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PATENT

# STREET RAILWAY

SOUVENIR **JOURNAL** NUMBER

OCTOBER 1901



1841

TWENTIETH  
ANNUAL  
CONVENTION  
**A.S.R.A.**  
NEW YORK



1881



1901

**STREET RAILWAY PUBLISHING CO.**

NEW YORK 3 PHILADELPHIA 3 CHICAGO 3 LONDON

INDEXED

REPRESS

## ANNOUNCEMENT.

**T**HE publishers desire to call particular attention to the advertising department of this issue. They realize that the regular numbers of the STREET RAILWAY JOURNAL form the standard buyers' directory of the electric railway and tramway industry—a logical result of the publication each month of over 150 pages of advertising, in which are represented practically all of the leading manufacturers, dealers, contractors, etc., in this field. It is interesting to note, however, that the present issue contains more than twice as many pages of advertising as the regular monthly numbers, and forms—without exception—the *most complete cyclopædia ever published* for the purchasers of electric railway equipment and supplies.

Special care has been taken in classification. The division of the advertising pages into eight sections with special title pages—a feature of the STREET RAILWAY JOURNAL'S Convention Numbers since 1896—has been retained. The value of this classification system is increased this year by the cross reference cards, of which certain advertisers have availed themselves. There are, of course, a number of leading manufacturers and dealers who furnish material coming under two or more of the main classifications. With the present arrangement, the purchaser of electric railway apparatus may turn to the advertising department of this issue with the assurance of finding each of the eight classifications remarkably complete in itself—and forming, not a mere “buyers' directory,” but a veritable trade cyclopædia.

Readers of the International Edition will find two new features of considerable practical value—a reference, in each American section, to the European advertisers handling similar apparatus; and an index, in the European section, to the foreign offices and representatives of American manufacturers and dealers.

Another important feature is the New York City Directory. Under this head will be found the names and addresses of the various manufacturers, dealers, contractors and financial institutions represented in this issue, having New York City offices. This will be found of especial convenience both for the Convention delegates and for foreign tramway managers and engineers when visiting New York City.

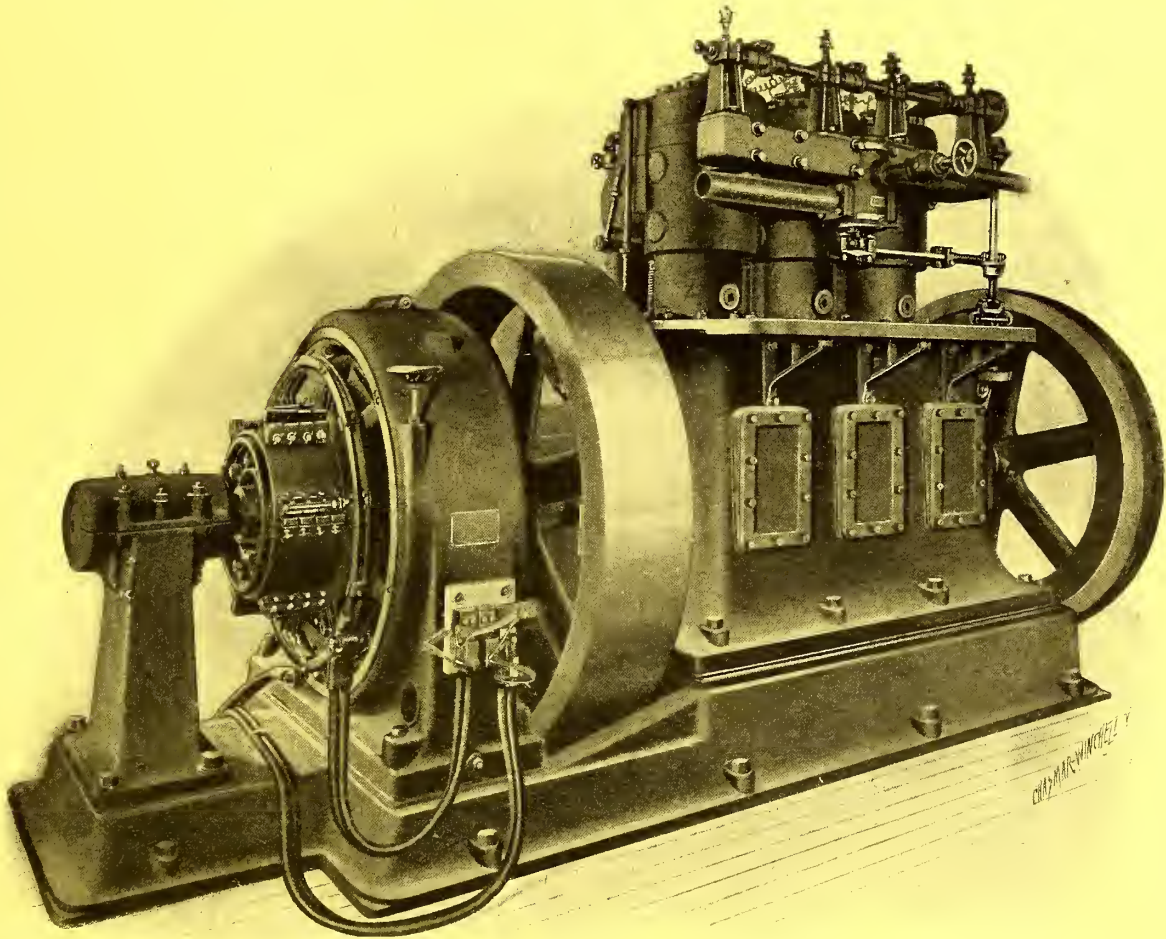
For the reasons above stated, it is believed that the advertising department of this number will possess to an unprecedented degree a *present and permanent reference value* for the electric railway and tramway interests of the world. The subsequent regular issues of the STREET RAILWAY JOURNAL will afford to advertisers the best possible means of furnishing supplementary information regarding the new devices and improved machinery which are constantly being placed on the market, and of reaching possible customers in a most systematic and effective manner.

**THE STREET RAILWAY PUBLISHING COMPANY.**

# Westinghouse, Church, Kerr & Company Engineers

New York, Chicago, Boston, Pittsburg, Philadelphia, Detroit

Westinghouse Gas Engines have a uniformity of Speed and an accuracy of regulation equal to the highest type of Steam Engine.



Three Cylinder Gas Engine Direct Connected to Generator

## The Westinghouse Machine Co.

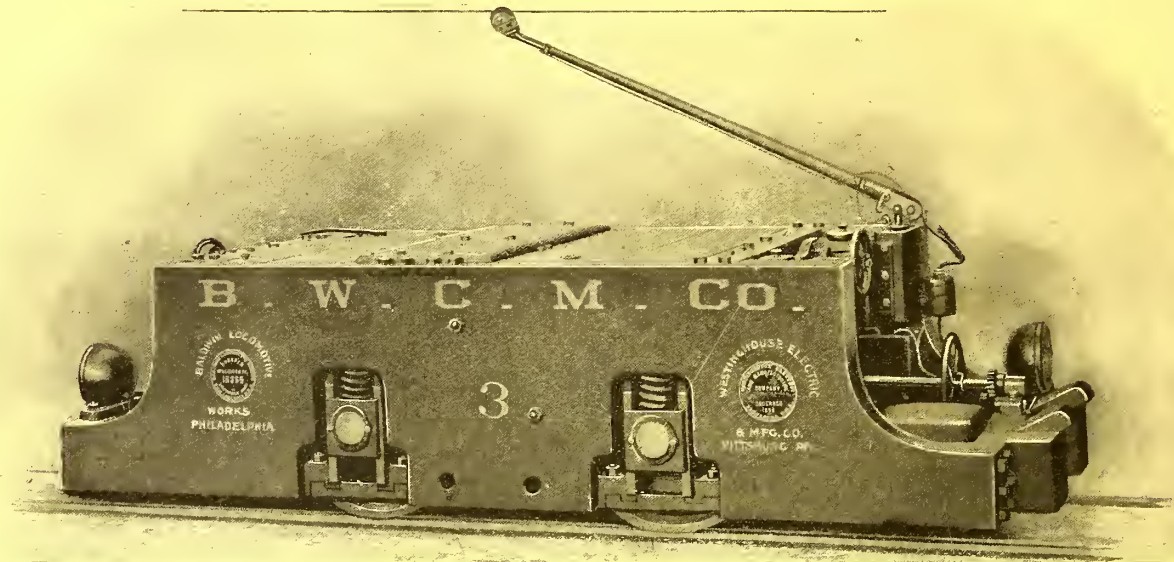
Designers and Builders of

Westinghouse Junior, Standard, Compound and Corliss Steam Engines; Gas Engines, Roney Mechanical Stokers, etc., etc.

Pittsburg—Works—Chicago

Write nearest office of  
Westinghouse, Church, Kerr & Co.

# Baldwin=Westinghouse Electric Locomotives



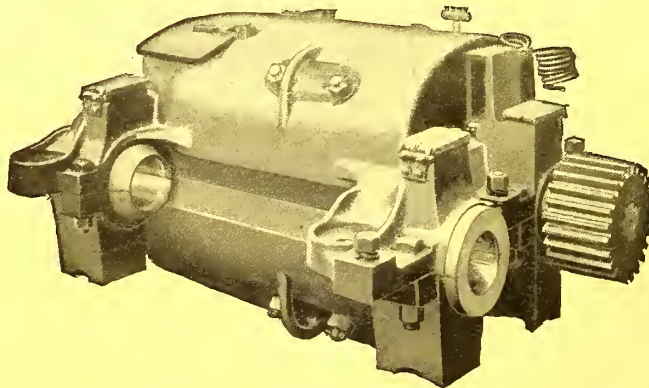
Baldwin-Westinghouse Double End Mining Locomotive, Installed.

**Baldwin Locomotive Works**  
Philadelphia, Pa.

**Westinghouse Electric  
& Mfg. Co.,** Pittsburg, Pa.

## Westinghouse Railway Motors

Are recognized as the most economical under all conditions of service.



Westinghouse No. 56 Railway Motor.

Designed for the Operation of Heavy Cars at High Speeds on Suburban and Interurban Lines.

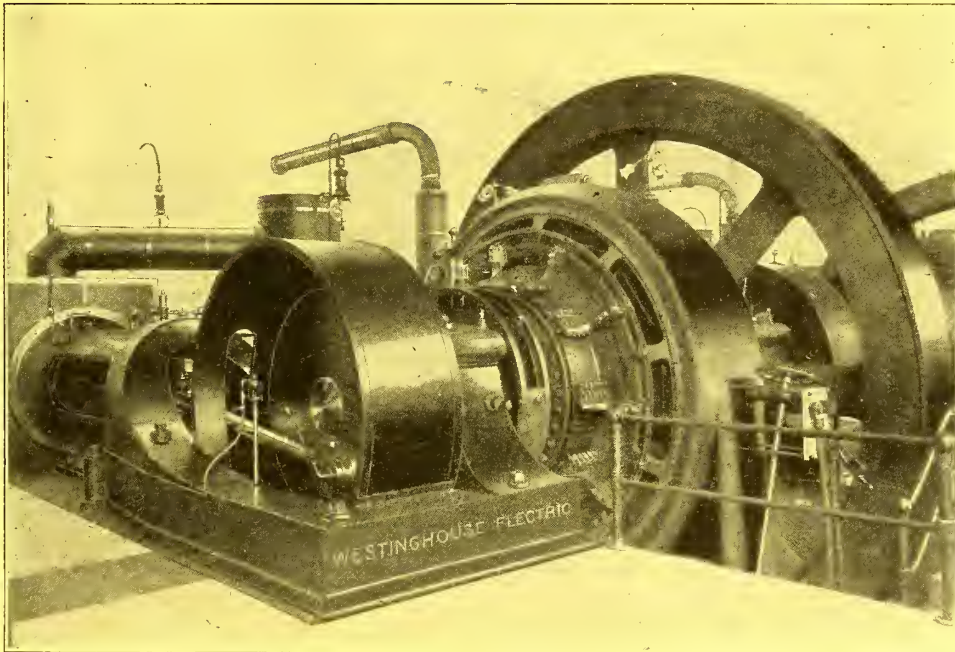
**Westinghouse Electric  
& Mfg. Co.,** Pittsburg, Pa.

All principal cities in U. S. and Canada

# Westinghouse

## GENERATORS

The Standard for Railway,  
Lighting and Power Service



Westinghouse D. C. Engine Type Generators Installed

# Westinghouse Electric

& Manufacturing Co. Pittsburg, Pa.

New York, Buffalo, Philadelphia, Syracuse, Atlanta, Chicago, St. Louis, Seattle, Dallas, Boston, Cincinnati, San Francisco,  
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Mexico. Westinghouse Electric Co., Ltd., Norfolk St., Strand, London, W. C.

# Westinghouse

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Standard Traction Brake Co.

NEW YORK CITY.

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Complete Power Brake Equipments  
for Traction Cars.

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Magnetic Brakes  
and Electric Car Heating Apparatus.

Axle Driven Compressors.

Independent Motor Driven Compressors.

Air Brake Storage System.

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Manufactured by

**The Westinghouse Air Brake Co.**

PITTSBURG, PA.

# STREET RAILWAY JOURNAL

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VOL. XVIII. No. 14.

OCTOBER 5, 1901.

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SINGLE SELF RECORDER—CLOCK FACE.

We make every device known to Register Practice

but we especially Recommend

the



DOUBLE SELF RECORDER—NUMERAL FACE.

# Self-Recording Register

BECAUSE the machine itself keeps the record of fares, relieving the operator of that responsibility, eliminating every chance of mistakes, and giving to the operator and to the railway company an absolutely correct and duplicate record of fares rung up during each trip and at the end of the day's run. This register obviates disputes between the office and conductors. It lessens the work in the office of the railway company.

It acts in the same capacity on a car as a watchman's clock in a building; in other words, it is the only device which enables you to know the inspector is doing his duty.

It has all the features of a portable register and is an absolute contract between the man and his employer. Only one way to beat it and that is not to ring the bell. It economizes in labor in every way and will save its price in two years service.

SAMPLE OF WORK	
TRANSFERS	FARES
7 0 9	2 1 2 4
6 8 6	2 1 1 4
6 5 8	2 1 0 4
6 2 3	2 0 9 0
6 0 3	2 0 8 5

It dispenses with the ordinary trip sheet used by conductors; in fact the conductor has only to turn in his money, name, and number of register. The report is made for him in the operation of the register.

To accomplish the above result we have spent five years' work, and instead of adding any extra work for the conductor have materially lessened it. He has simply to insert his strip and turn the set handle at the beginning and end of his run. The record is made, and the difference between the record at starting and stopping shows the fares rung up.

The working parts of the register are made of the best cold rolled steel, bright and rust proof. Every part is numbered and positively interchangeable.

For the explanation of its action and its method of operation we respectfully invite you to call at our headquarters, Parlor G. Murray Hill Hotel.



DOUBLE CLOCK FACE SEPARATE TOTALIZER, one red hand, one black hand.



St. Louis Register Co.

ST. LOUIS, MO.

GILES S. ALLISON

Sole Sales Agent

57 BROADWAY  
NEW YORK



SINGLE NUMERAL WITH LARGE TOTALIZER.



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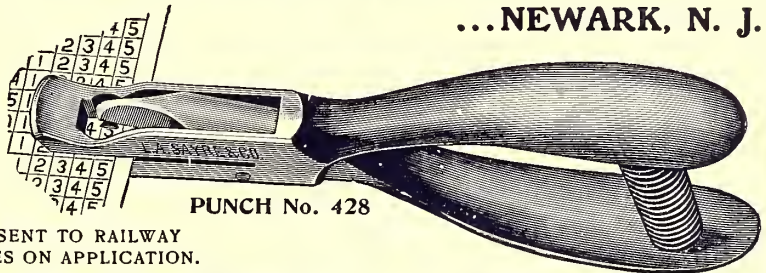
FOR ARC LIGHT AND TROLLEY CORD

Send for Samples. SAMSON CORDAGE WORKS, Boston, Mass.

## L. A. SAYRE & CO.

...NEWARK, N. J.

The Best Punch Ever Made for Transfer Tickets...



PUNCH No. 428

SAMPLES SENT TO RAILWAY COMPANIES ON APPLICATION.



For efficiency, economy and durability use the CORNING BRAKE SHOE.

Trial orders solicited. Satisfaction and saving guaranteed.

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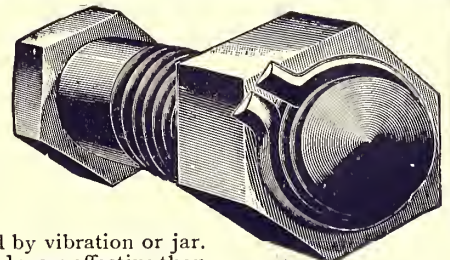
EASTERN SALES OFFICE, 26 Cortlandt St., New York.

CORNING, N. Y.

## SPIRAL NUT-LOCK

What is it?

