forty-two of them were due to local cars. There were 6.29 accidents per 100,000 car-miles with limited stops and 8.82 accidents per 100,000 car-miles with local cars.

Buses Replace Cars

A new era in city transportation began in Everett, Wash., on Dec. 1, when the first gasoline-power buses replaced some of the electric street cars of the Puget Sound International Railway & Power Company with a 5-cent fare on the buses and on all electric lines, and the weekly \$1 pass on all street car lines. The motor buses started on the Colby Avenue line first, the new service extending considerably beyond the outward terminal of the electric line, giving service to new territory.

Transportation News Notes

Seeks to Operate Buses.—The South Carolina Gas & Electric Company, Spartanburg, S. C., has petitioned the City Council to operate buses in connection with its local railway system.

Reduced Transfer Charge Allowed.—The Alabama Public Service Commission has granted permission to the Mobile Light & Railroad Company, Mobile, Ala., to reduce its transfer charge from 2 cents to 1 cent. The company applied for this privilege on Oct. 18.

"Stop" Signs on Cars.—The Nashville Railway & Light Company, Nashville, Tenn., is equipping its cars with semaphore signs reading "stop." This act is the latest move on the part of the railway company to lower the number of street or traffic accidents. The "stop" signs will serve as signals to automobile drivers not to pass a standing car.

Rule of Road Changed.—On Dec. 1 the rule of the road was changed from left to right in New Brunswick. The car lines in Moncton and in St. John and suburbs were changed to the right drive and the cars were operated vice versa from the way they have always been operated in New Brunswick. It is believed that accidents can be reduced to a minimum by the advertising campaign that is being conducted by the New Brunswick Department of Public Works.

5,965 Passes per Week.—The sale of weekly tickets by the Indiana Service Corporation in Fort Wayne, Ind., has reached a maximum of 5,965 per week, according to Robert M. Feustel, president of the corporation. This figure was reached in the forty-first week of the system. Officials of the company expect the sale will reach the 7,500 mark in a few weeks. A campaign is now on to increase the sales to 10,000 per week. The first week in which the pass was in use the sale totaled 2,800.

Proposes Seven-Cent Fare.—A new proposition has been placed before the City Council of Danville, Va., by the Danville Traction & Power Company. Instead of urging the one-man car issue, which has been before the Council and the public for the past three months, the company through its president, C. G. Holland, proposed that if the Council were unwilling to sanction use of one-man cars the company would be satisfied with a 7-cent cash fare and with the present ticket rate of five for 30 cents. The Council, therefore, voted to adopt a resolution providing for the publication of a change in the ordinance raising the cash fare from 6 cents to 7 cents. The Council at the same time charged the finance committee with making a definite recommendation as to the one-man car or the 7-cent fare.

Personal Mention

Mr. Harton Heads Kentucky Operators

William H. Harton, Newport, was elected president of the Kentucky Association of Public Utilities, at Lexington, Ky., Dec. 12. Mr. Harton is general manager of the South Covington & Cincinnati Street Railway with offices in Covington. He was promoted to this office after having served for several years as superintendent of transportation. He has been with the Green Line company for many years, and has reached his present position through a series of promotions resulting from efficient service. He is one of the active members of the Covington Rotary Club. He was one of the organizers of the Covington Penny Clinic, and acted as treasurer of that organization during the campaign to raise funds to establish the clinic. Mr. Harton is widely known in transportation circles.

Change in Pacific Electric Personnel

C. Mort Stuart, manager of the Pacific Electric Railway Company Club, Los Angeles, Calif., has resigned to enter other fields. N. B. Vickery has been appointed to the position vacated by Mr. Stuart. H. D. Priest has been appointed manager of Alpine Tavern Resort as operated by the company at the terminus of its Mount Lowe line, vice Mr. Vickery. N. B. Vickery commenced service with the Pacific Electric lines in 1905, serving in various capacities until his appointment as manager of Alpine Tavern in February, 1916. Mr. Vickery was one of the original organizers of the Pacific Electric Club, which places him in a familiar position with his new duties.

H. D. Priest, who succeeds Mr. Vickery as manager of Alpine Tavern, entered the services of the company in the passenger department in the year 1916. Previous to his present appointment he was employed as traveling passenger agent. In his new position he will return to a field of endeavor in which he has had much experience, having followed hostelry work for many years previous to his connection with the Pacific Electric Railway.

Glenn H. Shaw with Northern Ohio Company

The Northern Ohio Traction & Light Company established an accident prevention department with Glenn H. Shaw, formerly of the Cleveland Railway, in charge. Associated with Mr. Shaw as accident prevention supervisors are Charles Speigle for the northern division; C. J. France for the Akron city lines; H. L. Farmer for the southern interurban division, and

Hugh Wilson for Canton and Massillon city lines.

The plan calls for committees from various departments of the system to work in conjunction with the superintendent and supervisors. There is also an executive committee, consisting of the head of the railway, light and power and commercial departments in conjunction with the general manager.

Mr. Reynolds Resigns

Manager of United Traction and Hudson Valley Railways, at Albany, Retired on Dec. 16

Albert E. Reynolds, general manager of the United Traction Company, Albany, N. Y., resigned on Dec. 16 to



A. E. REYNOLDS

enter other business. The successor to Mr. Reynolds is Ernest G. Murphy, who has been assistant general manager.

Mr. Reynolds began his street railway career in Plattsburgh, N. Y., and was for several years manager for the Plattsburgh Traction Company, a subsidiary of the Delaware & Hudson Company, his management of that system being such as to attract the attention of the officers of the holding company, and in recognition of his valuable services they promoted him to the management of the Hudson Valley line, with headquarters at Glens Falls. At the time that he assumed the management of the affairs of this company conditions along the line were anything but pleasant and encouraging. The company had in some manner secured the enmity of many of the people along the line, and the system was not in the best of shape. He set about at once to correct these things and quickly succeeded in doing so.

With the reputation thus established it was quite logical that Mr. Reynolds should be appointed in 1917 to succeed Charles F. Hewitt as general manager of the United Traction Company, for both that company and the Hudson

Valley line are controlled by the Delaware & Hudson Company. Upon the resignation of Mr. Hewitt, Mr. Reynolds in fact, received the title of acting general manager at Albany, but in February, 1918, was formally made manager. Thereafter he continued in charge of both the Hudson Valley Railway and the United Traction Company with offices in Albany.

Cited for Bravery

Willard Cope, secretary of the committee on public utilities information of Atlanta, and former newspaper man in Atlanta, was paid a glowing tribute by the Georgia Industrial Commission in a report awarding Mr. Cope compensation under the recent workmen's compensation act for injuries suffered in a railroad wreck some months ago. At the time of the accident Mr. Cope was on duty as a reporter for an Atlanta newspaper. He was pinned beneath the wreckage in such a way that his entire body except his head was submerged beneath the water. At the same time he was badly crushed and bruised, his left leg was broken and his shoulder fractured. When rescuers arrived he told them to get the women and children out first. It was several hours before Mr. Cope was finally extricated. As a result of the injuries he received in the accident Mr. Cope was confined to his bed in the hospital four months. The report of the commissioner, Hal M. Stanley, said:

"We have here one of the most conspicuous examples of bravery that has been brought to the attention of the Industrial Commission since the Georgia workmen's compensation act was enacted into law."

Detroit Work Divided Among Commissioners

William B. Mayo, chief engineer for Henry Ford, will not assume the management of the Detroit Municipal Railway, as was stated in newspaper articles, but will take over only part of the duties in the same manner as the other two commissioners.

Mr. Mayo has been a member of the commission for some years and the work of the street railway department has been divided so that he, G. O. Ellis and H. H. Esselstyn, the other commissioners, will participate in the management.

The three commissioners have arranged to divide the work as a temporary plan to be worked out for thirty days. The city will construct fifty new trailers in the Highland Park shops and it is understood that Mr. Mayo will assume supervision of this work. A. C. Colby, superintendent of equipment, will be actively in charge of this work. Ross Schram, assistant general manager of the Municipal Railway, also announced that the city was considering the advisability of constructing its own motor cars.

The commission also will institute a plan whereby motormen will receive a bonus for the safe operation of their

cars. This plan is being instituted by the commission as a means of preventing accidents.

Mr. Brooks Goes Into Automobile Business

Charles A. Brooks, local manager of the Poughkeepsie City & Wappingers Falls Electric Railway, Poughkeepsie, N. Y., has resigned from that company to go into the automobile business for himself in that city. He will act as local agent for a well-known make of car and in addition conduct a general supply and repair business. This is a logical move by Mr. Brooks. He has long been an auto enthusiast, and this with his long experience in mechanical work make a rare combination of talent. It is nearly ten years since Mr. Brooks entered the employ of the local railway at Poughkeepsie. In fact, it was in April, 1913, to be exact, that he entered the service of the company there. Before that he had been engaged in similar work, mostly on the mechanical side, with the Third Avenue Railway, New York, the South Shore Traction Company, New York, and on properties in the Central West.