A graduated circle of crucible steel wire that follows nut on bolt when same is in position, absolutely locking nut.



Some of its advantages

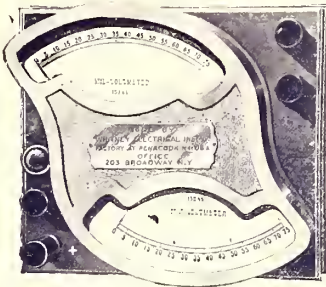
It requires no special tool. Not affected by vibration or jar. Mechanical in construction. Cheaper and more effective than a jam-nut or Cotter key. Specially adapted for equipment, track bolts, etc.

### SPIRAL NUT-LOCK COMPANY

Owners and Manufacturers, 102 CHAMBERS STREET, NEW YORK

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LIST PRICE \$70.00



# A "ONE MAN" BOND TESTER

NO ASSISTANTS ARE REQUIRED TO ENABLE A SINGLE MAN TO RAPIDLY AND ACCURATELY MEASURE BOND RESISTANCE WITH THIS DEVICE. IT IS SHOWN IN ACTUAL OPERATION IN THE CUT BELOW.

WE CAN SUPPLY ACCESSORIES FOR USE WITH IT THAT CONVERT IT INTO A COMBINED

### VOLT AND AMMETER

WHEN SO EQUIPPED THE INSTRUMENT CAN BE USED FOR LOCATING GROUNDS AND SHORT CIRCUITS IN MOTOR ARMATURES AND FIELDS AND FOR CHECKING UP STATION METERS.

IT IS NOT COMPLICATED OR EASILY GOTTEN OUT OF ADJUSTMENT.

PRICES, DISCOUNTS AND FOLDER GIVING FULL DESCRIPTION MAILED ON REQUEST.

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203 BROADWAY  
NEW YORK, N. Y.

General Agents for Whitney  
Electrical Instrument Co.

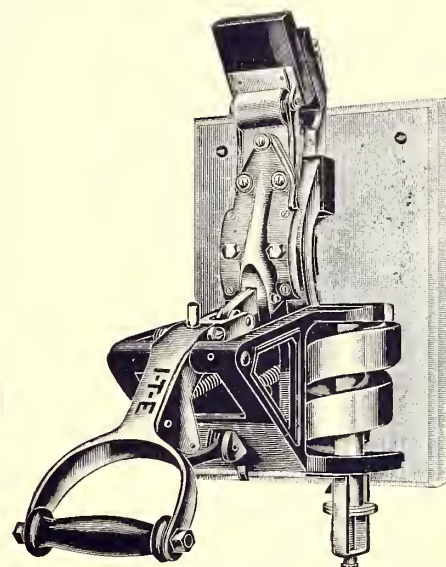


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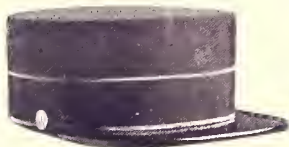
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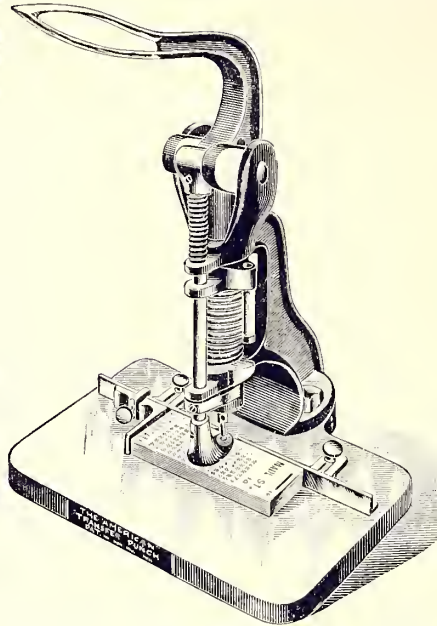
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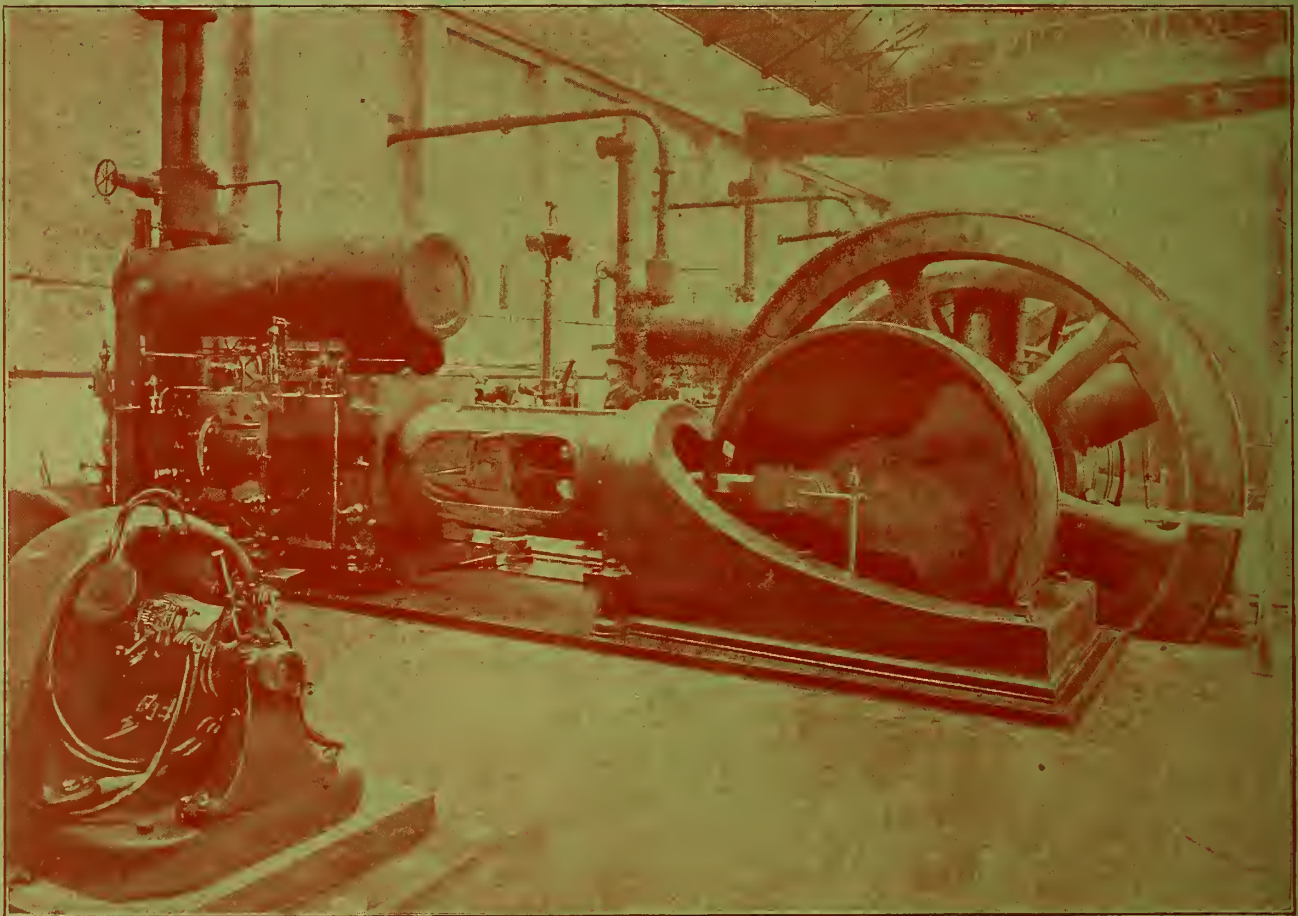
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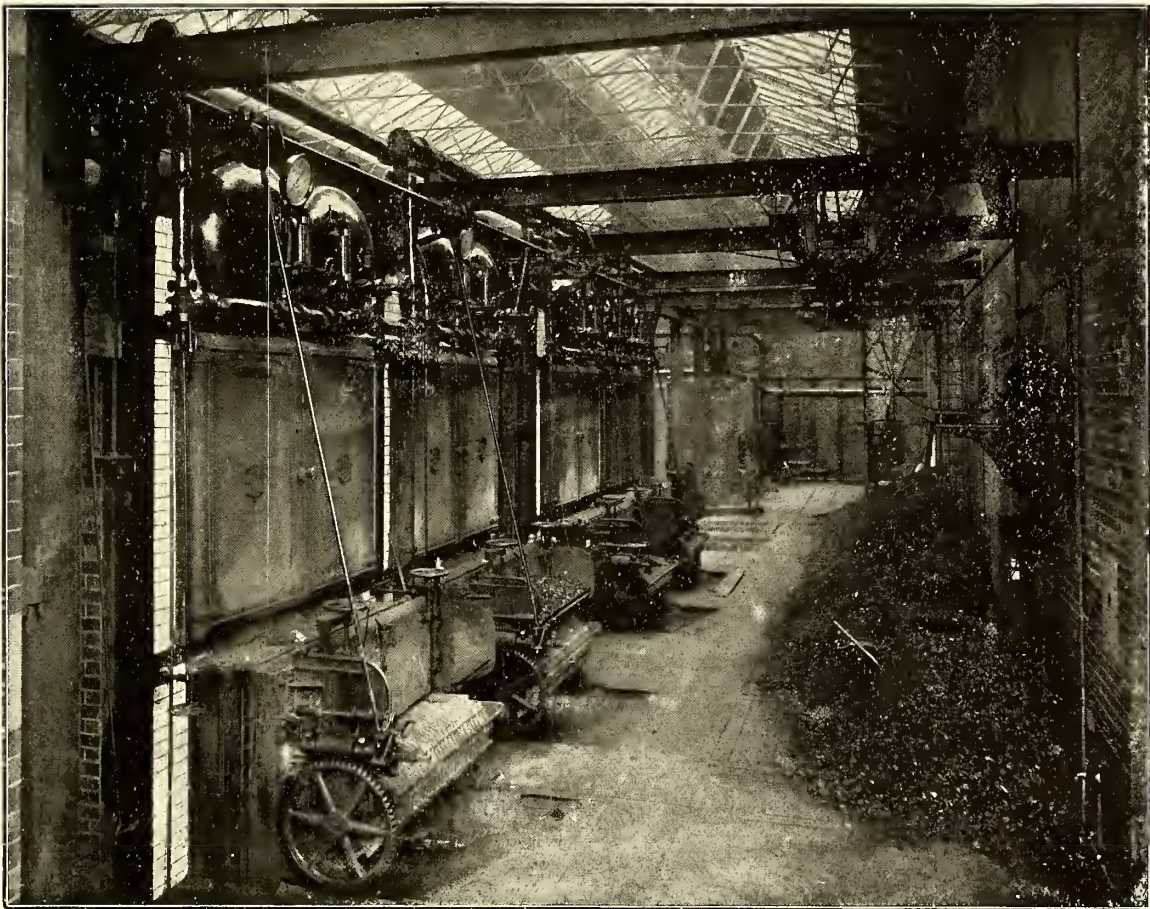
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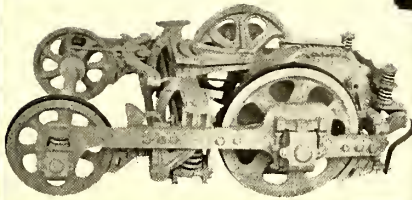
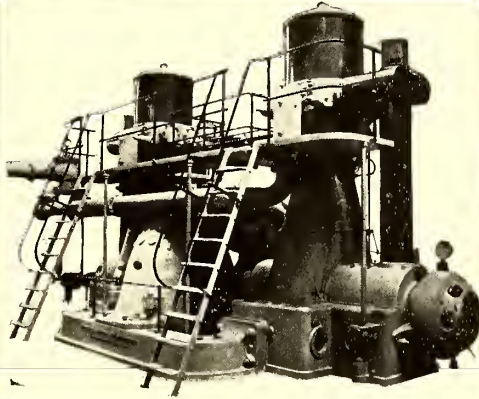
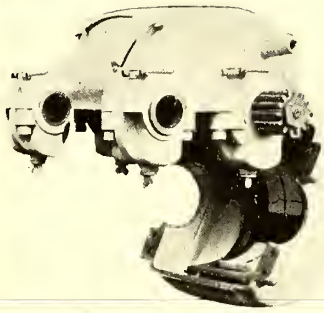
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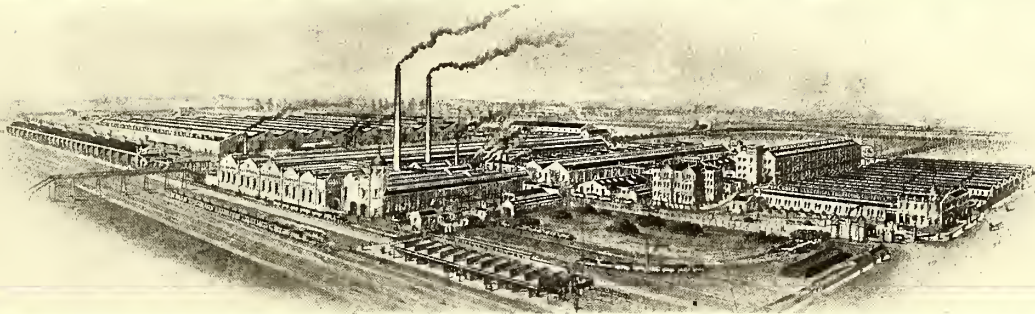
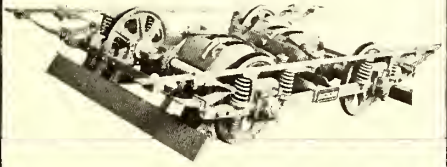
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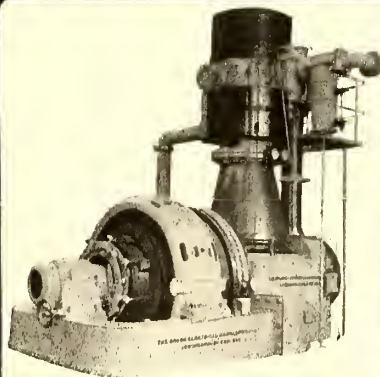
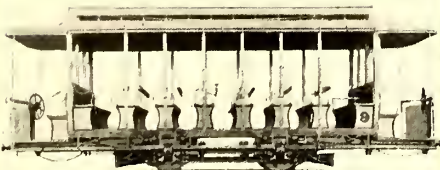
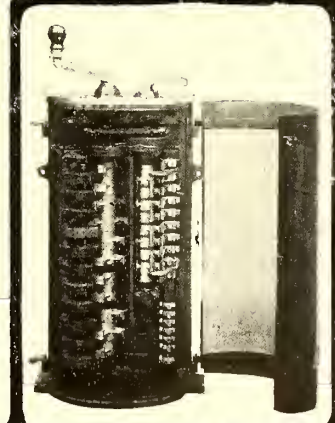
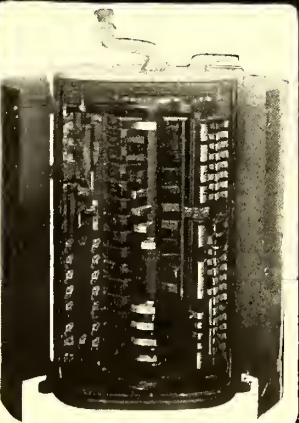
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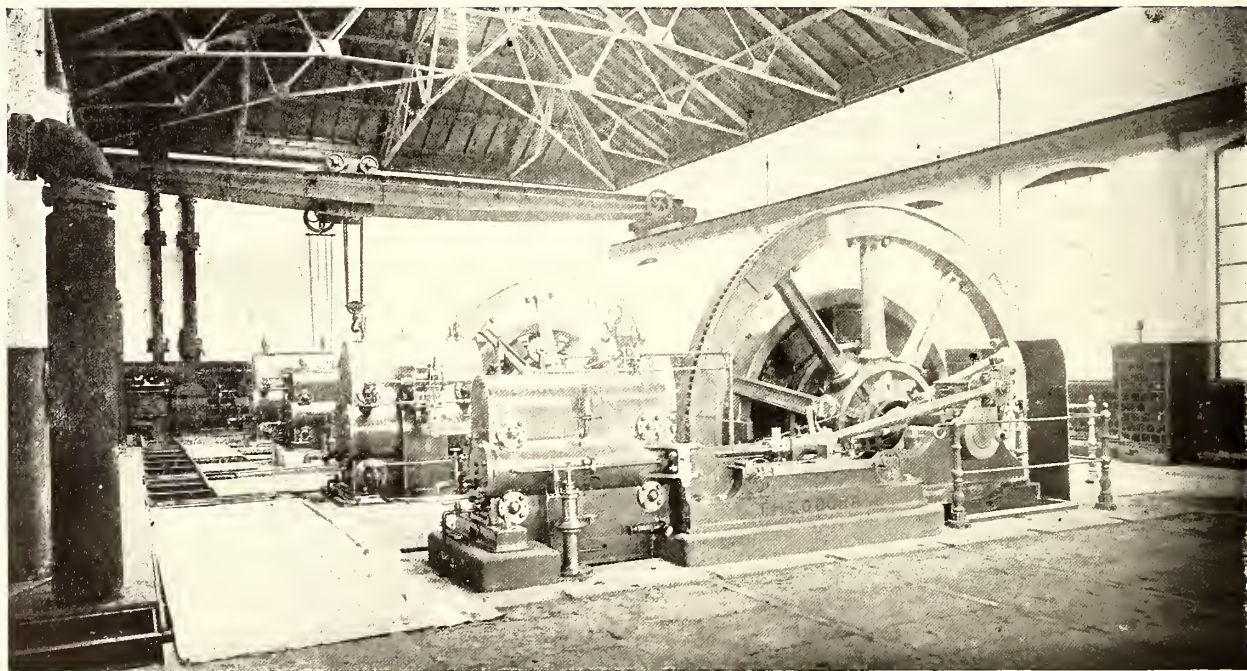
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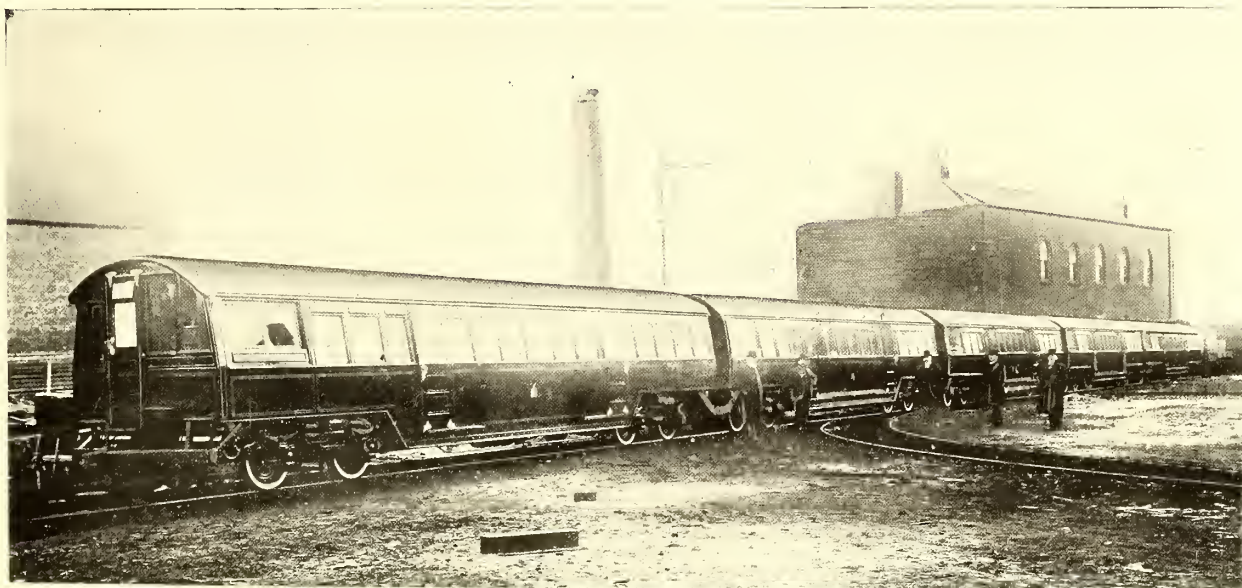
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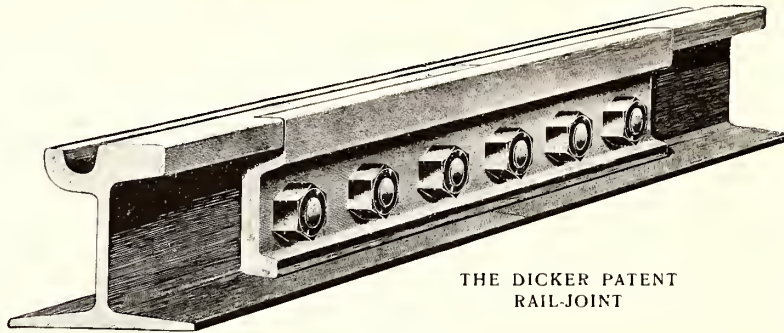
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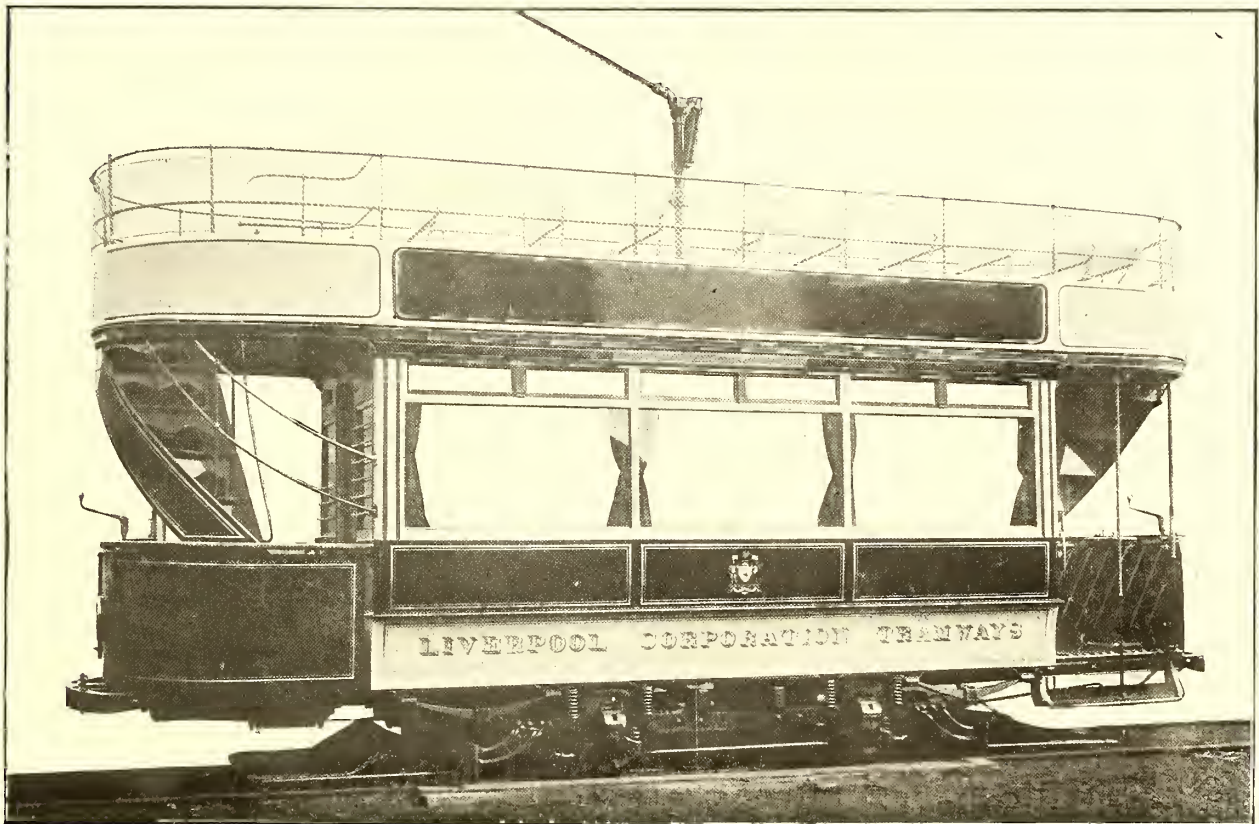
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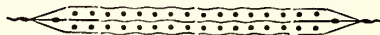
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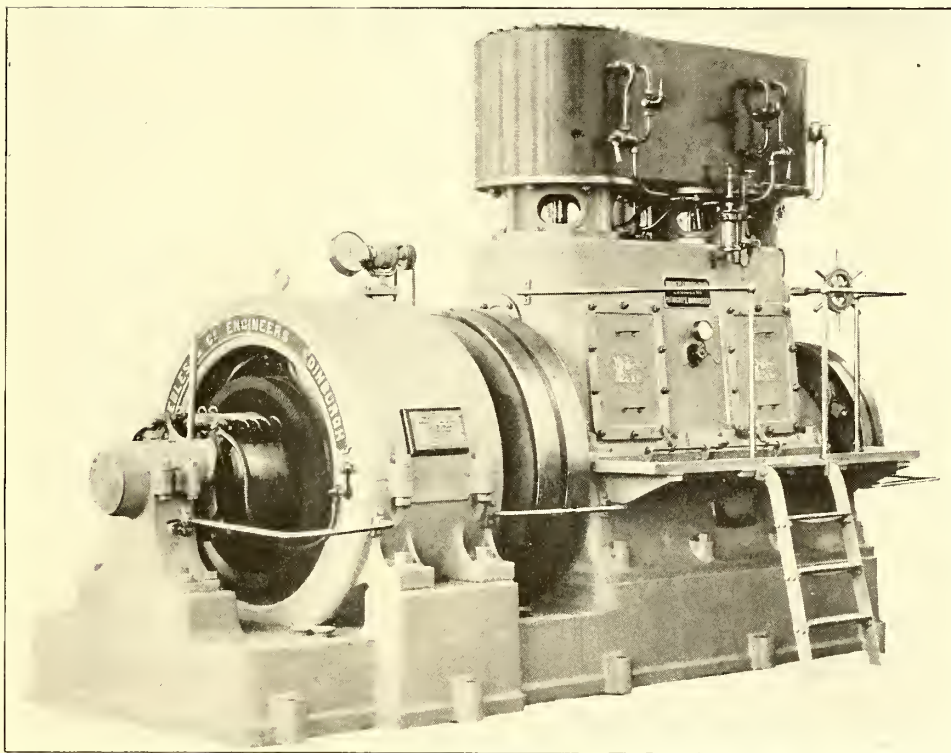
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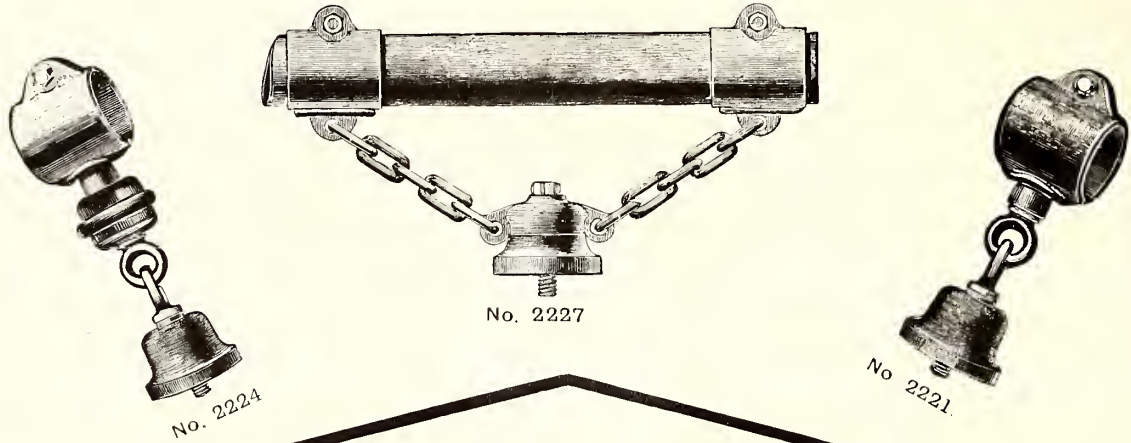
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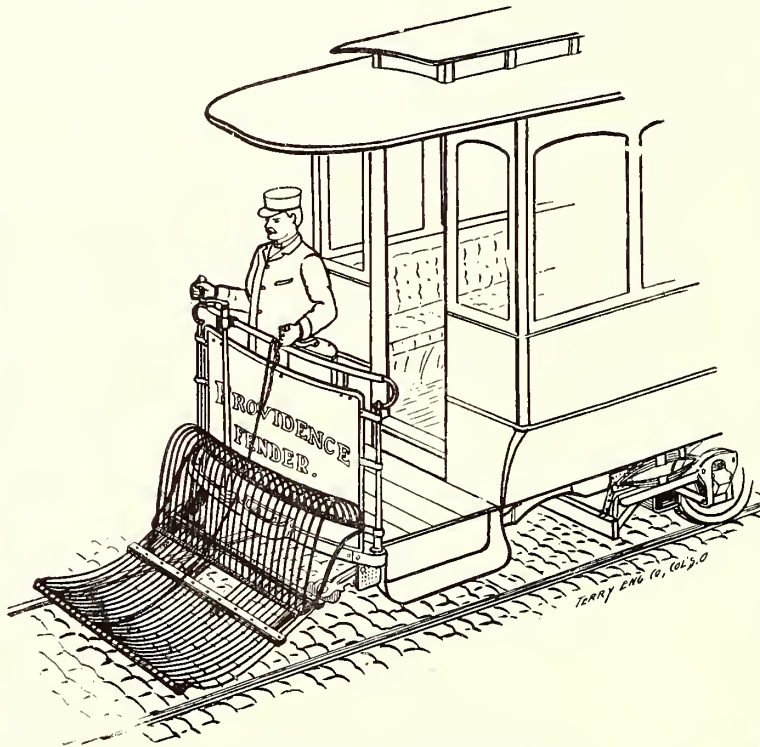
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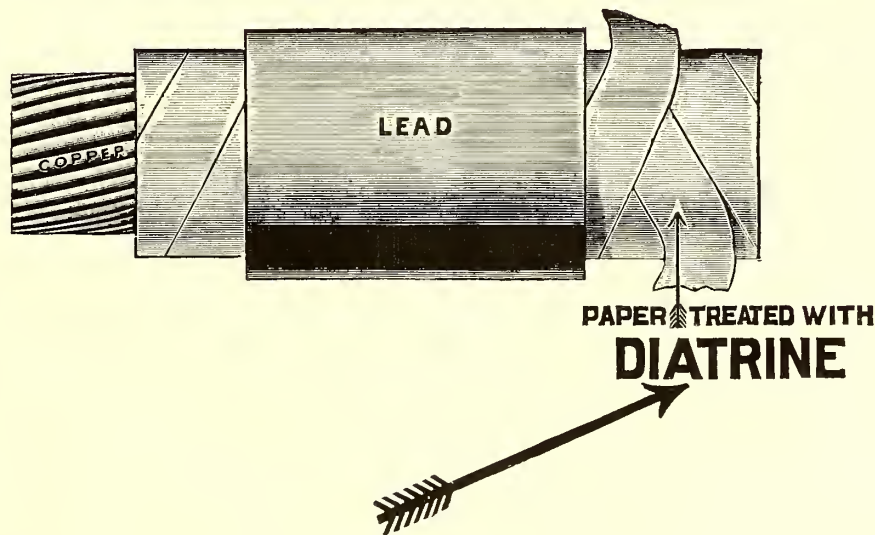
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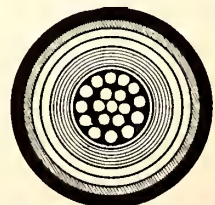
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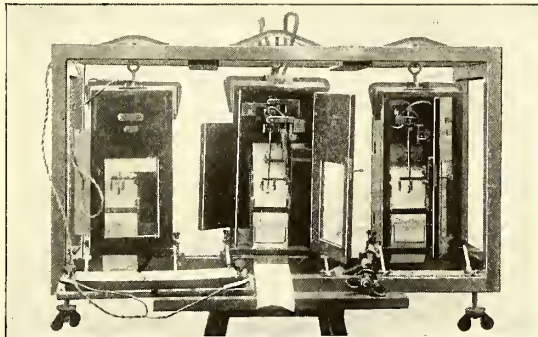
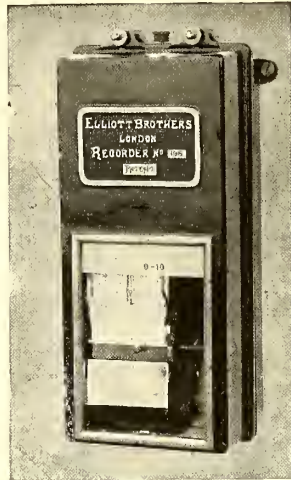
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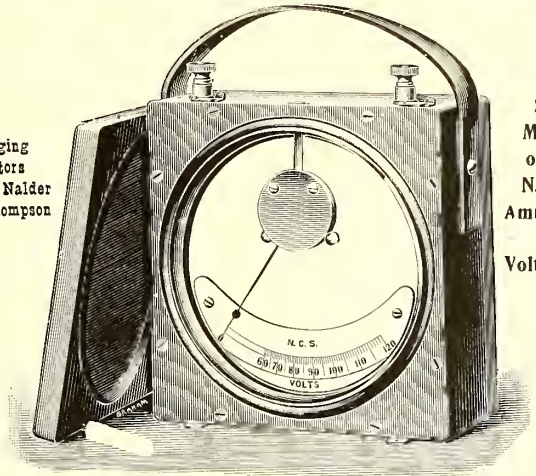
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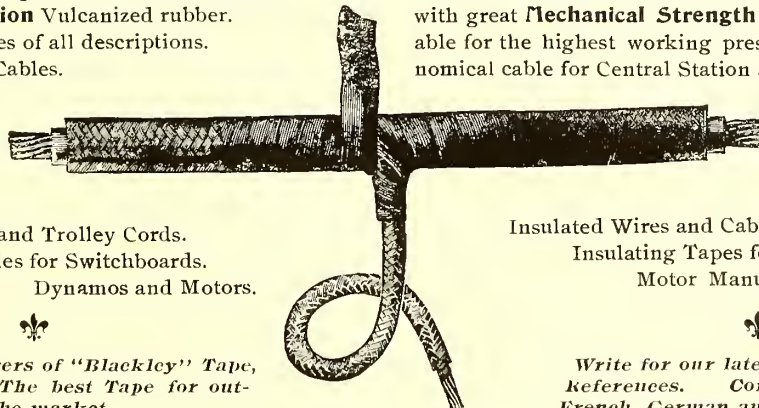
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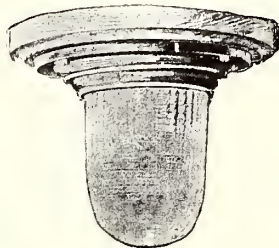
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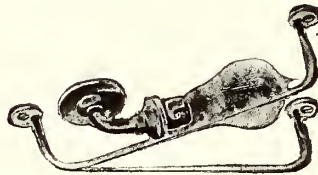
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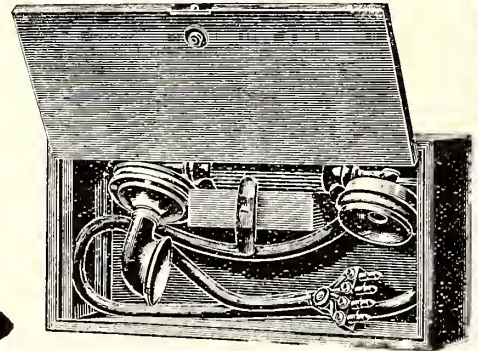
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R<sup>d</sup> No 370216

K 202

TELEPHONE PLUG BOX FOR FITTING INTO FEEDER PILLARS.