James P. Barnes, president of the Louisville (Ky.) Railway, has been nominated for re-election as a director of the Louisville Industrial Foundation, the so-called \$1,000,000 factory-getting enterprise of Louisville. It was founded a few years ago to aid in bringing industries to the city.

Obituary

W. B. Everest, general traffic manager of the Westinghouse Electric & Manufacturing Company, died on Dec. 5. He had been holding the position of general traffic manager since 1914.

William C. Smith, for many years claim agent for the International Railway, Buffalo, N. Y., is dead. Mr. Smith resigned from the International Railway some years ago and at the time of his death he was associated with the Merchants' Mutual Casualty & Liability Company of New York City. He was fifty-two years old. Mr. Smith was a graduate of the Buffalo Law School and played an active part in Masonic affairs in Buffalo.

Gen. Luke Wright of Memphis, Tenn., eminent lawyer, is dead following an illness of several weeks from paralysis. General Wright had served as Secretary of War, Ambassador to Japan and Governor-General of the Philippine Islands in his relation to the federal government. Before that he had served as attorney general of Shelby County and practiced law with great success at the Memphis bar for a decade. General Wright served as counsel for the Memphis Street Railway and was a director of the Memphis *Commercial Appeal*.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE
MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Production Advancing

Continued advances in production, transportation and distribution in November are noted in figures compiled by the Department of Commerce in its "Survey of Current Business." The largest consumption of cotton since 1917, and further high records since 1920 in the output of pig iron, steel ingots, zinc, coke, locomotives, and upper leather, emphasize the sustained and basic character of industrial production in November. The usual seasonal decline in building contracts in November failed to materialize.

The car shortage on the railroads was slightly relieved, but coal cars were still in great demand and coal loadings have been kept up to the maximum; total loadings of all classes were very high for November. Increased orders were made for locomotives and freight cars to overcome congestion.

Price levels continued to increase in November, with both the total wholesale and the retail food indices the highest since the end of 1921.

The final crop reports for the year 1922 indicate a large production of the principal crops, especially wheat, potatoes, corn and rye, and should make for increased prosperity in the farming sections.

Seek Authority to Purchase Sixty More Cars

The Pittsburgh (Pa.) Railways, through Receivers Fagan, George and Tove, has petitioned the court for authority to purchase sixty more cars, making a total of 125 new cars costing \$1,450,000 within two years.

The sixty new cars are expected to cost \$660,000. They will be delivered as completed during the next six months.

As the seating capacity of each car is fifty-nine passengers, the 125 new cars, those already purchased and put into service, with the sixty to be ordered now, provide 7,375 additional seats.

The new cars, like the previous purchases, will be the standardized double-truck, low-floor, low-step cars, with automatic doors and other approved equipment.

"A1" Green Returns to Galena Company

Galena Signal Oil Company, Franklin, Pa., has announced the return of A. A. Green to the position of sales and engineering representative. Mr. Green has long been connected with the industry, first on the operating and then for a number of years on the supply side. After passing thirteen years with the Galena organization, in 1917 he went over to the

Columbia Machine Works, Brooklyn, as general sales manager, from which position he returns to the Galena company. He has been associated with the Brush Electric Company, the Memphis Electric & Power Company and the Rochester Railways, now known as the New York State Railways. Mr. Green has made a special study of the subject of lubrication and has contributed articles on that topic to this paper.

New Freight Equipment for Pacific Electric Railway

Rapid growth of its freight business necessitates the Pacific Electric Railway, Los Angeles, Calif., placing orders for new freight equipment, representing an approximate expenditure of \$1,500,000.

The present freight equipment will be augmented through the purchase of 400 new dump cars, 150 flats and 200 box cars. A new freight switching electric locomotive is being constructed in the company's shops at Torrance, which will be a duplicate of the present 1,600 class type of freight locomotive used on the company's lines. A steam switching locomotive has just been purchased and placed in service at Los Angeles harbor to assist the present gas-electric locomotives now used by the company at that point in switching at the municipal docks and on the municipal tracks of Los Angeles, all of which switching is performed by the Pacific Electric Railway for the city of Los Angeles and the steam road lines serving the harbor.

United Electric Railways Installs Automatic Block Signaling

The United Electric Railways, Providence, R. I. is installing automatic block signaling on its line between Providence and Woonsocket. The complete installation involves a total of thirty-two protected blocks using signals of the Union color light type, Style "N" with all units provided for three color indications. Ten "DW" Automatic Flagmen (3 aspect) with Crossing Bells, all operating on alternating current, are being installed at various highway crossings in this territory and are incorporated as a part of the signal system.

The entire installation is supplied with energy by means of 2,300-volt 25-cycle, single-phase transmission which will be served from a transmission located approximately in the center of the signaled territory. The Union Switch & Signal Company has the contract for the complete erection of this signal system.

Westinghouse to Decide on Huge California Plant

Whether a \$1,000,000 assembling plant for the Westinghouse Electric & Manufacturing Company shall be built in Los Angeles or at a point on the San Francisco Bay will be decided, says information from the East, by officers of the company at New York. H. D. Shute and H. P. Davis, vice-presidents of the electric manufacturing company, are just returning to the East after a visit to the Pacific Coast, where they have been investigating their interests, having visited Los Angeles and San Francisco, where were presented to them the claims of both cities as to advantages as the Western distributing point for the company. The Westinghouse company has already established in Los Angeles its general Western offices and headquarters and has just completed the erection of large buildings in San Pedro Street to serve those purposes.

Large Track Projects Completed

The New York State Railways, Rochester, N. Y., during its second year of operation under the service-at-cost plan completed the following track projects:

1. Construction of track in Clinton Avenue north, Norton Street to Ridge Road; 4,800 ft. of track.
2. Reconstruction of track in Clinton Avenue south, Court Street to Monroe Avenue; 625 ft. of track.
3. Reconstruction of track in Central Avenue; 1,050 ft. of track.
4. Reconstruction of track in Main Street east, Winton Road to Culver Road; 9,940 ft. of track.
5. Replacement of light tee rail on Charlotte line with heavy tee rail; 4,500 ft.
6. Replacement of wood-block paving along rails in Genesee Street; 10,200 ft. of track.
7. Installing cross-over in Central Park, near North Goodman Street.

Increase in Power Resources

An increase of 30 per cent in the total power resources of the Indiana Service Corporation, Fort Wayne, Ind., is reported with the placing in full commission at the power house in Fort Wayne of the new 6,000-kw. steam turbine, which has been under construction for several months. The addition of this equipment gives the plant a total of 20,000 kw. capacity. Installation of a 12,500-kw. turbine, at a cost of \$500,000, during the coming year is also being considered by the traction company officials.

Metal, Coal and Material Prices

Metals—New York		Dec. 19, 1922
Copper, electrolytic, cents per lb.	146.25	
Copper wire base, cents per lb.	16.50	
Lead, cents per lb.	7.25	
Zinc, cents per lb.	7.30	
Tin, Straits, cents per lb.	38.125	
Bituminous Coal, f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$7.875	
Somerset mine run, Boston, net tons	4.125	
Pittsburgh mine run, Pittsburgh, net tons	2.625	
Franklin, Ill., screenings, Chicago, net tons	2.70	
Central, Ill., screenings, Chicago, net tons	2.00	
Kansas screenings, Kansas City, net tons	2.50	
Materials		
Rubber-covered wire, N. Y., No 14, per 1,000 ft.	6.50	
Weatherproof wire base, N. Y., cents per lb.	16.50	
Cement, Chicago net prices, without bags	\$2.20	
Linseed oil (5-bbl. lots), N. Y., cents per gal.	93.00	
White lead, (100-lb. keg), N. Y., cents per lb.	12.125	
Turpentine, (bbl. lots), N. Y., per gsl.	\$1.38	

Rolling Stock

Maumee Valley Railway, Toledo, Ohio, has ordered seven one-man cars from the Cincinnati Car Company.

Interborough Rapid Transit Company, New York, N. Y., plans to convert 465 cars with new conveniences and comforts. The new cars will have vestibules and sliding doors with glass panels.

West Penn Railways, Pittsburgh, Pa., has placed an order for 161 Economy watt-hour meters with car inspection dials for use on its coke region and other divisions. This order follows earlier purchases totaling seventy-four Economy meters.

Boston (Mass.) Elevated Railway has placed an order for thirty motor equipments and control with the General Electric Company. These equipments will be General Electric 264A motors and K-71 control. They are intended for use on some of the cars the railway is now having built at the plant of the Laconia Car Works.

Los Angeles (Calif.) Railway has ordered twenty-five more cars of the two-car train type. The bodies and trucks are being purchased from the St. Louis Car Company and the electrical and air brake equipment will be installed at the South Park shops. The cars cost in excess of \$15,000 each. Delivery of the cars is scheduled to start next May. This order will give the Los Angeles Railway 100 cars which will be suitable for two-car train operation.

Track and Roadway

Salt Lake, Garfield & Western Railway, Salt Lake City, Utah, has extended its lines to Garfield, Utah.

Hydro-Electric Commission, Windsor, Ont., has been authorized by the City Council to proceed with the construction of a single track on Sandwich Street east. Work is already under way.