K 203 and K 204

### HANDCOMBINATION

with Watertight Microphone, but without Switch Key, and with the Flexible Cable terminating in a 4-Way Plug which fits the 4-Way Plug Socket of K 202.

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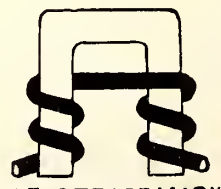


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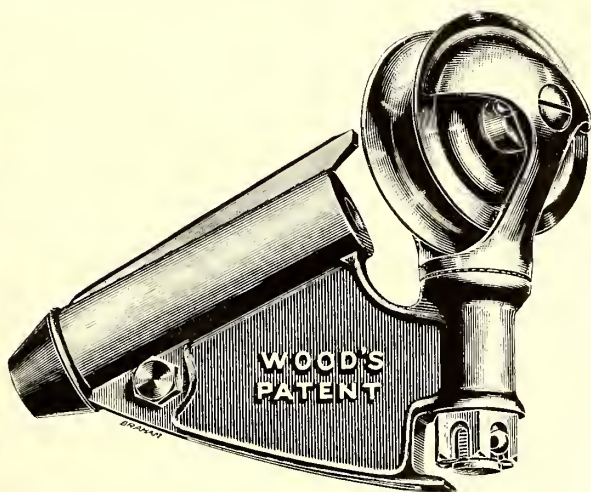
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# Manufacturers and Patentees of Traction Supplies

## SWIVEL TROLLEY HEAD

Wood's Patent No. 28839—1897 and 20983—1999



T 1101.

This Trolley Head embodies the whole of the improvements made during the last 5 years, and includes a Self-oiling arrangement consisting of a hardened hollow Steel Spindle with a slot cut through on the bottom. The spindle is filled with grease and will run for six weeks without attention.

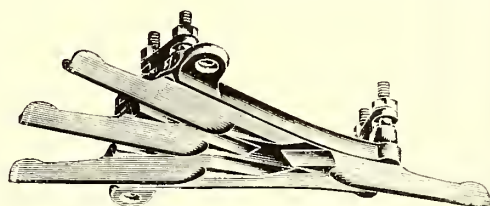
It is a pioneer head and the one which has first run with the rope tied up to the pole in Great Britain or America. Not a single accident has occurred with it during the five years it has been in continual use on many of the largest systems.

The method of insulation employed provides absolute security. It is formed in one piece and can be readily fixed by unskilled labour. The weight of the head is reduced to a minimum and the bearing surfaces are the largest obtainable and are provided with an adjustment which can be regulated to 1-60 of an Inch. The thrust from the wire is taken on a ball bearing, an arrangement which has been found necessary to all Swivelling Trolley Heads, and has been adopted by all leading lines in Great Britain and on the Continent.

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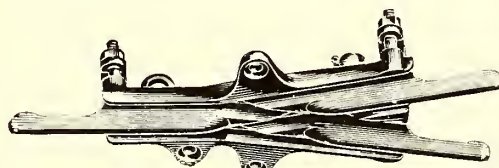
Wood's Patent No. 5171—1897

For Use in Connection with Swivel Trolley Head



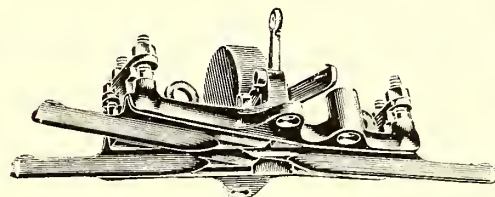
T 322.

3-WAY FROG FIXED.



T 318.

FIXED POINT.



T 324.

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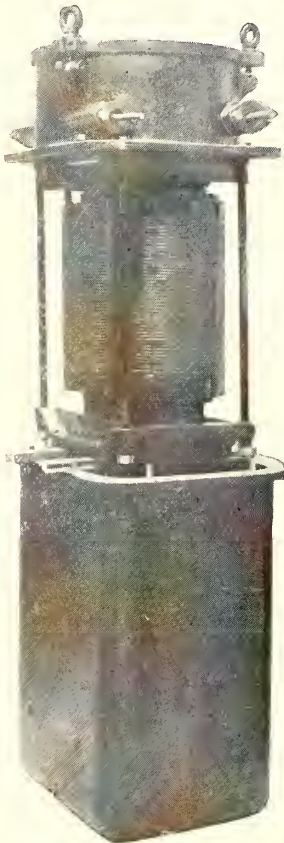
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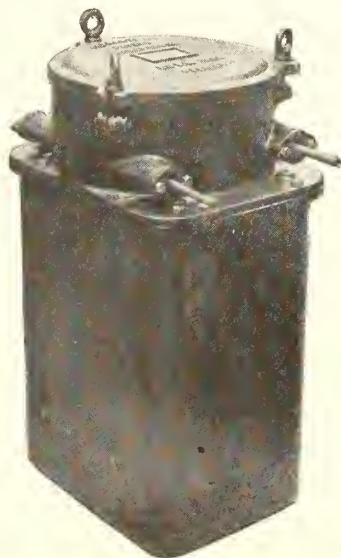
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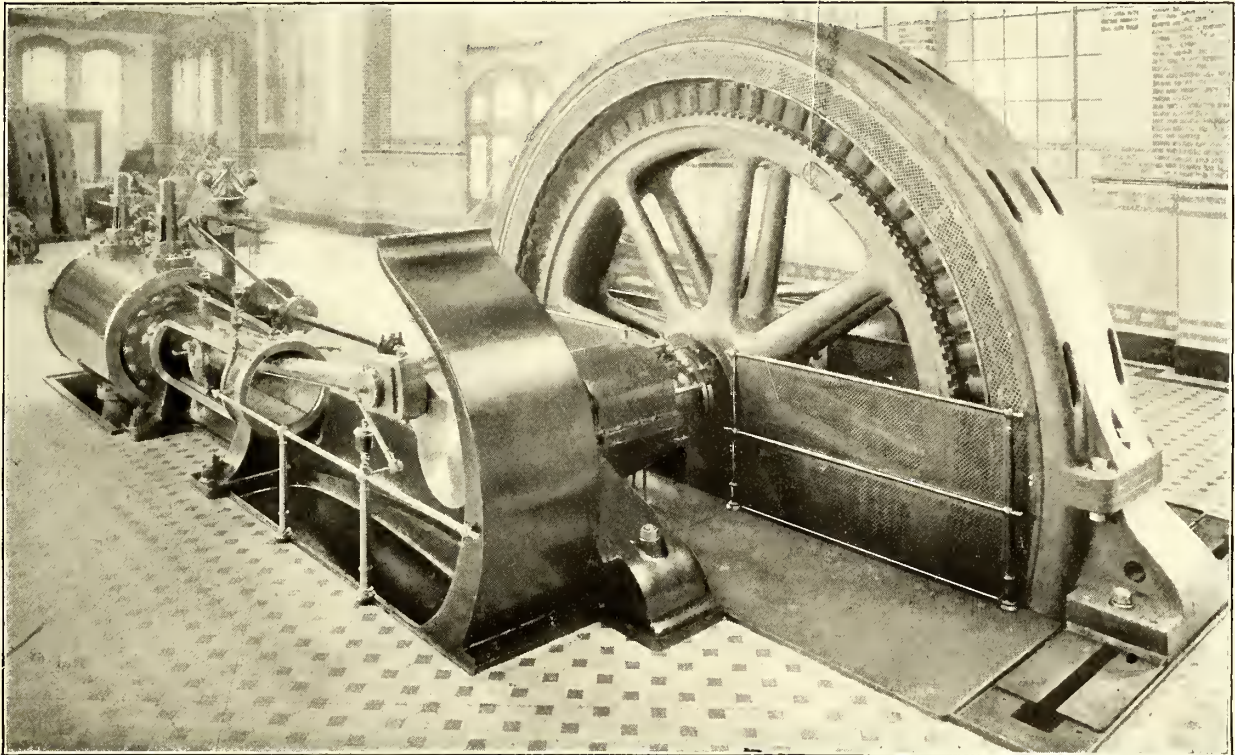


THESE ILLUSTRATIONS  
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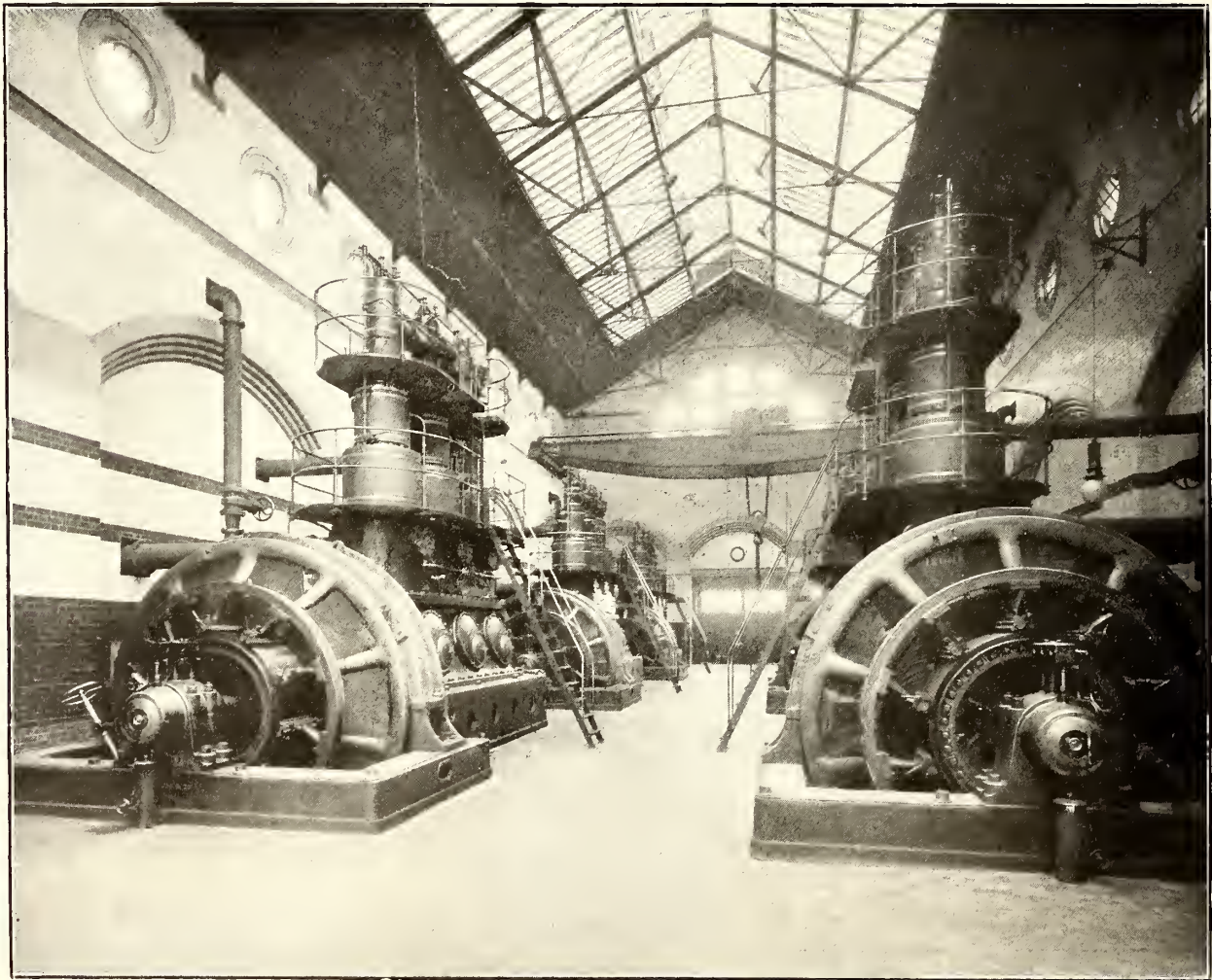


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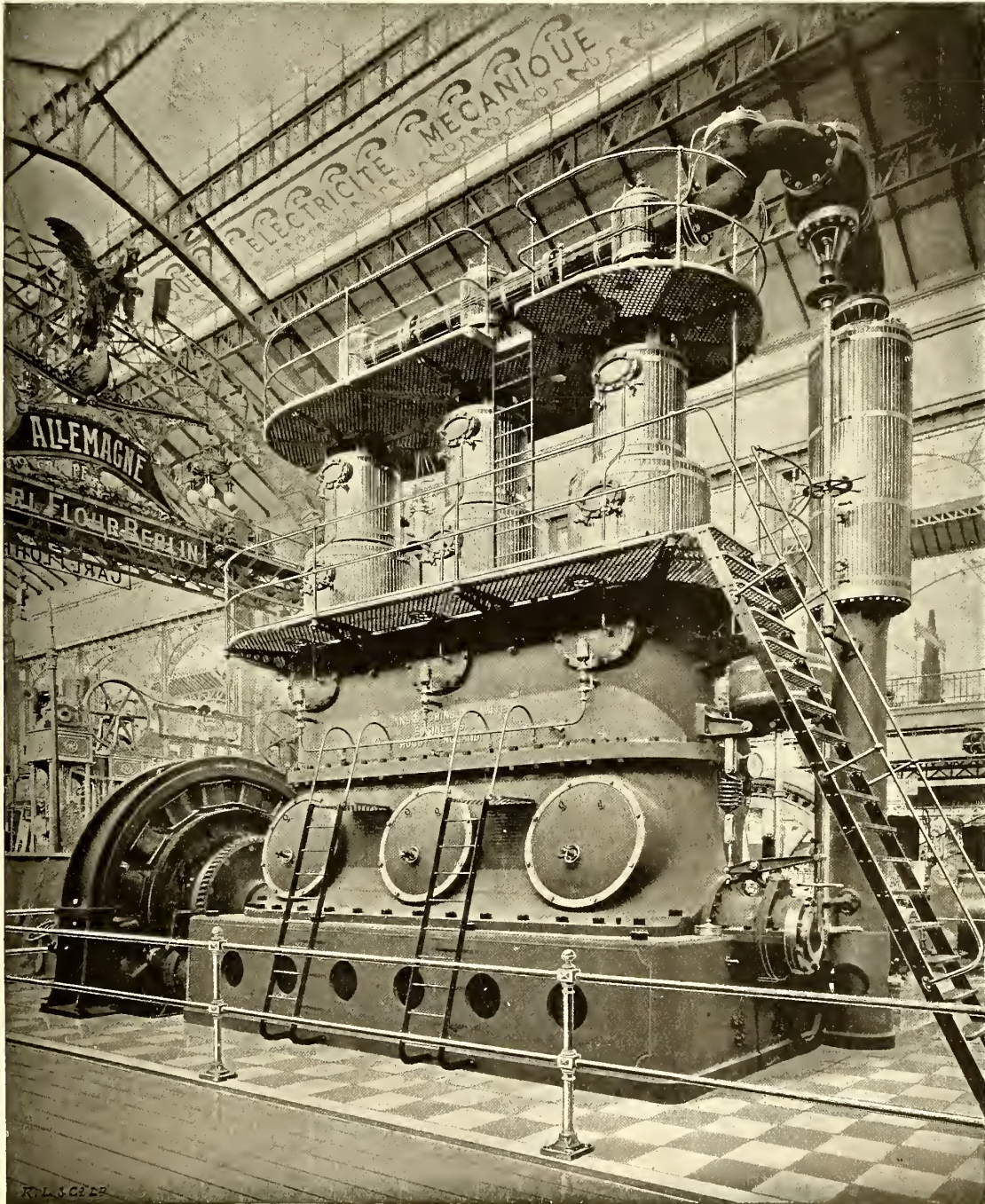
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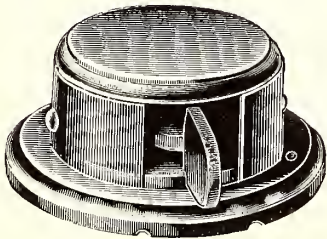
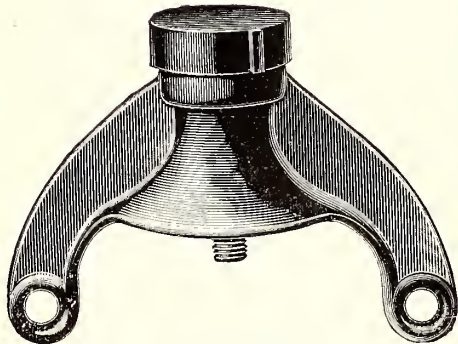
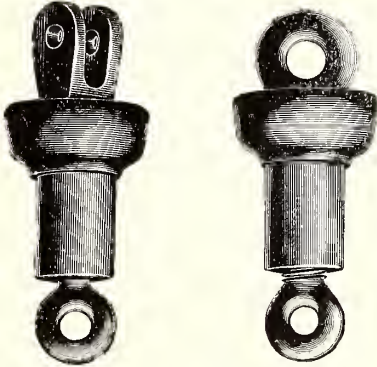
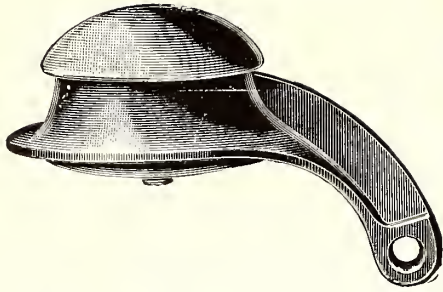


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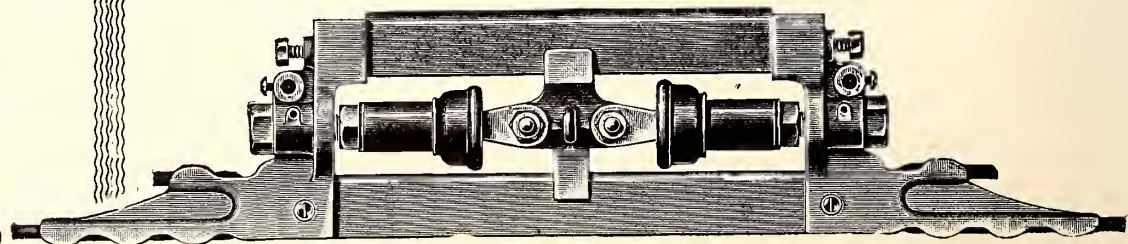
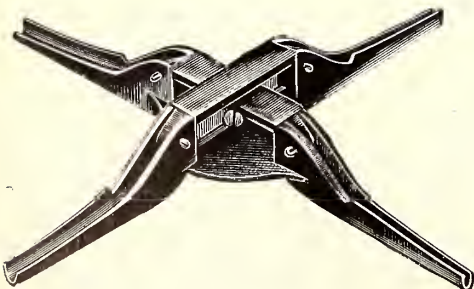
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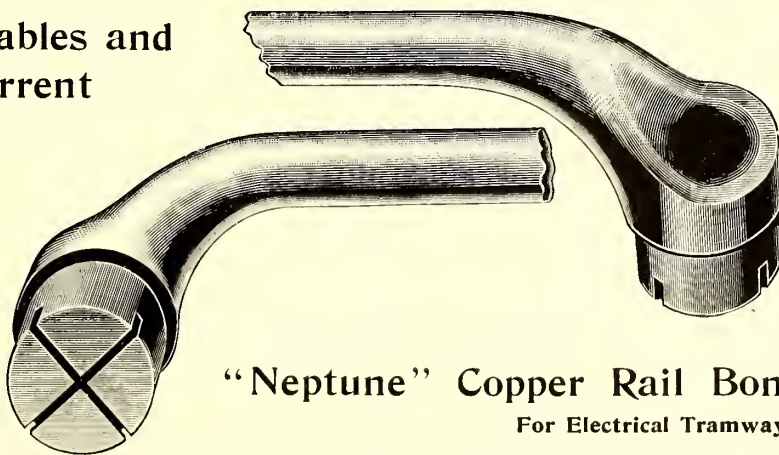
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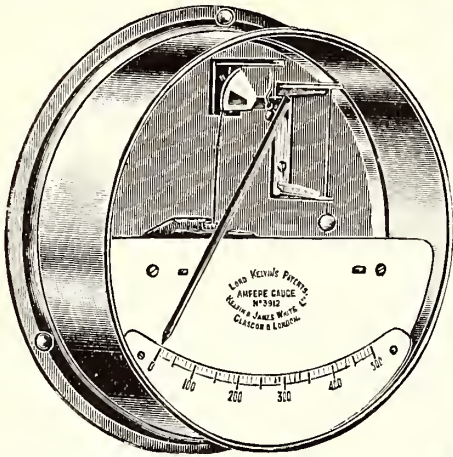
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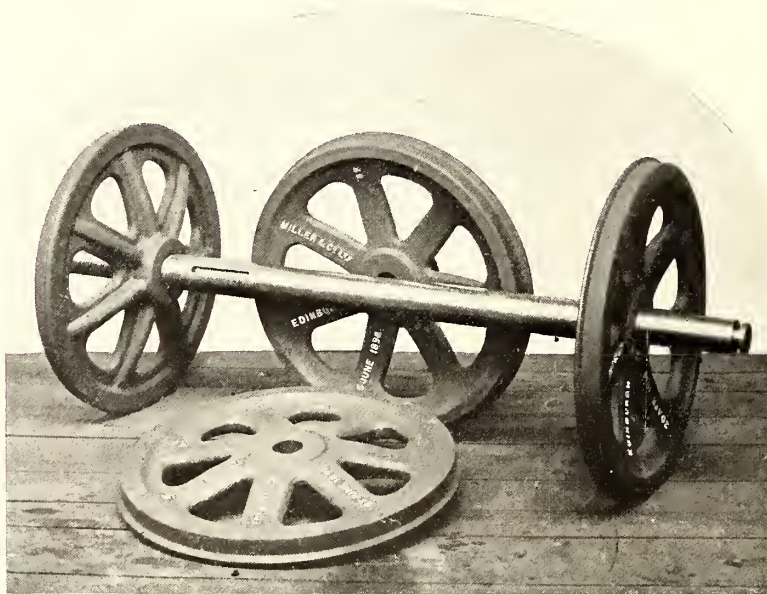
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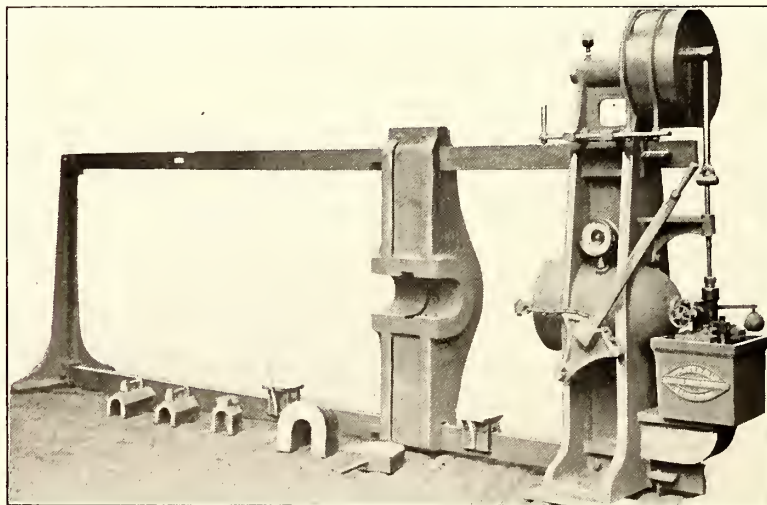
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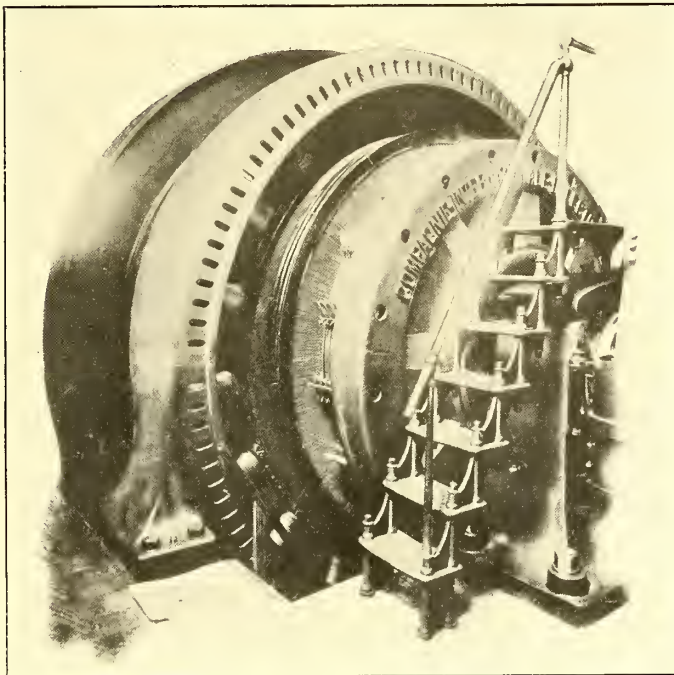