Little Rock Railway & Electric Company, Little Rock, Ark., is spending \$70,000 on new rails and construction work on Main Street. Standard rail is being used. The city is repaving from Markham to Ninth Streets and the company will later pave between its tracks.

Savannah Electric & Power Company, Savannah, Ga., during the first nine months of this year completed 23,131 yards of paving between its tracks and 2 ft. outside on West Broad, Bay, Habersham, Abercorn and Gurnett Streets on account of the paving or repaving of those thoroughfares.

New York, N. Y.—Work has started on the contracts to alter the Bridge Plaza rapid transit station, Long Island City, to permit dual operation of the Astoria and Corona extensions in Queens Borough by the Brooklyn (N. Y.) Rapid Transit trains as well as the Interborough trains. The Board

of Estimate approved the necessary appropriation of \$107,000 at its meeting on Nov. 10. The contracts have been executed by the Transit Commission—one with the New York Municipal Railway Corporation for the laying of extra tracks to permit the operation of shuttle trains, and the other with the Jobson-Gifford Corporation for the construction of the steel work to support the new tracks.

Trade Notes

Standard Crane & Hoist Company, Philadelphia, Pa., has been taken over by the American Engineering Company.

The Texas Company, New York, N. Y., has been awarded a renewal of its contract for all rolling stock lubricants with the Brooklyn Rapid Transit Company and the New York Consolidated Railroad for the year 1923.

The National Railway Car Cleaning Company, Jersey City, N. J., has been incorporated at Trenton with \$25,000 capital to engage in car cleaning. The papers of incorporation were filed by Butler & Butler.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has leased a six-story building to be erected on a lot 100 ft. x 150 ft. at Jones Avenue and Marietta Street, Atlanta, Ga., at a cost of \$360,000. The building, which is to be known as the Westinghouse Electric Building, will be constructed according to the company's specifications and will be used as an office, warehouse and service station. Construction work was started Dec. 1 and will probably be completed by next May.

New Advertising Literature

Irving Iron Works Company, Long Island City, N. Y., has issued Catalog 3A82 which describes the generous lighting afforded in dark places where Irving Subway is used overhead.

The Linde Air Products Company, New York, N. Y., started in August of this year the publication of a monthly entitled *Oxy-Acetylene Tips*. It was announced that the purpose of the booklet was to convey to members of the organization "information which may be used to promote a larger application of the process by existing users, and encourage its employment by present non-users."

Ingersoll-Rand Company, New York, N. Y., and A. S. Cameron Steam Pump Works announce the opening of a branch office at 718 Ellicott Square Building, Buffalo, N. Y. This new office is equipped to render full service to those interested in air, gas and ammonia compressors, vacuum pumps, turbo blowers and compressors, condensers, oil and gas engines, pneumatic tools, rock drills, centrifugal and direct-acting pumps and other of the numerous products manufactured by these companies.

About Roman Chariots

Some one remarked that Roman chariots carried hand brakes. Perhaps they did! We don't know because we weren't making hand brakes in those days,



but—

We are proud to say that **PEACOCK BRAKES**

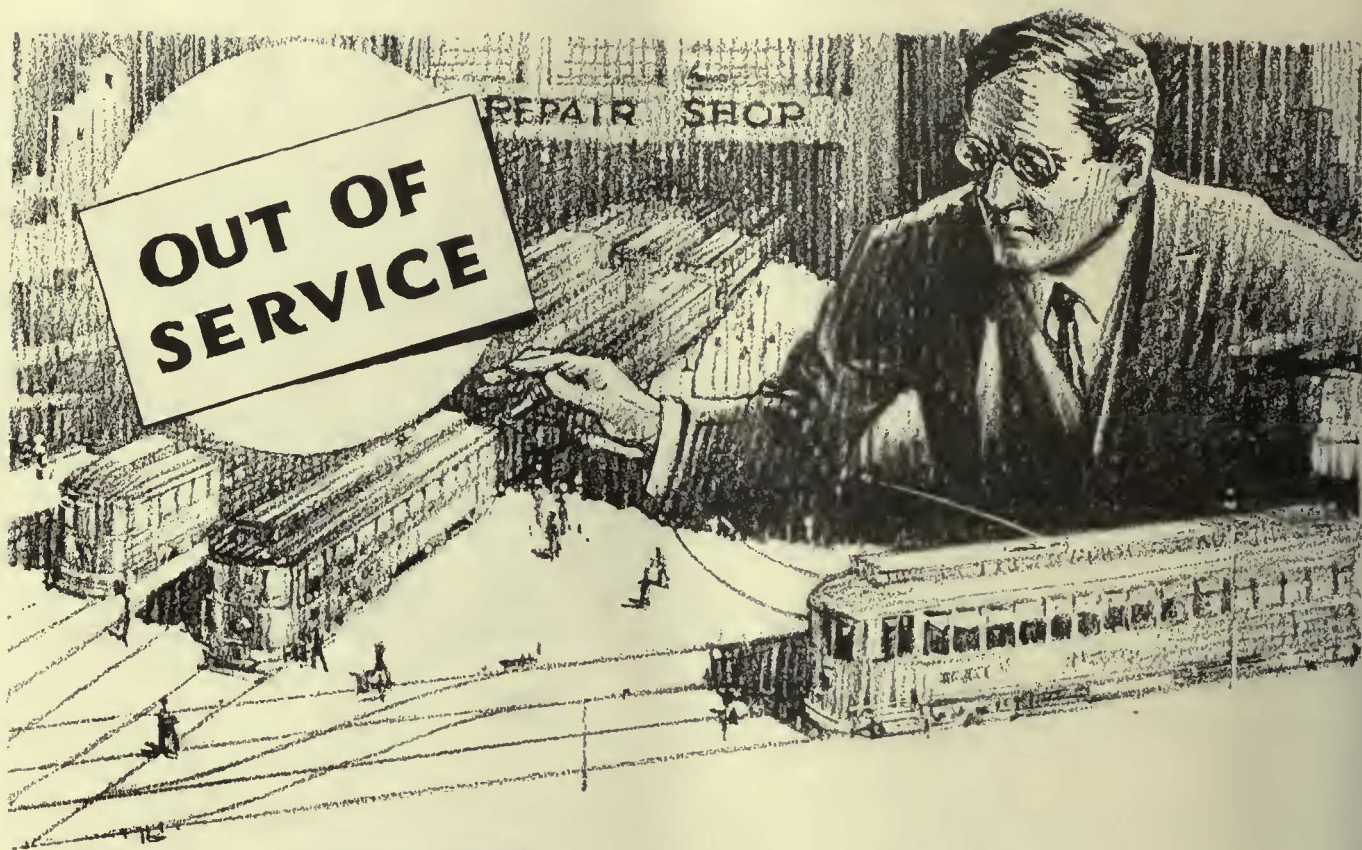
are now used on many of the finest, fastest and most modernly equipped electric railway cars in this country and abroad. Such, for instance, as the great subway cars of the New York Municipal Railways.

Although we hadn't started manufacturing hand brakes when chariot-racing was the sport of the Caesars, still we have been making them for about twenty years, with a constantly growing reputation for success and popularity in this particular field.

When you need information on hand brakes, don't spend your time reading the history of ancient Rome—write us instead.

National Brake Co., Inc.
890 Ellicott Square, Buffalo, N. Y.





An Offer

to share the responsibilities of 491 busy men

THERE are 491 electric railway companies within easy reach of our branch offices. (See list at bottom of opposite page.)

Each one of these companies puts a great deal of necessary responsibility upon its Equipment Superintendent.

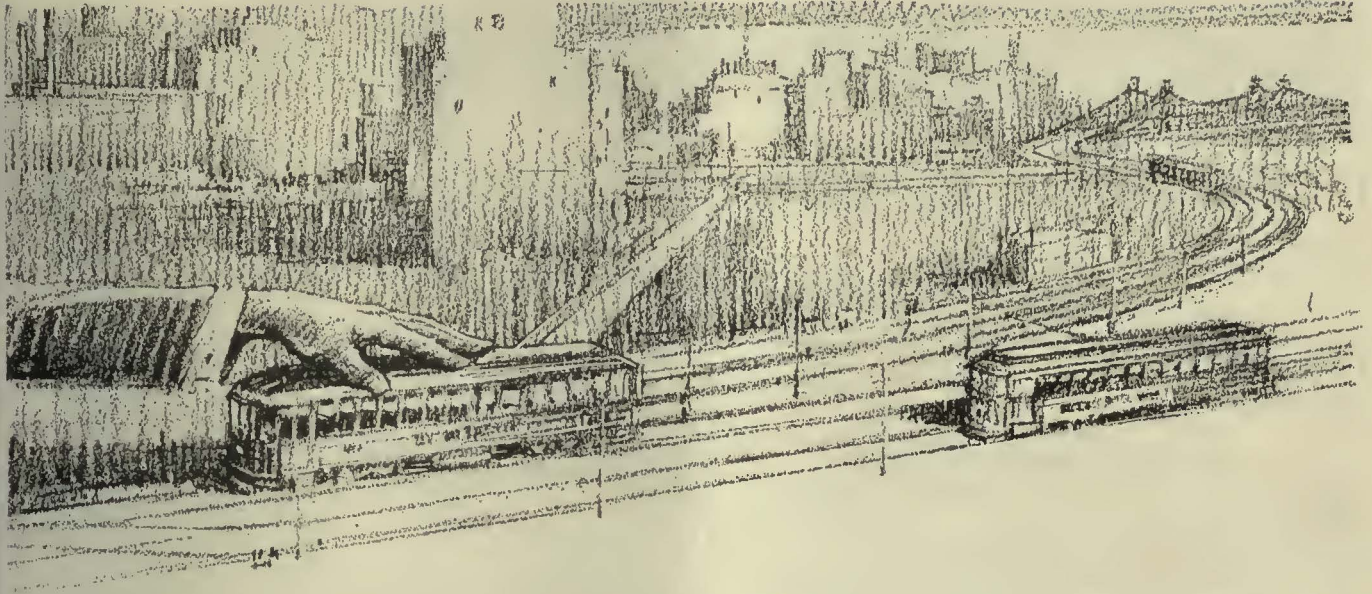
He is the man whose business it is to—

1. Keep the cars in service.
2. Lower the maintenance cost of the cars.

The Vacuum Oil Company, through its Engineering Service, gladly offers to share the Equipment Superintendent's responsibility for keeping "Out of Service" signs off his company's cars and for lowering maintenance costs per thousand car miles.

This offer is based on the economies effected by the Vacuum Oil Company for street railways not only in

VACUUM OIL COMPANY



this country but throughout the world.

In dealing with the Vacuum Oil Company, you deal with a world-wide authority in the field of lubrication. This authority is the result of 56 years' specialized experience in the manufacture and application of high-grade lubricating oils.

Any Equipment Superintendent who would like to lower his maintenance costs per thousand car miles is cordially invited to get in touch with our nearest branch office.

A preliminary getting together of this sort involves no obligation on your part.



Lubricating Oils

A grade for each type of service

Domestic Branches:

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Boston
Indianapolis

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Minneapolis

Philadelphia
Buffalo

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VACUUM OIL COMPANY

Bankers and Engineers

Ford, Bacon & Davis

Incorporated
Business Established 1894
115 BROADWAY, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

THE J. G. WHITE ENGINEERING CORPORATION

Engineers—Constructors
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EXAMINATIONS REPORTS APPRAISALS
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DAY & ZIMMERMANN, INC. ENGINEERS

*Design, Construction
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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.

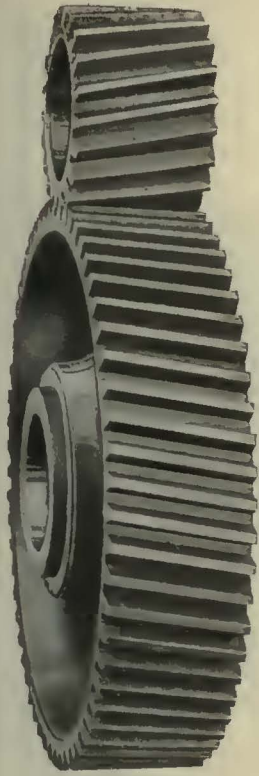
Are They as Good as Nuttall's?

Any manufactured product is only good, bad, better or best when definitely compared to some accepted standard. In buying gears or trolleys have you certain standards of material, workmanship, mileage, service, life, etc., that they must meet?

You wouldn't dream of buying an unguaranteed tire even for a flivver, so why would you buy any gears or trolleys not guaranteed and proven as Nuttall's are? Nuttall products are manufactured to *standards*—engineering, chemical, physical, production, and service.

The next time a Nuttall representative visits you let him tell you how many standards of excellence Nuttall products must meet before *we* are satisfied.

Every Gear Registered



1st Number 1
74 years' service
45,423 Miles



R.D. NUTTALL COMPANY
PITTSBURGH, PENNSYLVANIA

All Westinghouse Electric & Mfg Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

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with Drawn Separable Thimbles
Your best insurance against insulator breakage
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Incorporated
Design and Construction of
Electric Railways, Shops, Power Stations
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Ramapo Iron Works Ajax Forge Company
Established 1881 Established 1883
RAMAPO AJAX CORPORATION
Successor
HILLBURN, NEW YORK
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Automatic Return Switch Stands for Passing Sidings
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SERVICE EFFICIENCY ECONOMY
TIME-TABLE SERVICE
TRAFFIC EXPERTS
CITY AND INTERURBAN RAILWAYS
The Jas. H. Crosett Co. 348 Carl St.
ENGINEERS San Francisco, Calif.

Transmission Line and Special Crossing
Structures, Catenary Bridges
WRITE FOR OUR NEW DESCRIPTIVE CATALOG
ARCHBOLD-BRADY CO.
Engineers and Contractors SYRACUSE, N. Y.

JOE R. ONG
Consulting Transportation Engineer
Specializing in Traffic Problems and in Methods to
Improve Service and Increase
Efficiency of Operation
PIQUA, OHIO

THE P. EDWARD WISH SERVICE
50 Church St. Street Railway Inspection 131 State St.
NEW YORK DETECTIVES BOSTON
When writing the advertiser for information or prices, a mention of the Electrical Railway Journal would be appreciated.

- AI BRAKE HANDLES: Bronze.....
- AIR BRAKE HANDLES: Malleable Iron.....
- CAR TRIMMINGS:
 - Conductor Signal Bells.....
 - Door Sheaves and Track.....
 - Motor and Seats.....
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 - Platform Foot Gongs.....
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- CONTROLLER HANDLES:
 - Bronze, operating.....
 - Bronze, reversing.....
 - Malleable Iron, operating.....
 - Malleable Iron, operating, adj. type.....
 - Malleable Iron, operating, with bronze or steel bushings.....
 - Malleable Iron, reversing.....
 - Malleable Iron, reversing, adj. type.....
 - Malleable Iron, reversing, with bronze or steel bushings.....
- CONTROLLER PARTS:
 - Contact Fingers, operating.....
 - Contact Fingers, reversing.....
 - Contact Segment Tips.....
 - Contact Segments.....
 - Contact Washers.....
 - Controller Finger Tips.....
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- DESTINATION SIGNS, STEEL.
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 - Bolts, Special for Motors and Trucks.....
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 - Gear Cases: Malleable Iron.....
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- THIRD RAIL SHOE BEAM: Repair Parts.....
- THIRD RAIL SHOE BEAMS.
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 - Trolley Wheels to Specifications.....
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 - Brake Pins.....
 - Brake Riggings for All Types of Brakes.....
 - Brakes, for Maximum Traction Trucks, Columbia Patented.....
 - Coupling Pins.....
 - Equalizers.....
 - Gusset Plates.....
 - Journal Box Covers.....
 - Journal Box Shims.....
 - Journal Boxes.....
 - Journal Brass Wedges.....
 - Journal Brasses.....
 - Journal Check Plates.....
 - Turnbuckles.....



“Columbia Service”

*It means this list—
and more!*

For your convenience we append this list of the more common products of Columbia Shops, products for which repeat orders are constantly being received from scores of satisfied railway customers.

As an actual fact “Columbia Service” embraces a much wider scope. We are being called upon constantly to produce special parts to our customers’ own drawings and specifications. Many companies have learned the lesson that such work can be done better and more economically in Columbia’s shops. Why? Because we have equipment suited to the work, and men accustomed to developing new ideas.

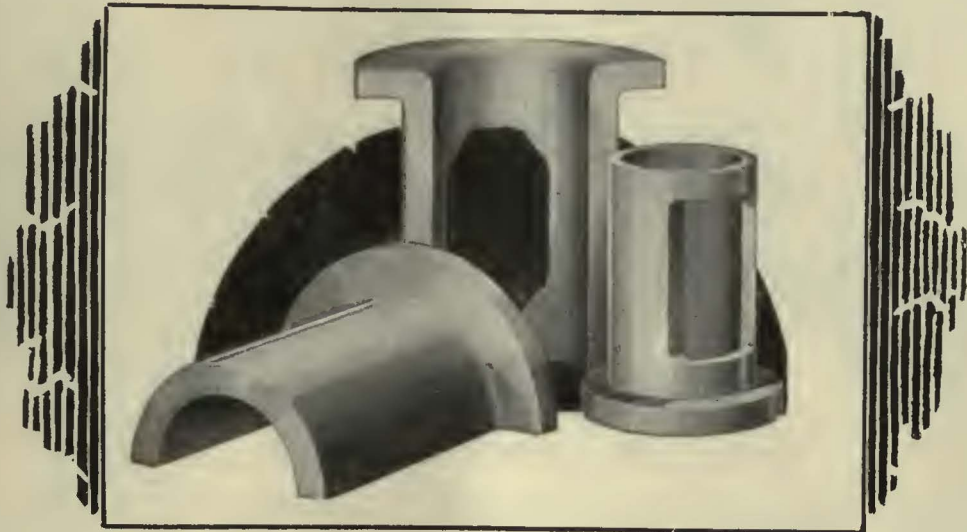
Talk it over with our representative

**The Columbia Machine Works
and Malleable Iron Company**
Atlantic Ave. and Chestnut St., Brooklyn, N. Y.

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- E. Keller, Brooklyn, N. Y.
- F. C. Hedley, Brooklyn, N. Y.
- J. L. Whittaker, 141 Milk St., Boston, Mass.
- E. Allison Thornwell, 1513 Candler Bldg., Atlanta, Ga.
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"TIGER" BRONZE

AXLE AND ARMATURE BEARINGS



Tiger Bronze Axle and Armature bearings are good bearings. — They prove it every day on the most progressive American railways. It will pay you to investigate.