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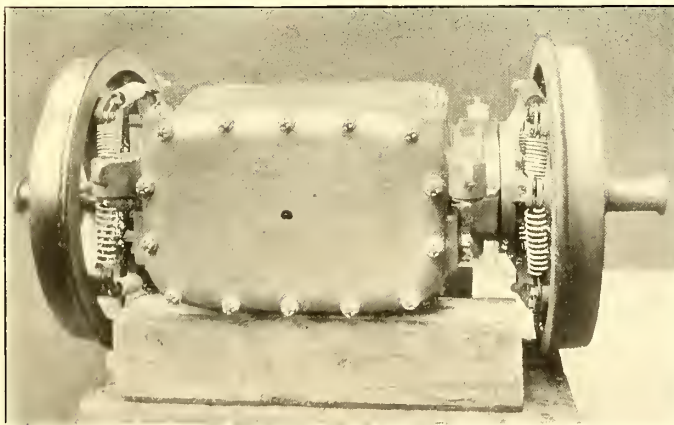
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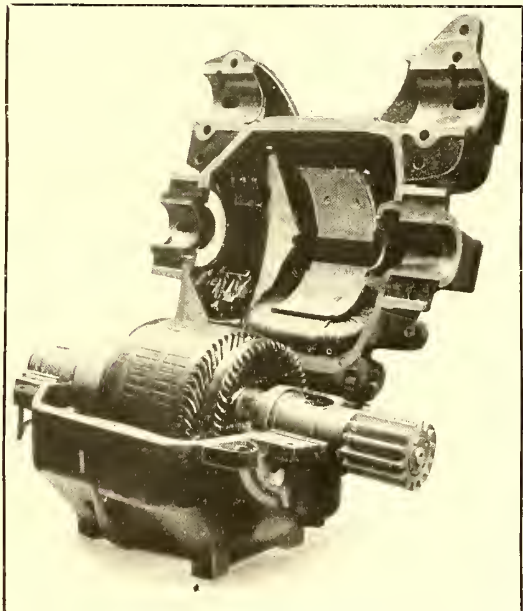
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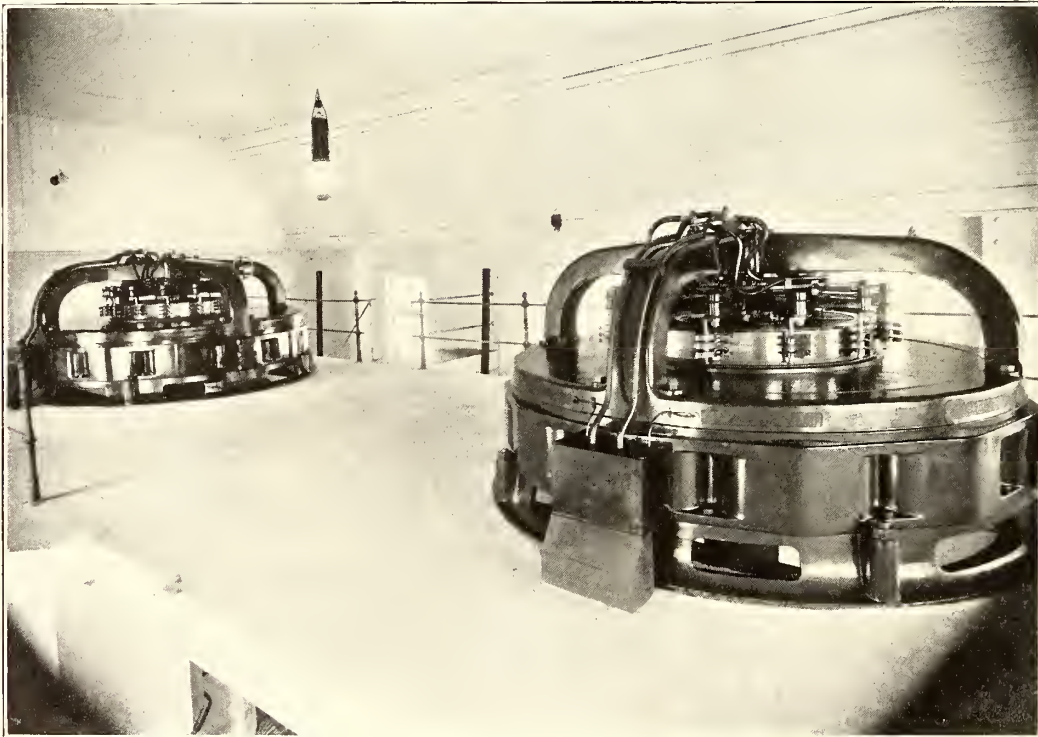
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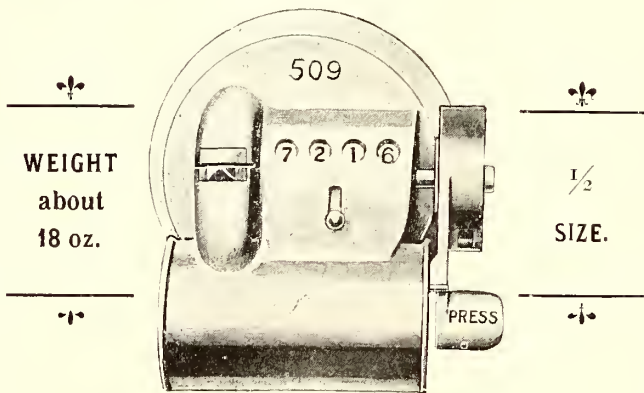
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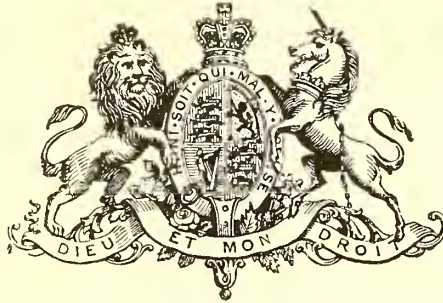
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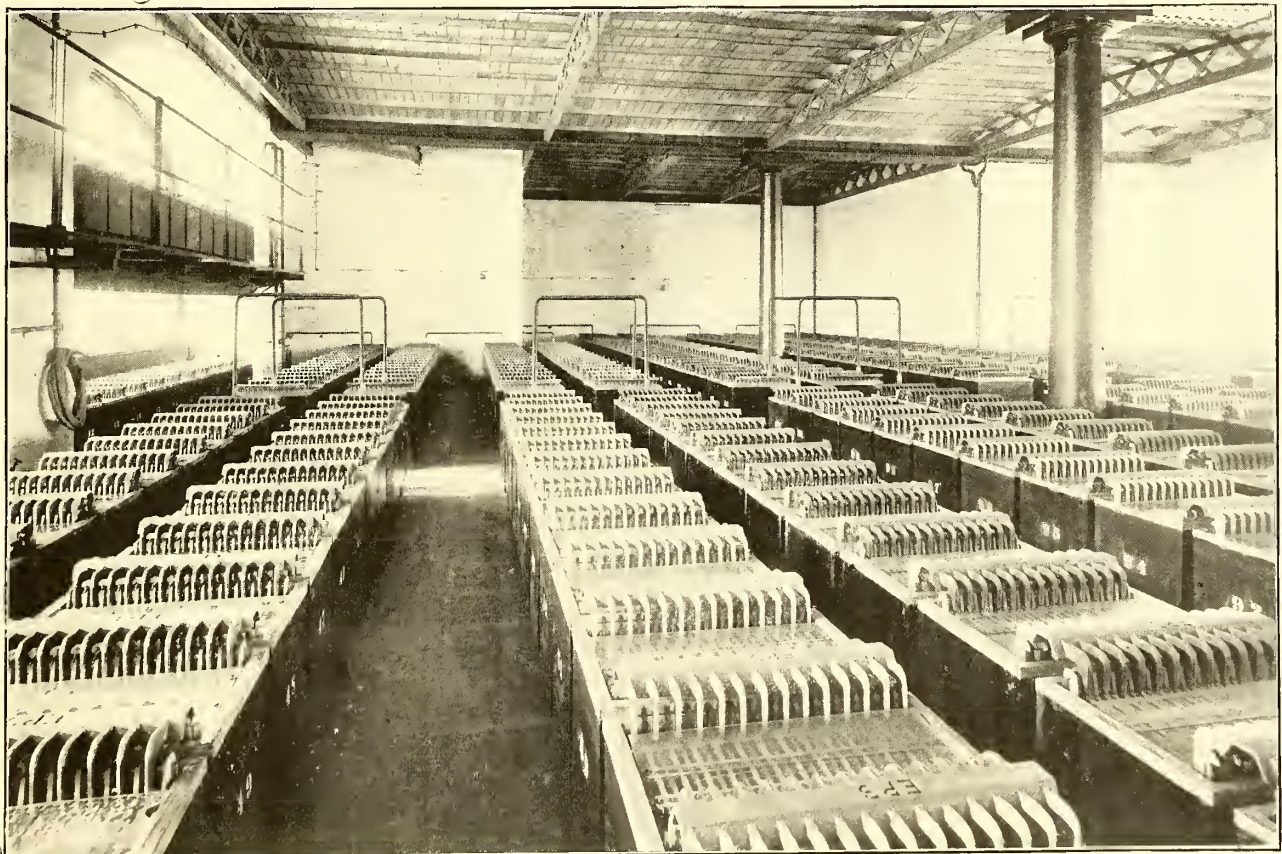
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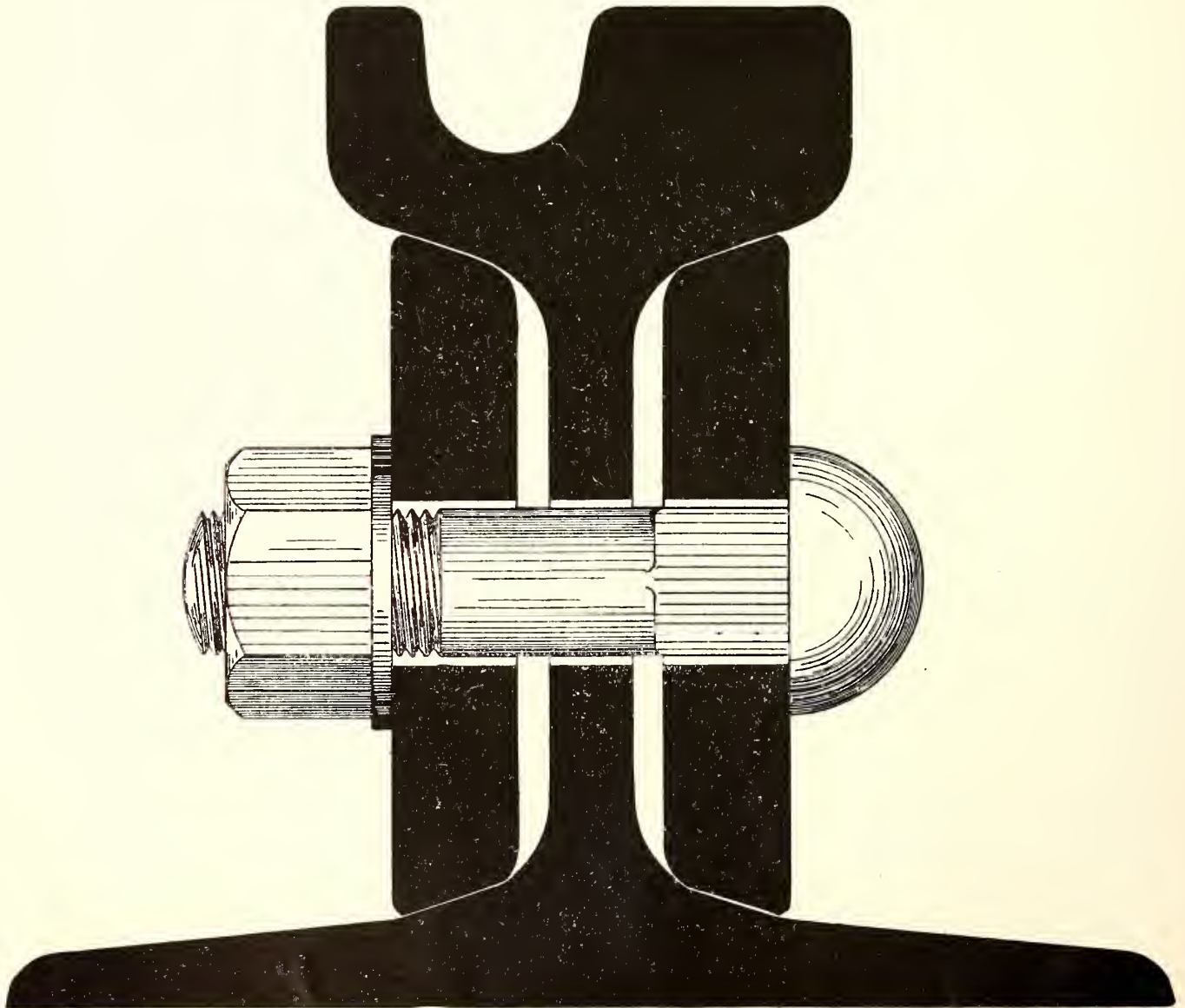
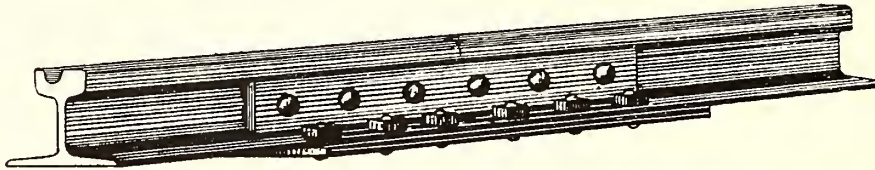
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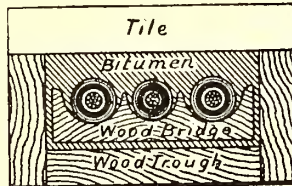
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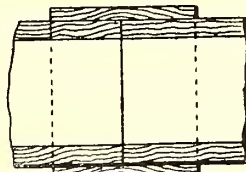
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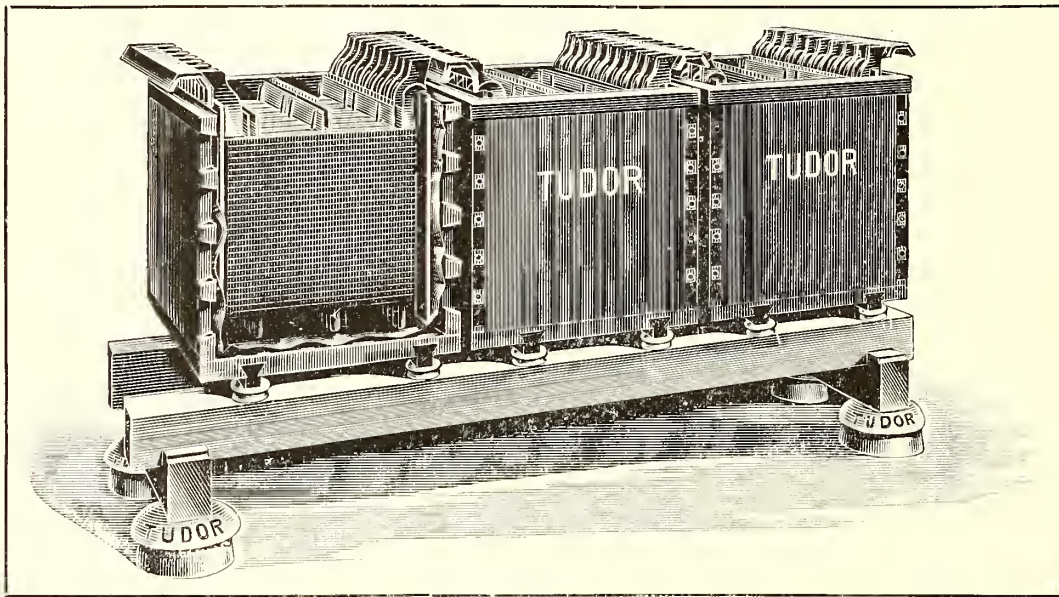


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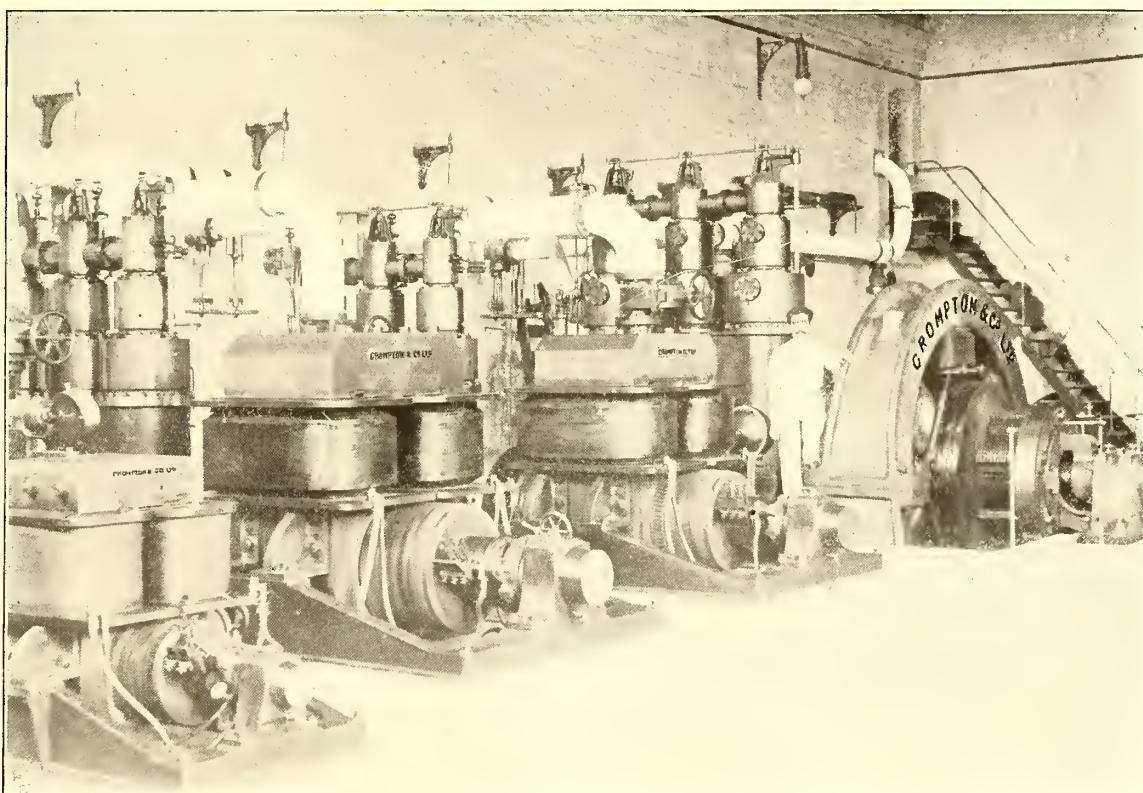
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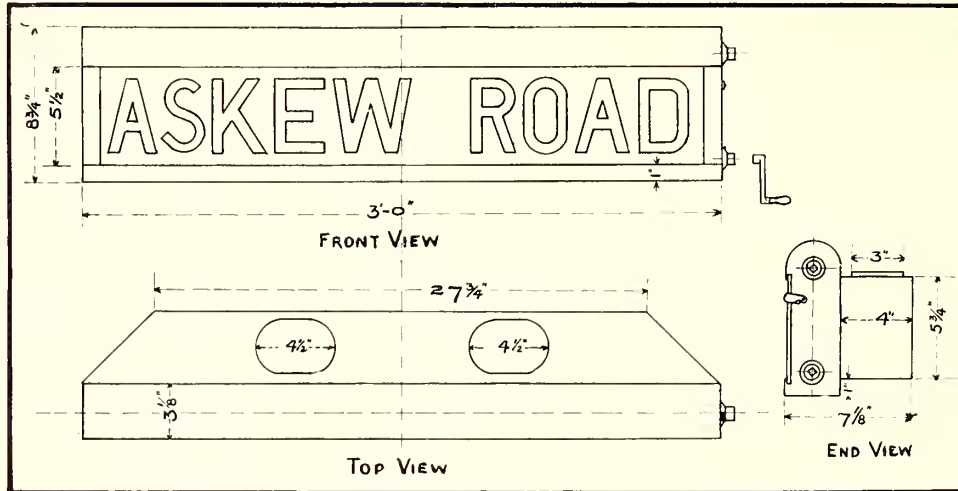
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CODES USED—A 1; Engineering, Ager's Telegram; Moreing & Neil's New Mining and General; Lieber's; and the A B C, 4th Edition.

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Manufactured by the British Electric Car Company, Limited, in use on many of the principal systems in the United Kingdom and Continent.



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The distinctive feature of this device is an arrangement for displaying, by day as well as by night, the various terminals of any system. The names of these terminals are carefully printed on a continuous rotating screen of strong linen, the ground being black and the letters left white. By means of an electric lamp inside the frame the letters are shown as clearly by night as by day, the linen acting as a transparency.

The number of destinations that may be provided on each screen is practically unlimited, so that any car may be run over any route without the usual delay in changing signboards. Various types of standard frames are made.

The drawing shows the Standard type, consisting of a plain frame showing the destinations only. Other types, one of which is shown in the accompanying cut, are fitted with a hood over the destination to carry a single or a double bull's eye or prism glass. Slides are arranged behind the lenses to receive various coloured glasses.