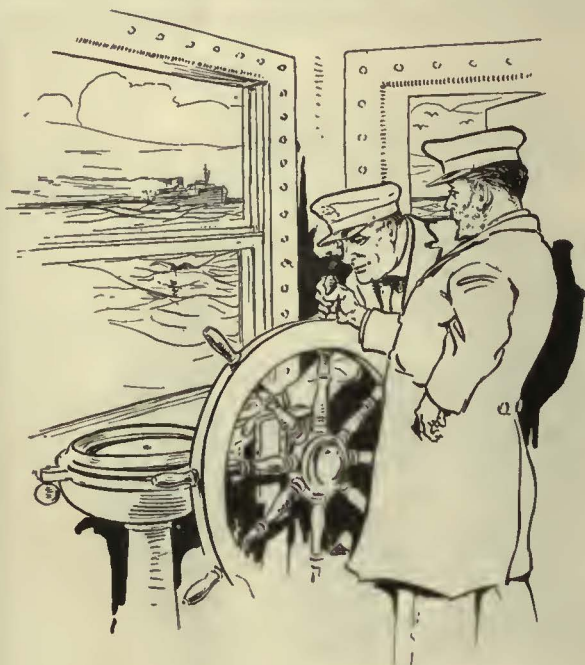
MORE-JONES BRASS & METAL CO.
St. Louis, Missouri

TROLLEY WHEELS:
V-K Oilless, M-J Lubricated
HARPS: V-K Non-Arcing

BEARINGS: "Tiger" Bronze
Axle and Armature

ARMATURE BABBITT
and Similar Products

MORE-JONES QUALITY PRODUCTS



Where Are We Headed?

Industry relies less on guesses than it did in the days when it was easy to roll up a surplus.



The electric railway industry in particular has learned the lesson of watching its step.



Electric railway men as a whole will do their 1923 buying on the basis of the industry's fundamental statistics.



They will want to know just where the industry is headed before they plunge with their newly developed net profits.



Their guide will be the annual compilation of facts for which they rely on the Statistical issue of the *Electric Railway Journal*.

Its text pages are their well known data book.



Its advertising pages are their well used buying guide.



What have you to say to these men at that time?



January 6, 1923

Added circulation. Added attention. Added value.

Enter your space reservation early. Help in writing a resultful piece of copy is part of our service.

Forms close December 30.

Electric Railway Journal

(A McGraw-Hill Publication)

Tenth Avenue at 36th Street
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Member A.B.P. Member A.B.C. Member A.E.R.A.

HALE & KILBURN SEATS

are the **BEST** for
One Man Safety Cars

*Our Patented Space-Saving Feature
gives 1½ inches more space for each Passenger*



*Lightest Weight
Stationary
Steel Seat*

**Lightest
Strongest
Simplest
Neatest**



*Lightest
Weight
Walkover
Steel Seat*

*Yet no higher in price than others
Specify H & K Seats for Your New Cars*

Hale & Kilburn Corporation
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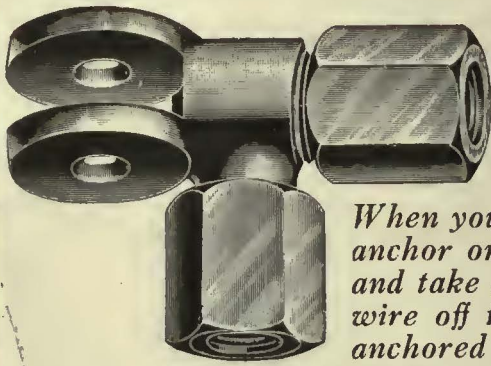
CARNEGIE Wrought Steel Wheels

You demand high mileage at low cost per mile. This demand is met in the special process by which Carnegie Wrought Steel Wheels are manufactured.

The wheel for Real Service.

Carnegie Steel Company

GENERAL OFFICES: CARNEGIE BUILDING, PITTSBURGH, PA.

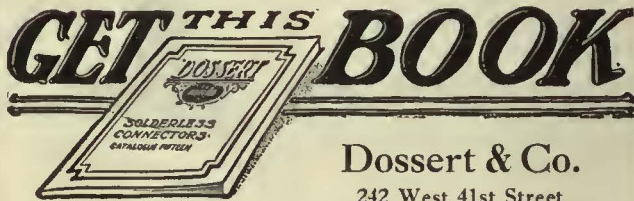


When you want to anchor one cable and take a branch wire off the anchored cable

DOSSERT CABLE ANCHOR

Consists of an elbow and clevis for the strain insulator—so arranged that pull is exerted on one cable only.

There are several types of Dossert Cable Anchors shown in the 15th Year Book, which catalogs the whole line.



FREE

Dossert & Co.
242 West 41st Street
New York, N. Y.

Bates Steel Poles

Used for a combination of street railway and elevated overhead

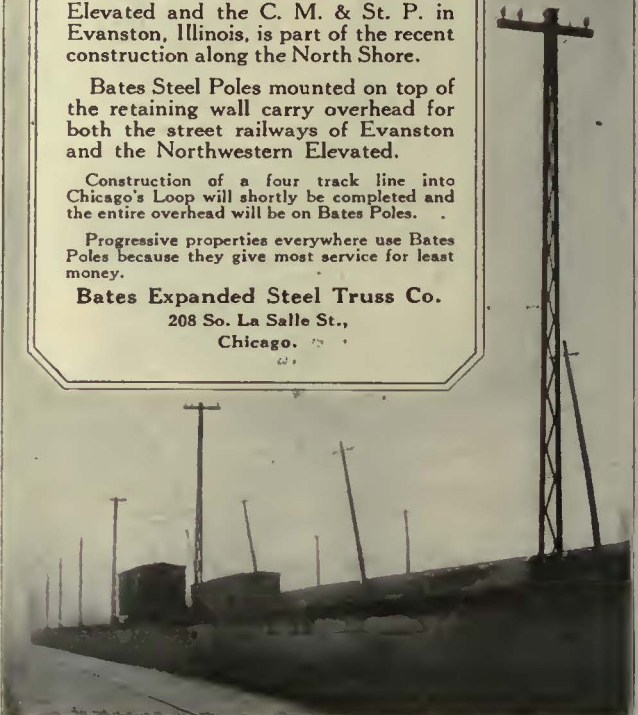
This team track of the Northwestern Elevated and the C. M. & St. P. in Evanston, Illinois, is part of the recent construction along the North Shore.

Bates Steel Poles mounted on top of the retaining wall carry overhead for both the street railways of Evanston and the Northwestern Elevated.

Construction of a four track line into Chicago's Loop will shortly be completed and the entire overhead will be on Bates Poles.

Progressive properties everywhere use Bates Poles because they give most service for least money.

Bates Expanded Steel Truss Co.
208 So. La Salle St.,
Chicago.



ELRECO TUBULAR POLES

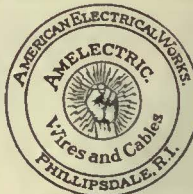


COMBINE

Lowest Cost Lightest Weight
Least Maintenance Greatest Adaptability

Catalog complete with engineering data sent on request

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO
New York City, 30 Church Street



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TROLLEY WIRE

WEATHERPROOF WIRE AND CABLE

PAPER INSULATED UNDERGROUND CABLE

MAGNETIC WIRE

Reg. U. S. Pat. Office
Galvanized Iron and Steel
Wire and Strand

Incandescent Lamp Cord

AMERICAN ELECTRICAL WORKS
PHILLIPSDALE, R. I.

Boston, 176 Federal; Chicago, 112 W. Adams;
Cincinnati, Traction Bldg.; New York, 233 B'way

FLOOD CITY

Rail Bonds and Trolley Line Specialties

Flood City Mfg. Co., Johnstown, Pa.



U. S. Electric Contact Signals

for
Single-track block-signal protection
Double-track spacing and clearance signals
Protection at intersections with wyes
Proceed signals in street reconstruction work

United States Electric Signal Co.
West Newton, Mass.



INSULATED WIRES AND CABLES
JOHN A. ROEBLING'S SONS CO., TRENTON, NEW JERSEY

AETNA INSULATION LINE MATERIAL

Third Rail Insulators, Trolley Bases, Harps and Wheels, Bronze and Malleable Iron Frogs, Crossings, Section Insulators, Section Switches



Albert & J. M. Anderson Mfg. Co.
239-93 A Street Boston, Mass.
Established 1877

Branches—New York, 135 B'way
Philadelphia, 429 Real Estate Trust Bldg. Chicago, 105 So. Dearborn St.
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SPECIAL TRACKWORK

Of the well-known WHARTON Superior Designs
and Constructions

Steel Castings
Converter and
Electric

Forgings
Drop Hammer
and Press

Gas Cylinders
Seamless
Steel

Wm. Wharton Jr. & Co. Inc., Easton, Pa.
(Subsidiary of Taylor-Wharton Iron & Steel Co.,
High Bridge, N. J.)

ORIGINATORS OF
MANGANESE STEEL TRACKWORK

International Creosoting & Construction Co. Galveston, Texas

Plant—Texarkana Beaumont Galveston

MONEY SAVERS TO RAILWAYS

Treated railway ties, poles, piling,
bridge timbers, etc.

See our full page advertisement
in last week's issue.

High-Grade Track Work

SWITCHES—MATES—FROGS—CROSSINGS
COMPLETE LAYOUTS
IMPROVED ANTI-KICK BIG-HEEL SWITCHES
HARD CENTER AND MANGANESE
CONSTRUCTION

New York Switch & Crossing Co.
Hoboken, N. J.

American Rail Bonds

CROWN
UNITED STATES
TWIN TERMINAL
SOLDER
TRIPLEX

Arc Weld and Flame Weld

Send for new
Rail Bond Book

American Steel & Wire
CHICAGO
NEW YORK
Company

BARBOUR-STOCKWELL CO.

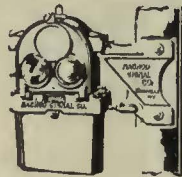
205 Broadway, Cambridgeport, Mass.
Established 1858

Manufacturers of
Special Work for Street Railways
Frogs, Crossings, Switches and Mates
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Kerwin Portable Crossovers
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ESTIMATES PROMPTLY FURNISHED

AUTOMATIC SIGNALS

Highway Crossing Bells
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NACHOD SIGNAL COMPANY, INC.
LOUISVILLE, KY.



Standard Underground Cable Co.

Manufacturers of
Electric Wires and Cables of all kinds;
also Cable Terminals, Junction Boxes, etc.
Boston Philadelphia Pittsburgh Detroit New York
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Chapman Automatic Signals

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NASHVILLE TIE COMPANY

Cross Ties: White Oak, Chestnut, and Treated Ties.
Oak Switch Ties.

Prompt shipment from our own stocks.

Headquarters—Nashville, Tenn.

A. D. Andrews, Terre Haute, Ind., Representative.

THE INDIANAPOLIS SWITCH & FROG Co., SPRINGFIELD, OHIO
Indianapolis Economy Products That Make Dollars "Grow"

Indianapolis Solid Manganese:

Frogs, Crossings, Mates and Tongue-switches. Super-quality material. Par-excellent design. Gives many lives to one, of ordinary construction and when worn down, CAN BE RE-STORED by INDIANAPOLIS WELDING.

Indianapolis Electric Welder:

Efficient, Rapid, ECONOMICAL, Durable. Price, \$2.00 (per day for three hundred days) thoroughly dependable every day in the year, upkeep about 75 cents per month. LAST A LIFE TIME.

Indianapolis Welding Steel:

Fluxated heat treated Metal Electrodes, insure Uniform Dependable Welds that are from 75 per cent to 100 per cent more efficient, than the "MELT," from the same High Grade basic stock, untreated.

Indianapolis Welding Plates:

Eliminate "Joints" and "Bonds" in Street Track. Higher in Strength and Conductivity than the unbroken Rail. Installed according to instructions, have proven THOROUGHLY DEPENDABLE, during 10 YEARS of "Time and Usage" TEST. Extensively used in 48 STATES and COUNTIES. Recognized as paramount MAINTENANCE ELIMINATORS.

Indianapolis Welding Supplies:

CABLES, HELMETS, LENSES, CARBONS.

Turnibles:

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Indianapolis "Economy" Products:

are Pre-eminently "Money Savers," YES—"Money Makers" for Electric Railways.

THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

Builders since 1868 of
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 of continuing reliability

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 CHICAGO, Marquette Building
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Bayonne, N. J.
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Makers of Steam Superheaters
 since 1898 and of Chain Grate
 Stokers since 1893

BRANCH OFFICES

DETROIT, Ford Building
 NEW ORLEANS, 521-5 Baronne Street
 HOUSTON, TEXAS, Southern Pacific Building
 DENVER, 435 Seventeenth Street
 SALT LAKE CITY, 705-6 Kearns Building
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RAILWAY MOTOR BRUSHES



Grade 812 has been proved by test the most economical and satisfactory brush obtainable for standard flush or slotted commutator railway motors on local or moderate speed interurban service. One of a series of standard railway motor brushes.

COLUMBIA BRUSHES

COST NO MORE — LAST LONGER

NATIONAL CARBON COMPANY, INC.

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THE WORLD'S STANDARD

"IRVINGTON"

Black and Yellow
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FOSTER SUPERHEATERS

A necessity for turbine protection, engine cylinder economy and utilization of superheat for all its benefits

POWER SPECIALTY COMPANY, 111 BROADWAY, NEW YORK

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ALLIS-CHALMERS
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Electrical Machinery, Steam Turbines, Steam Engines,
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RWB DYNAMOTORS

FOR
 CARBON ARC RAIL JOINT WELDING
 CARBON ARC RAIL BONDING
 CARBON and METALLIC ARC GENERAL WELDING
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Don't Advertise Unless—

you are absolutely on the level
with your customers—

Unless your goods are so excel-
lent that everyone who buys them
once will want them again—

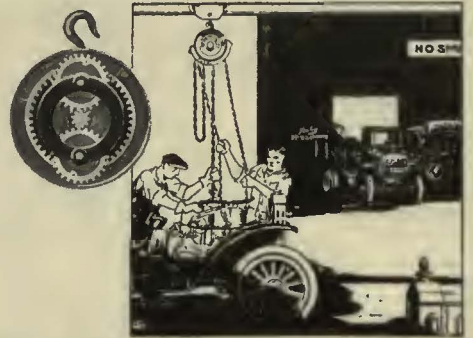
Unless there is real need for
what you make—

Unless you appreciate that it
takes time and costs money to
educate an industry to associate
your trade mark with a definite
standard of quality—

Unless your business is built on
the firm foundation of economical
production and sound finance.

Published by the Electric Railway Journal in co-operation
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FORD TRIBLOC



For Accurate Placing

THE Tribloc lowers its load gently and
accurately into place. To understand
why, one has only to examine the planetary
gear system. Such a well balanced drive in-
sures absolute smoothness of operation.
A Tribloc will never jump, jam, or jerk
under its proper load.

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51 CHAMBERS ST. NEW YORK, U. S. A.

PARIS BRUSSELS TURIN BARCELONA RIO DE JANEIRO

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ENGINEERS

QUIGLEY FUEL SYSTEMS INC

POWDERED COAL
EQUIPMENT and APPLIANCES

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CONTRACTORS

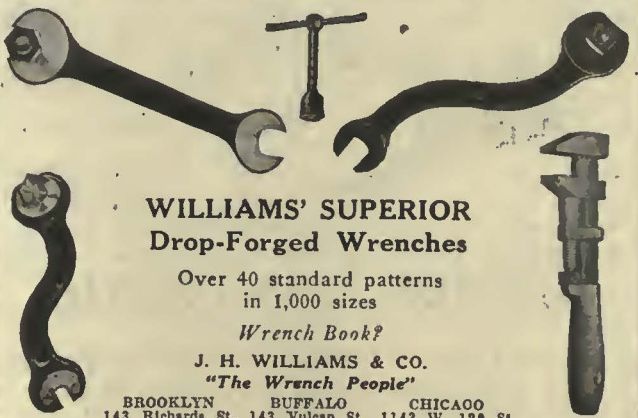
26 CORTLANDT STREET NEW YORK, N. Y.



We make a specialty of
**ELECTRIC RAILWAY
LUBRICATION**

We solicit a test of TULC
on your equipment.

The Universal Lubricating Co.
Cleveland, Ohio



**WILLIAMS' SUPERIOR
Drop-Forged Wrenches**

Over 40 standard patterns
in 1,000 sizes

Wrench Book?

J. H. WILLIAMS & CO.
"The Wrench People"

BROOKLYN BUFFALO CHICAGO
143 Richards St. 143 Vulcan St. 1143 W. 126 St.

SEARCHLIGHT SECTION

EMPLOYMENT-BUSINESS OPPORTUNITIES-EQUIPMENT

UNDISPLAYED—RATE PER WORD:
 Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.
 Positions Vacant and all other classifications, 8 cents a word, minimum charge \$2.00.
 Proposals, 4C cents a line an insertion.

INFORMATION:
 Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.
 Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:
 1 to 3 inches.....\$4.50 an inch
 4 to 7 inches..... 4.30 an inch
 8 to 14 inches..... 4.10 an inch
 An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.