## THE BRITISH ELECTRIC CAR COMPANY, Limited

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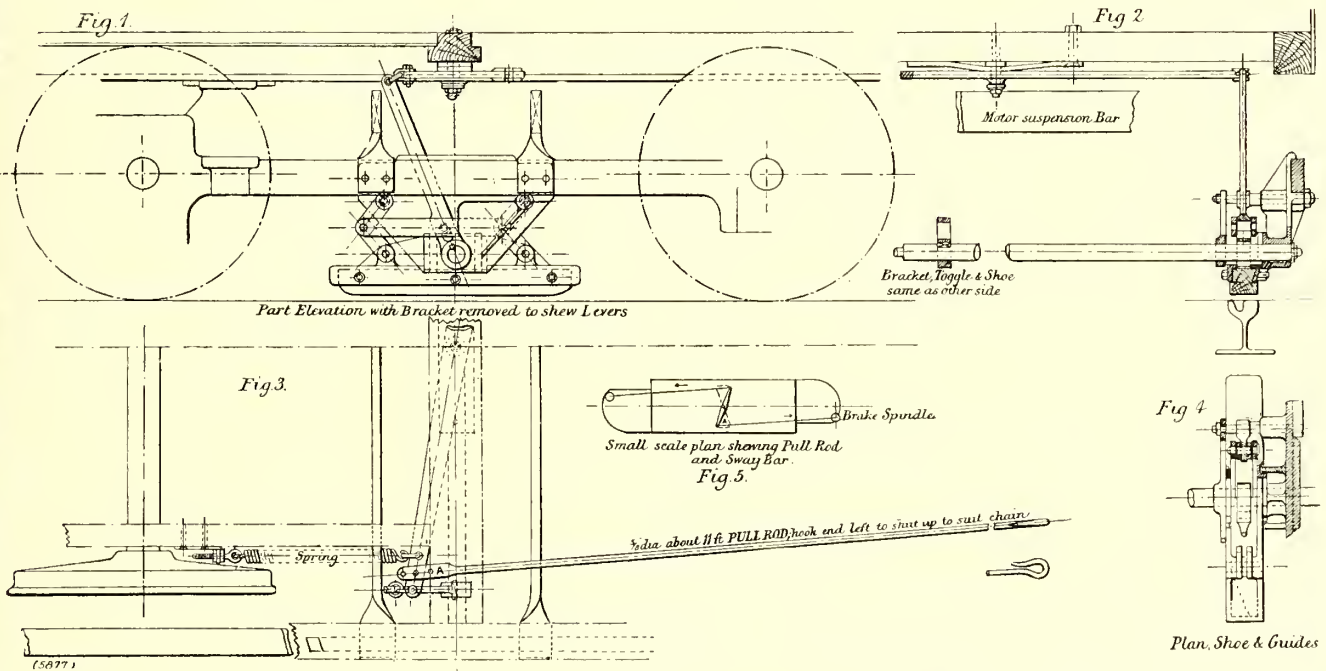
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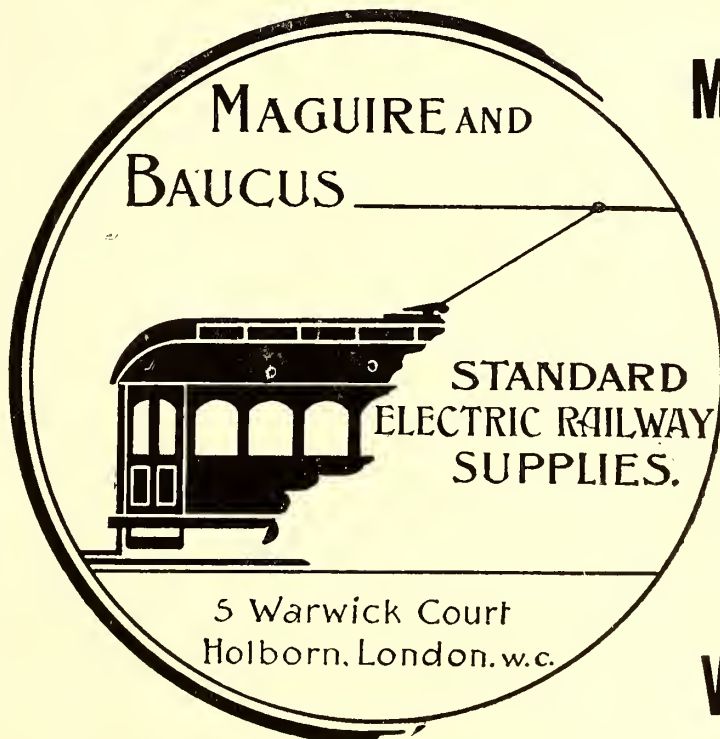
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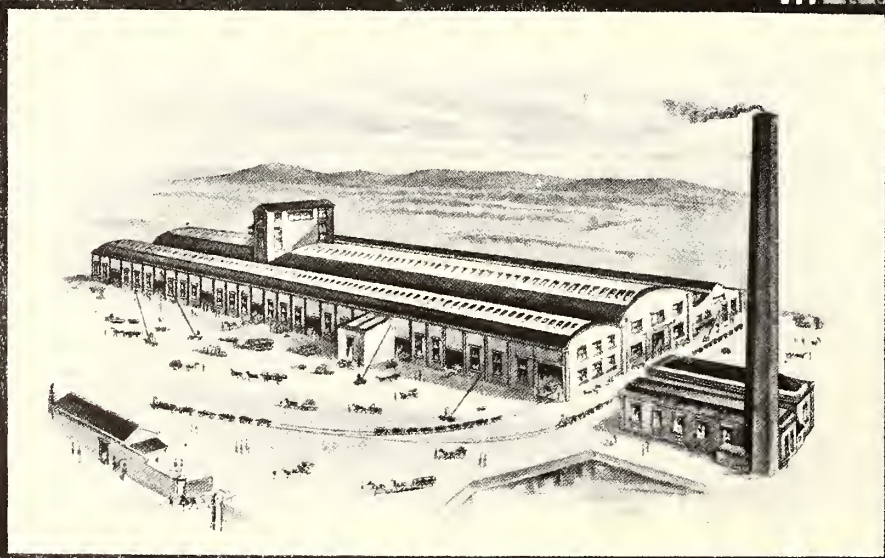
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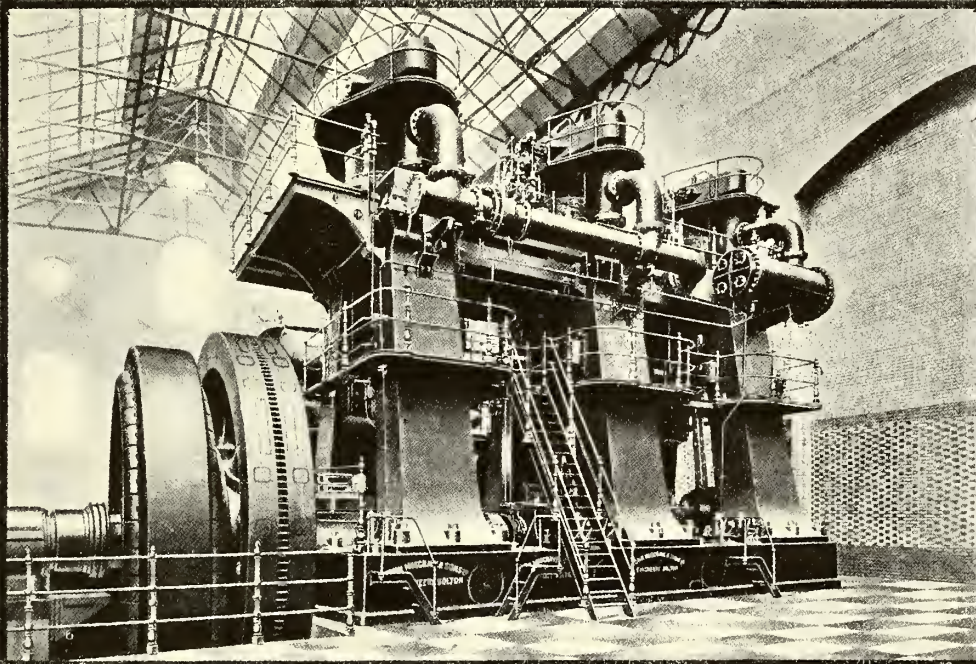
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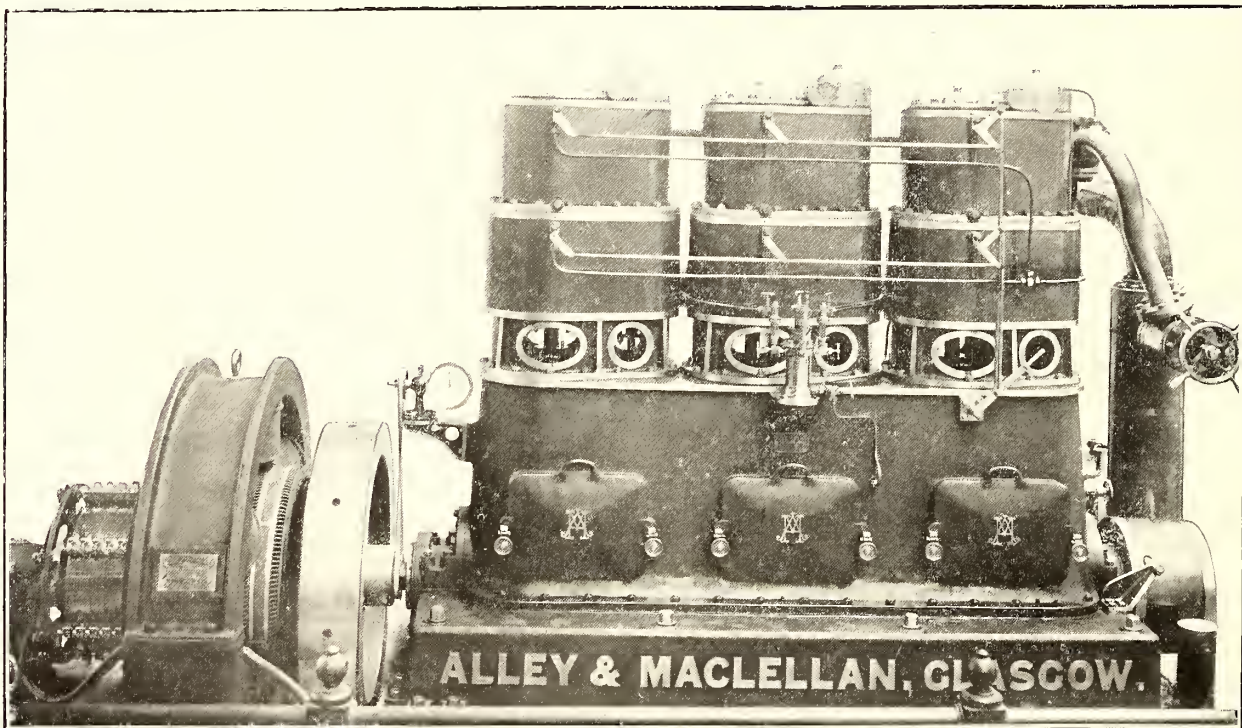
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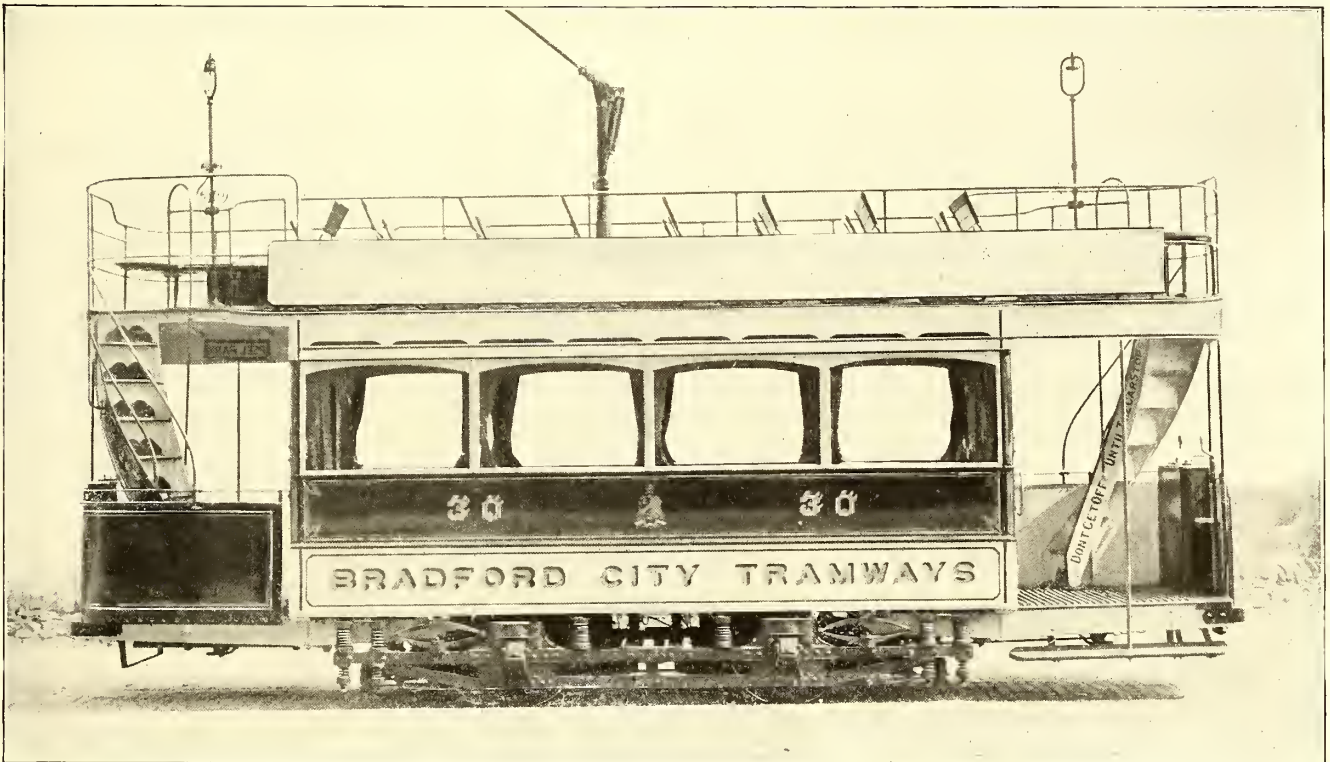
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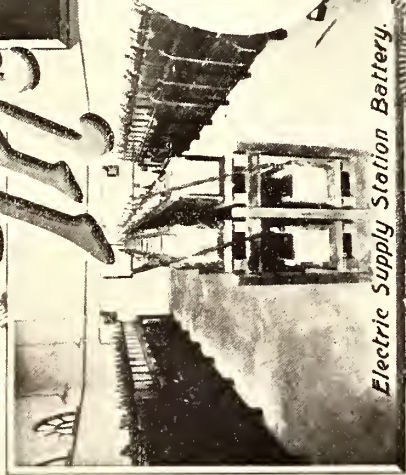
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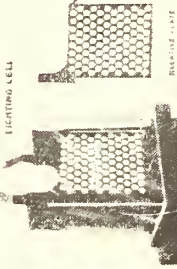
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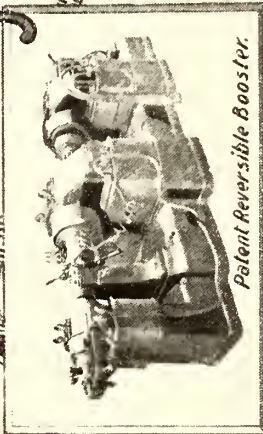
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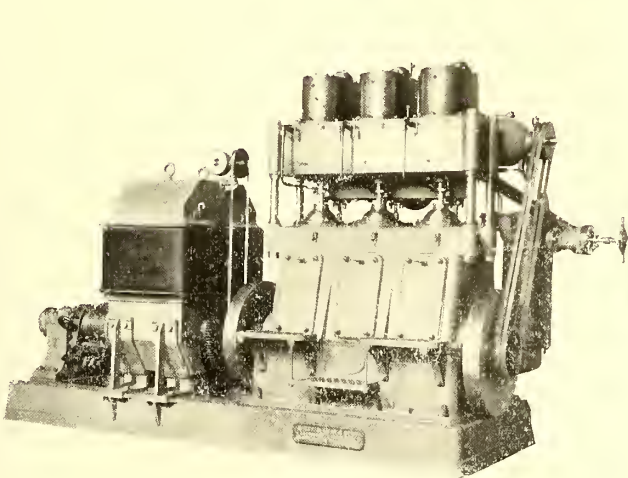


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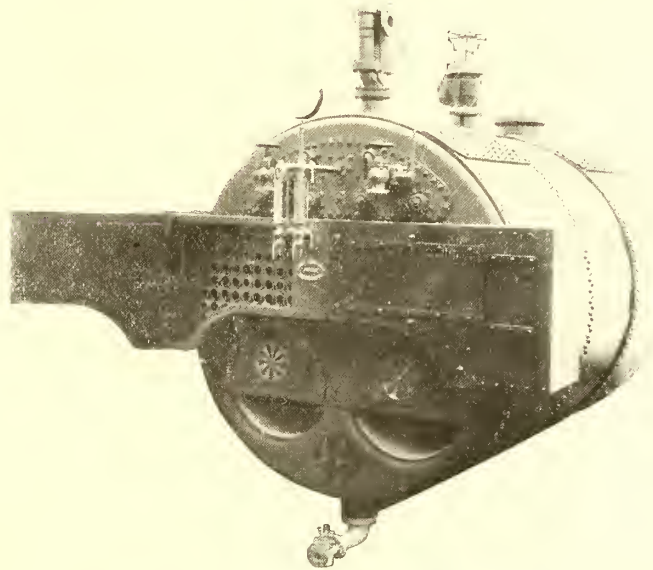
LIMITED

==== Engineers ====

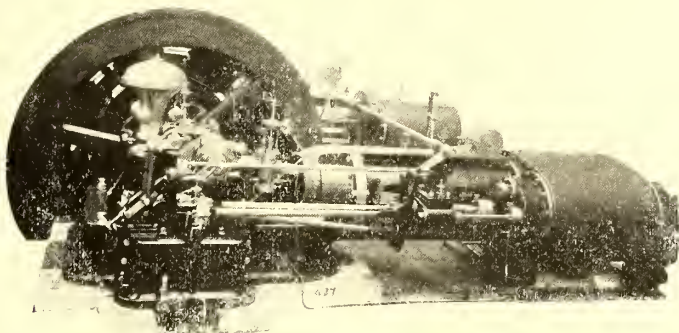
## COLCHESTER, ENGLAND



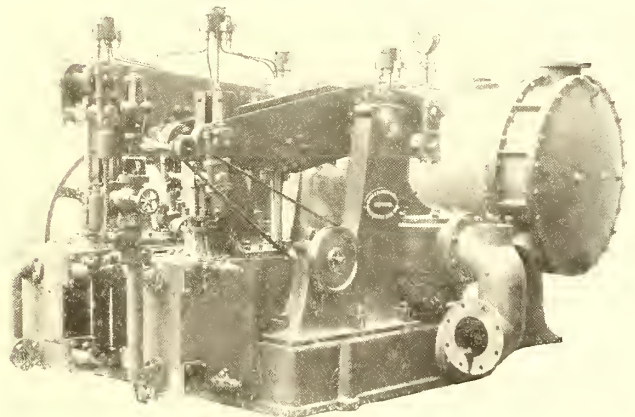
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**N**OUS avons l'honneur d'annoncer la nomination de M. Victor Dourin, Rue Boudreau 4 à Paris et Rue de la Montagne 28 à Bruxelles, comme notre représentant en France, Belgique, Hollande, Espagne, Portugal et Suisse pour la vente de nos articles pour tramways qui embrassent spécialement: roues dentées et engrenages, pignons et trolleys. Notre maison est la plus ancienne d'Amérique à manufacturer ces produits; nos ateliers sont les plus considérables et nulle part nos facilités ne sont égales. M. Dourin se fera un plaisir de vous fournir sur demande catalogues et prix-courant, et nous espérons qu'il recevra une large part de vos commandes.