E. R. J.

POSITIONS VACANT

DRAFTSMAN wanted; familiar with steam and street railway special track work. State salary, experience, etc. P-495, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

ENGINEER wanted, familiar with street railway special track work, to work into sales organization. Give full details in first letter. P-494, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

ENGINEER with broad experience in electric railway field for important editorial position on Electric Railway Journal; must be under thirty-five, energetic, good personality and must have a constructive view of the industry. If you are one who enjoys lots of hard work as well as wide association in a fine way with electric railway men and can write, address Managing Editor, Elec. Ry. Journal, 10th Ave. at 36th St., New York City.

GRADUATE electrical engineer wanted by large street railway in eastern Pennsylvania for manager's office; should be about thirty years of age, experienced thoroughly in street railway motors feeder lines and substations; preferably a man with shop experience. P-490, Elec. Ry. Journal, 10th Ave. at 36th St., New York City.

SUPERINTENDENT of transportation wanted for electric line operating interurban, city and suburban property in Middle West. State age, experience, qualification, references and salary expected. Replies treated strictly confidential. P-487, Electric Railway Journal, 10th Ave. at 36th St., New York City.

YOUNG engineer, with a year or two experience in the electric railway field, for an editorial position in New York on Electric Railway Journal. Journal editorial work offers a splendid opportunity

POSITIONS VACANT

for a man to grow rapidly. Must be energetic and have initiative; good opportunity for advancement. Address Managing Editor, Elec. Ry. Journal, 10th Ave. at 36th St., New York City.

POSITIONS WANTED

AUDITOR, broad experience as chief accounting officer with representative utility interests, now engaged on important work for federal government, desires connection with progressive utility as auditor, secretary or treasurer. PW-488, Electric Railway Journal, Real Estate Trust Bldg., Philadelphia, Pa.

CIVIL engineer, technical; married; member American Society Civil Engineers; six years' miscellaneous engineering experience, twelve with street and interurban railways; present, engineer maintenance of way and structures, large property; engineer of recognized ability; excellent references; interview solicited. PW-489, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

SUPERINTENDENT motive power and equipment, with good record based on broad experience, city and interurban, A.C. and D.C., desires position. PW-491, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

FOR SALE

20—Peter Witt Cars

Weight Complete, 33,000 lbs.

Seat 53, 4—G. E. No. 258-C Motors. K-12-H Control, West. Air Taylor Trucks. R.H. Type. Complete.

ELECTRIC EQUIPMENT CO.
 Commonwealth Bldg., Philadelphia, Pa.

FOR SALE

10—New G.E. 203-P 50 hp.

MOTORS

TRANSIT EQUIPMENT COMPANY,
 501 Fifth Avenue, New York

“SEARCHLIGHT”
 IS
Opportunity
Advertising

- to help you get what you want.
- to help you sell what you no longer need.

Take Advantage Of It

For Every Business Want

“Think SEARCHLIGHT First”

The “Searchlight” Advertising in This Paper

is read by men whose success depends upon thorough knowledge of means to an end—whether it be the securing of a good second-hand piece of apparatus at a moderate price, or an expert employee.

THE BEST PROOF

of this is the variety of this journal's Searchlight ads. Without a constant and appreciable demand for such machinery or services, by its readers, the market place which these advertisements represent could not exist for any length of time.

Are you using the Searchlight Section?

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with
Names of Manufacturers and Distributors Advertising in this Issue

- Advertising, Street Car
Collier, Inc., Barron G.
- Air Receivers, Aftercoolers
Ingersoll-Rand Co.
- Anchors, Guy
Electric Service Sup. Co.
Ohio Brass Co.
Standard Steel Works Co.
Westinghouse E. & M. Co.
- Armature Shop Tools
Elec. Service Supplies Co.
- Automatic Return Switch
Stands
Ramapo Ajax Corp.
- Automatic Safety Switch
Stands
Ramapo Ajax Corp.
- Axles
Bemis Car Truck Co.
Axles, Car Wheel
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
Westinghouse E. & M. Co.
- Axle Straighteners
Columbia M. W. & M. I. Co.
- Babbitt Metal
Ajax Metal Co.
More-Jones Br. & Metal Co.
- Babbtling Devices
Columbia M. W. & M. I. Co.
- Badges and Buttons
Electric Service Sup. Co.
Internat'l Register Co., The
- Batteries, Dry
National Carbon Co.
- Bearings and Bearing Metals
Ajax Metal Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
General Electric Co.
Gilbert & Sons, B. F. A.
Le Grand, Inc., Nic
More-Jones Br. & Metal Co.
Westinghouse E. & M. Co.
- Bearings, Center and Roller
Side
Stuckl Co., A.
- Bearings, Roller
Stafford Roller Bearing Car
Truck Corp'n
- Bells and Gongs
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Consolidated Car-Heating Co.
Electric Service Sup. Co.
- Benders, Rail
Railway Track-work Co.
- Bollers
Babcock & Wilcox Co.
- Bonding Apparatus
American Steel & Wire Co.
Electric Service Sup. Co.
Indianapolis Switch & Frog
Co.
Ohio Brass Co.
Rail Welding & Bonding Co.
Railway Track-work Co.
- Bonds, Rail
American Steel & Wire Co.
Electric Service Sup. Co.
General Electric Co.
Indianapolis Switch & Frog
Co.
Ohio Brass Co.
Rail Welding & Bonding Co.
Westinghouse E. & M. Co.
- Book Publishers
McGraw-Hill Book Co., Inc.
- Brackets and Cross Arms
(See also Poles, Ties,
Posts, etc.)
Bates Exp. Steel & Tr. Co.
Electric Ry. Equip. Co.
Electric Service Sup. Co.
Hubbard & Co.
Ohio Brass Co.
- Brake Adjusters
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.
- Brake Shoes
Amer. Br. Shoe & Fdry. Co.
Barbour-Stockwell Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
- Brakes, Brake Systems and
Brake Parts
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
National Brake Co.
Safety Car Devices Co.
Westinghouse Tr. Br. Co.
- Brooms, Track, Steel or Rat-
tan
Amer. Rattan & Reed Mfg.
Co.
- Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
National Carbon Co.
Westinghouse E. & M. Co.
- Brushes, Graphite
National Carbon Co.
- Brushes, Wire Pneumatic
Ingersoll-Rand Co.
- Brush Holders
Anderson Mfg. Co., A. &
J. M.
Columbia M. W. & M. I. Co.
- Buses, Motor
Brill Co., The J. G.
- Bus Seats
Hale & Kilburn Corp.
- Bushings
Nat'l Fibre & Insulation Co.
- Bushings, Case Hardened and
Manganese
Bemis Car Truck Co.
Brill Co., The J. G.
- Cables (See Wires and
Cables)
- Cambric, Tapes, Yellow &
Black Varnished
Irvington Varnish & Ins. Co.
- Carbon Brushes (See Brushes
Carbon)
- Car Lighting Fixtures
Elec. Service Supplies
- Car Panel Safety Switches
Consolidated Car-Heating Co.
Westinghouse E. & M. Co.
- Cars, Dump
Differential Steel Car Co.
- Cars, Passenger, Freight
Express, Etc.
Amer. Car Co.
Brill Co., The J. G.
Kuhlman Car Co., G. C.
National Ry. Appliance Co.
Wason Mfg. Co.
- Cars, Second Hand
Electric Equipment Co.
- Cars, Self-Propelled
General Electric Co.
- Castings, Brass, Composition
of Copper
Ajax Metal Co.
Anderson Mfg. Co., A. &
J. M.
Columbia M. W. & M. I. Co.
More-Jones Br. & Metal Co.
- Castings, Gray Iron and
Steel
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
- Castings, Malleable and
Brass
Amer. Brake Shoe & Fdry.
Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Le Grand, Inc., Nic
- Catchers and Retrievers,
Trolley
Electric Service Sup. Co.
Ohio Brass Co.
Wood Co., Chas. N.
- Catenary Construction
Archbold-Brady Co.
- Circuit Breakers
General Electric Co.
Westinghouse E. & M. Co.
- Clamps and Connectors for
Wires and Cables
Anderson Mfg. Co., A. &
J. M.
Dossert & Co.
Electric Ry. Equip. Co.
Electric Service Sup. Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Cleaners and Scrapers—
Track (See also Snow-
Plows, Sweepers and
Brooms)
Brill Co., The J. G.
Ohio Brass Co.
- Clusters and Sockets
General Electric Co.
- Coal and Ash Handling (See
Conveying and Hoisting
Machinery)
- Coil Banding and Winding
Machines
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.
- Colls, Armature and Field
Columbia M. W. & M. I. Co.
Economy Elec. Devices Co.
General Electric Co.
- Colls, Choke and Kicking
General Electric Co.
Westinghouse E. & M. Co.
- Colo-Counting Machines
Electric Service Sup. Co.
Internat'l Register Co., The
Johnson Fare Box Co.
- Commutator Slotters
Electric Service Sup. Co.
General Electric Co.
Westinghouse E. & M. Co.
- Commutator Trunlog Devices
General Electric Co.
- Commutators or Parts
Cameron Elec'l Mfg. Co.
Columbia M. W. & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.
- Compressors, Air
Allis-Chalmers Mfg. Co.
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Tr. Br. Co.
- Compressors, Air, Portable
Ingersoll-Rand Co.
- Condensers
Allis-Chalmers Mfg. Co.
General Electric Co.
Ingersoll-Rand Co.
Westinghouse E. & M. Co.
- Condensers, Papers
Irvington Varnish & Ins. Co.
- Connectors, Solderless
Dossert & Co.
Westinghouse E. & M. Co.
- Connectors, Trailer Car
Consolidated Car-Heat'g Co.
Electric Service Sup. Co.
Ohio Brass Co.
- Controllers or Parts
Allis-Chalmers Mfg. Co.
Columbia M. W. & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.
- Controller Regulators
Electric Service Sup. Co.
- Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.
- Converters, Rotary
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.
- Conveying and Hoisting Ma-
chinery
Columbia M. W. & M. I. Co.
- Copper Wire
Auscoada Copper Min. Co.
- Cord Adjusters
Nat'l Fibre & Insulation Co.
- Cord, Bell, Trolley Register,
etc.
Brill Co., The J. G.
Electric Service Sup. Co.
Internat'l Register Co., The
Roebbing's Sons Co., J. A.
Samson Cordage Works
- Cord Connectors & Couplers
Electric Service Sup. Co.
Samson Cordage Works
Wood Co., Chas. N.
- Couplers, Car
Brill Co., The J. G.
Ohio Brass Co.
Westinghouse Tr. Br. Co.
- Cranes
Allis-Chalmers Mfg. Co.
Cross Arms (See Brackets)
- Crossings
Ramapo Ajax Corp.
Crossing Foundations
International Steel Tie Co.
- Crossing Frog & Switch
Ramapo Ajax Corp.
Wharton, Jr., & Co., Wm.
- Crossing Manganese
Indianapolis Switch & Frog
Co.
- Ramapo Ajax Corp.
Crossing Signals (See Sig-
nals, Crossing)
- Crossings Track (See Track)
- Crossings, Trolley
Ohio Brass Co.
- Craners, Roek
Allis-Chalmers Mfg. Co.
- Curtains and Curtain
Fixtures
Brill Co., The J. G.
Electric Service Sup. Co.
Morton Mfg. Co.
- Dealers' Machinery
Electric Equipment Co.
- Derailing Devices (See Track
Work)
- Derailing Switches
Ramapo Ajax Corp.
- Destination Signs
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.
- Detective Service
Wish Service, P. Edward
- Doors, Lathe
Williams & Co., J. H.
- Door Operating Devices
Con. Car-Heating Co.
Nat'l Pneumatic Co., Inc.
Safety Car Devices Co.
- Doors and Door Fixtures
Brill Co., The J. G.
General Electric Co.
Hale and Kilburn Corp.
- Doors, Folding Vestibule
Nat'l Pneumatic Co., Inc.
Draft Rigging (See Couplers)
- Drills, Rock
Ingersoll-Rand Co.
- Drills, Track
American Steel & Wire Co.
Electric Service Sup. Co.
Ingersoll-Rand Co.
Ohio Brass Co.
- Dryers, Sand
Electric Service Sup. Co.
- Ears
Ohio Brass Co.
- Electrical Wires and Cables
Amer. Electrical Works
American Steel & Wire Co.
Roebbing's Sons Co., J. A.
- Electric Grinders
Railway Track-Work Co.
- Electrodes, Carbon
Indianapolis Switch & Frog
Co.
Railway Track-Work Co.
- Electrodes, Steel
Indianapolis Switch & Frog
Co.
Railway Track-Work Co.
- tracting and Operating
Allison & Co., J. R.
Archbold-Brady Co.
Arnold Co., The
Roelker, John A.
Crossett Co., Jas. H.
Day & Zimmermann
Feustel, Robert M.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Englehardt W.
Jackson, Walter
Ong, Joe R.
Parsons Klapp, Brinkerhoff
& Douglas
Richey, Albert S.
Robinson & Co., Inc.
Dwight P.
Sanderson & Porter
Smith & Co., C. E.
Stons & Webster
White Engineering Corp.,
The J. G.
Witt, Peter
- Engineers, Consulting, Steam
Engines, Gas, Oil or Con-
Allis-Chalmers Mfg. Co.
Ingersoll-Rand Co.
Westinghouse E. & M. Co.
- Fare Boxes
Cleveland Fare Box Co.
Economy Electric Devices
Co.
Johnson Fare Box Co.
National Ry. Appliance Co.
- Fences, Woven Wire and
Fence Posts
American Steel & Wire Co.
- Fenders and Wheel Guards
Brill Co., The J. G.
Cleveland Fare Box Co.
Consolidated Car Fender Co.
Electric Service Sup. Co.
Le Grand, Inc., Nic
- Fibre and Fibre Tubing
Nat'l Fibre & Insulation Co.
Westinghouse E. & M. Co.
- Field Coils (See Coils)
- Flooring Composition
Amer. Mason Safety Tread
Co.
- Forgings
Carnegie Steel Co.
Columbia M. W. & M. I. Co.
Williams & Co., J. H.
- Frogs & Crossings, Tee Rail
Ramapo Ajax Corp.
- Frogs, Track
(See Track Work)
Wharton, Jr., & Co., Wm.
- Frogs, Trolley
Ohio Brass Co.
- Fuel Systems
Quickly Fuel System, Inc.
Fuses and Fuse Boxes
Columbia M. W. & M. I. Co.
Consolidated Car-Heating Co.
General Electric Co.
Westinghouse E. & M. Co.
- Fuses, Refillable
Columbia M. W. & M. I. Co.
General Electric Co.
- Gases, Oil and Water
Ohio Brass Co.
- Gaskets
Power Specialty Co.
Westinghouse Tr. Br. Co.
- Gas-Electric Cars
General Electric Co.
- Gas Producers
Westinghouse E. & M. Co.
- Gasoline Torches
Economy Electric Devices
Co.
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Page Steel & Wire Co.
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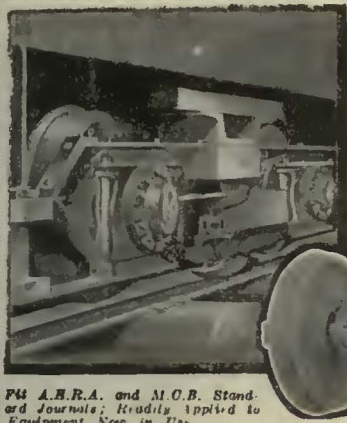
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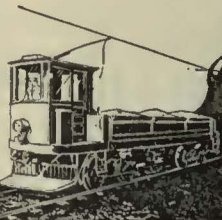
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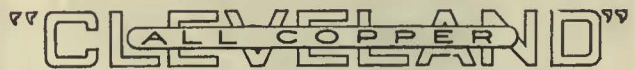
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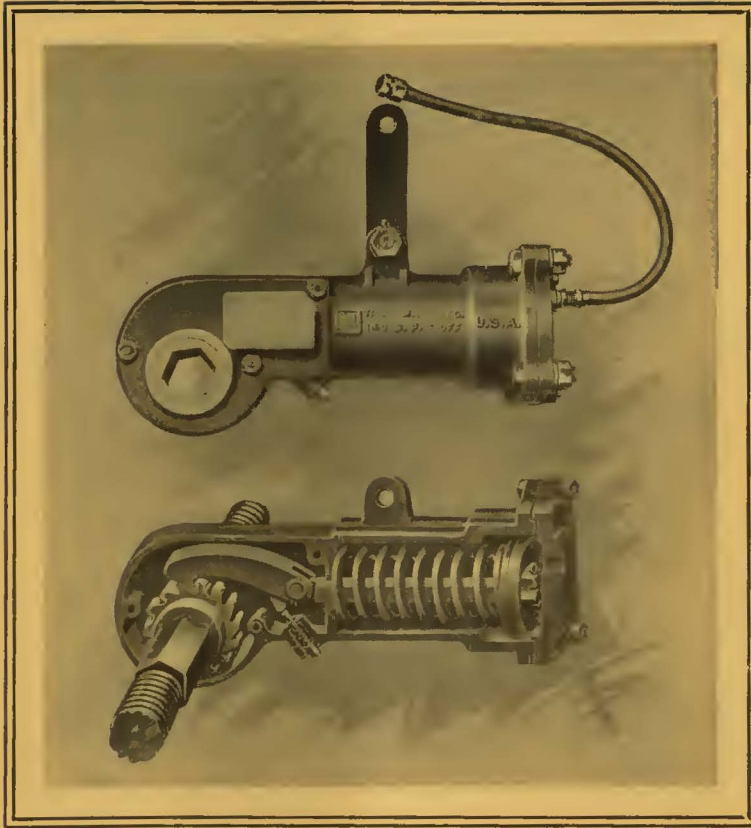
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