**R. D. NUTTALL COMPANY**  
Pittsburg, Pennsylvania, États Unis d'Amérique

**T**ENEMOS gusto en participarle que hemos nombrado al Sr. Victor Dourin, núm 4 Rue Boudreau, Paris, y núm 28 Rue de la Montagne, Bruselas, nuestro representante, en Francia, Bélgica, Holanda, España, Portugal, y Suecia, para la venta de nuestros artefactos de Tranvías, siendo nuestra especialidad Ruedas dentadas, Piñones y Ruedas para el contacto de la barra de conducción electrico. Somos los primeros en este ramo en América; nuestras fábricas son las más grandes, y nuestra facilidad es sin igual en todas partes. El Sr. Dourin tendrá mucho gusto en surtir catálogos y dar precios á quien lo pida, y esperamos obtener parte de sus pedidos.

**R. D. NUTTALL COMPANY**  
Pittsburgh, Pennsylvania, E. U. de A.

**W**IR beehren uns hiermit anzuzeigen, dass wir die Herren Albert Thode & Co., 25 Königsstrasse, Hamburg, mit unserer Vertretung in Deutschland behufs Vertriebs unserer Trambahn-Bedarfsartikel, worunter Transmissionsräder, Triebel und Trolleys unsere Spezialitäten bilden, beauftragt haben. In diesem Geschäftszweige haben wir in Amerika bahnbrechend gewirkt; unsere Werke sind die grössten in ihrer Art und unsere Fazilitäten stehen unübertroffen da. Mit Vergnügen werden Ihnen die Herren Thode & Co. auf Verlangen Kataloge und Preislisten übermitteln, und hoffen wir, dass Sie uns einen bedeutenden Anteil Ihrer Bestellungen zukommen lassen werden.

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**C**I PREGIAMO ANNUNCIARE che il signor Giovanni Checchetti, Via Tomaso Grossi N. 2 Milano, è stato nominato nostro rappresentante in Italia per la vendita di accessori per tramway e principalmente per le vostre specialità, che sono: ruote ad ingranaggio, ruote conduttrici di elettricità e pignoni. Noi siamo una delle più vecchie case d'America in questa Industria: i nostri stabilimenti sono i più grandi del genere ed il nostro impianto non è superato altrove.

Il Signor Checchetti sarà lieto di fornirvi cataloghi e prezzi dietro semplice richiesta e speriamo di potere ottenere una buona parte dei vostri ordini.

**R. D. NUTTALL COMPANY**  
Pittsburg, Pennsylvania, U. S. A.

**W**IR beehren uns hiermit anzuzeigen, dass wir die Böhmisches Elektricitäts Gesellschaft W. Suchanek & Co., Jungmannstrasse 26, Prag, mit unserer Vertretung in Oesterreich für das Königreich Böhmen und die tschechischen Kreise behufs Vertriebs unserer Trambahn-Bedarfsartikel, worunter Transmissionsräder, Triebel und Trolleys unsere Spezialitäten bilden, beauftragt haben. In diesem Geschäftszweige haben wir in Amerika bahnbrechend gewirkt; unsere Werke sind die grössten in ihrer Art und unsere Fazilitäten stehen unübertroffen da. Mit Vergnügen werden Ihnen die Herren Suchanek & Co. auf Verlangen Kataloge und Preislisten übermitteln, und hoffen wir, dass Sie uns einen bedeutenden Anteil Ihrer Bestellungen zukommen lassen werden.

**R. D. NUTTALL COMPANY,**  
Pittsburg, Pennsylvania, U. S. A.

**W**IR beehreu uns hiermit anzuzeigen, dass wir die Herren Blau es Lukacs, Podmaniczky-Utca 2, Budapest VI, mit unserer Vertretung in Ungarn behufs Vertriebs unserer Trambahn-Bedarfsartikel, worunter Transmissionsräder, Triebel und Trolleys unsere Spezialitäten bilden, beauftragt haben. In diesem Geschäftszweige haben wir in Amerika bahnbrechend gewirkt; unsere Werke sind die grössten in ihrer Art und unsere Fazilitäten stehen unübertroffen da. Mit Vergnügen werden Ihnen die Herren Blau & Lukacs auf Verlangen Kataloge und Preislisten übermitteln, und hoffen wir, dass Sie uns einen bedeutenden Anteil Ihrer Bestellungen zukommen lassen werden.

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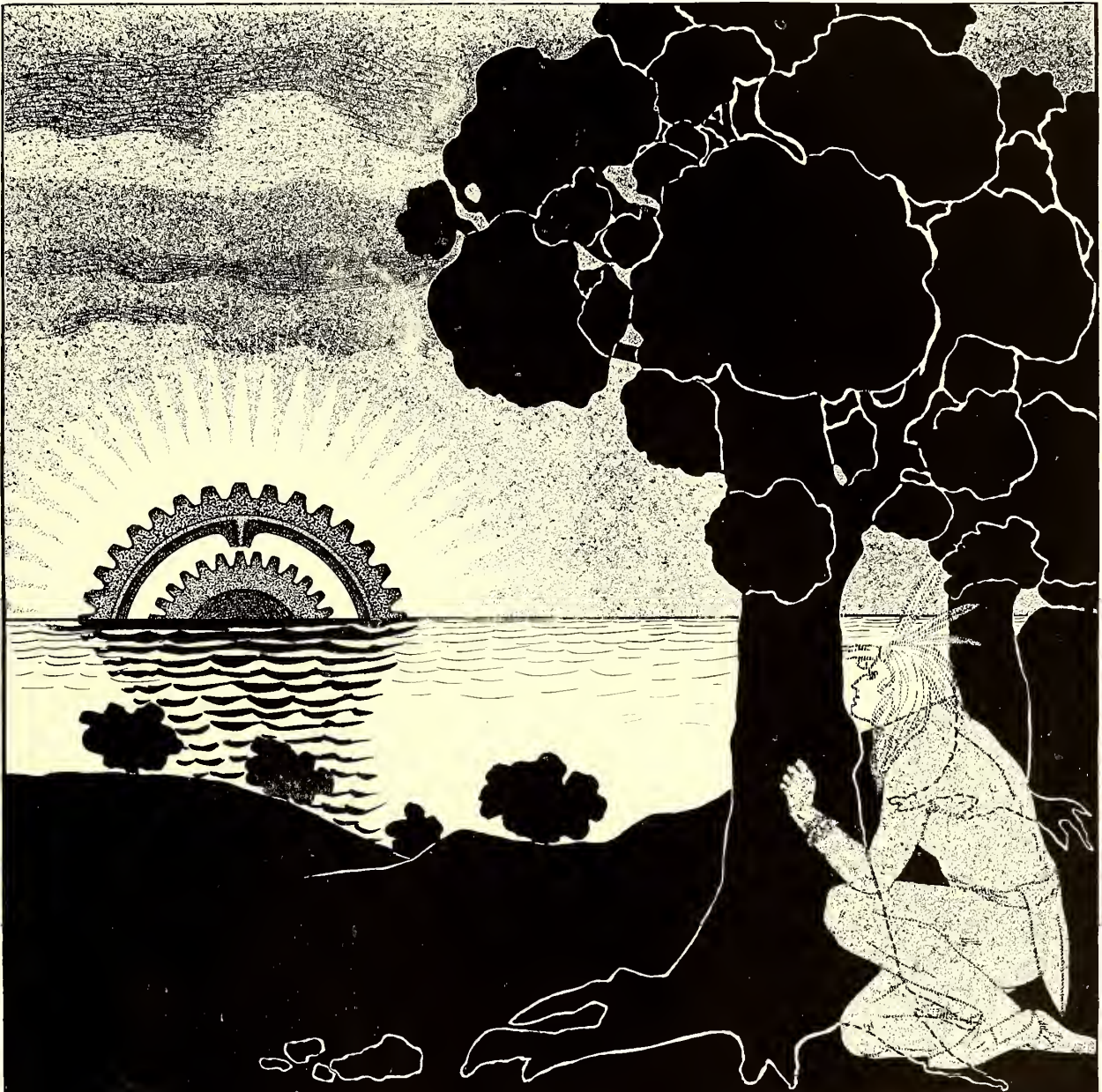
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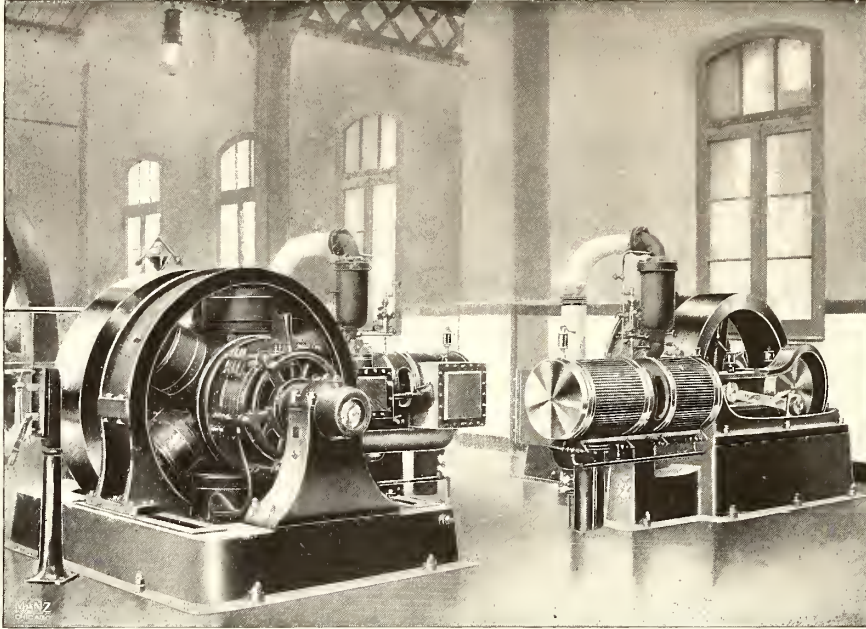
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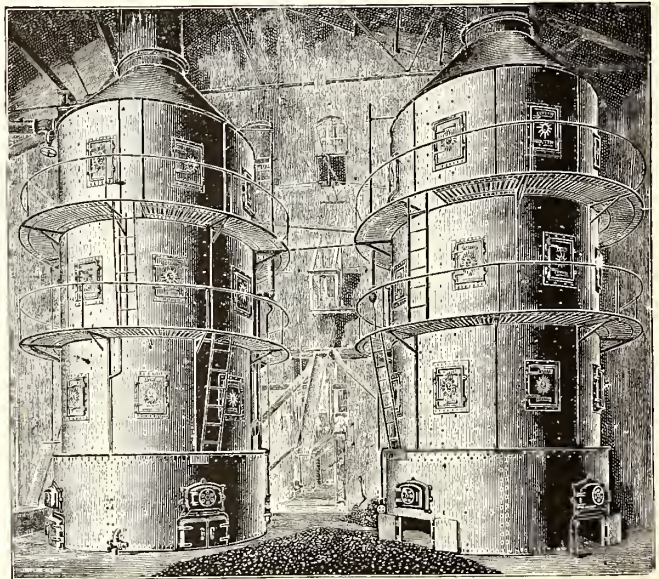
Yours very truly,  
THOS. A. EDISON.

Telegraphic Address, “Heroic Reddish” Telephone, No 47 Heaton Moor

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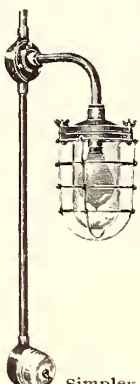
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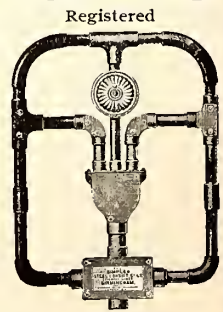
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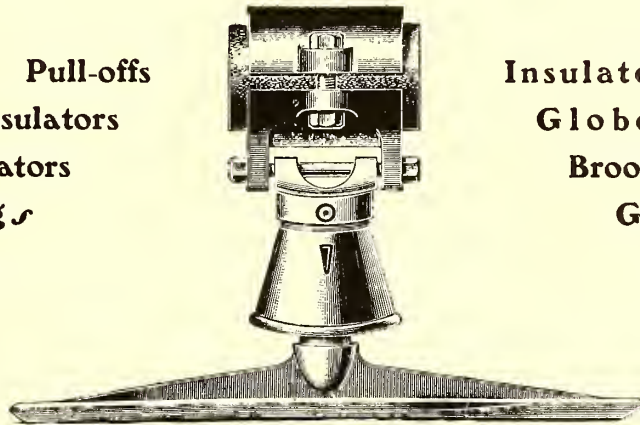


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Insulated Turnbuckles  
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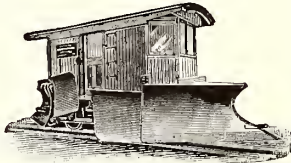
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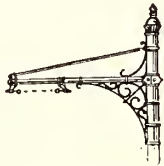
BUREAU PRINCIPAL:  
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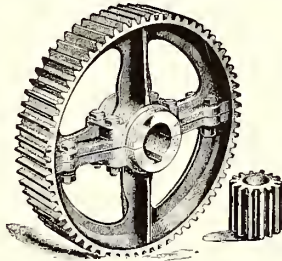
BALAYEUSE À NEIGE

Adresse par Cable: WENMAC

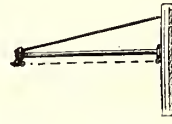
Codes: Lieber et Premier  
(de préférence Code Lieber)



BRAS DE SUPPORT



ENGRENAGE



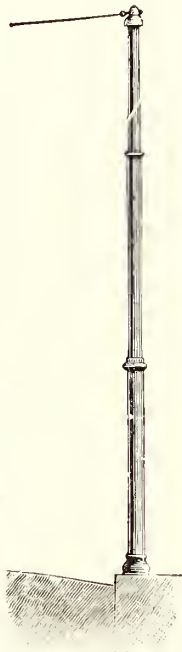
BRAS DE SUPPORT

Trolley Poles and Trolley Wheels

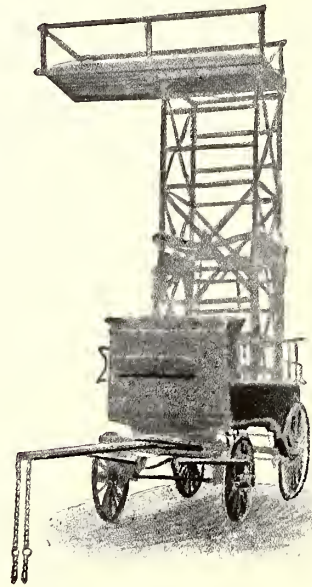
Chase-Shawmut Flexible Rail Bonds

NÉGOCIANTS EN FOURNITURES POUR  
**l'Electricité et  
Chemins de Fer**

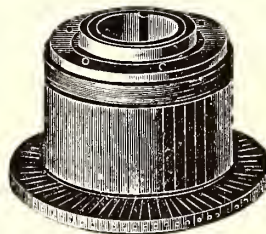
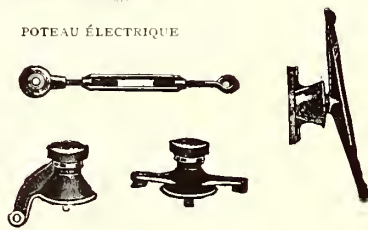
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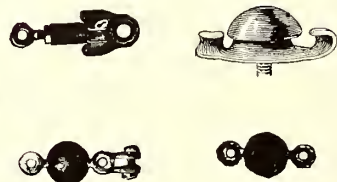
POTEAU ÉLECTRIQUE



VOITURE POUR DIRESSER LES POTEAUX, FAIRE DES RÉPARATIONS, ETC.



COMMUTEUR



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Représentant pour l'Europe

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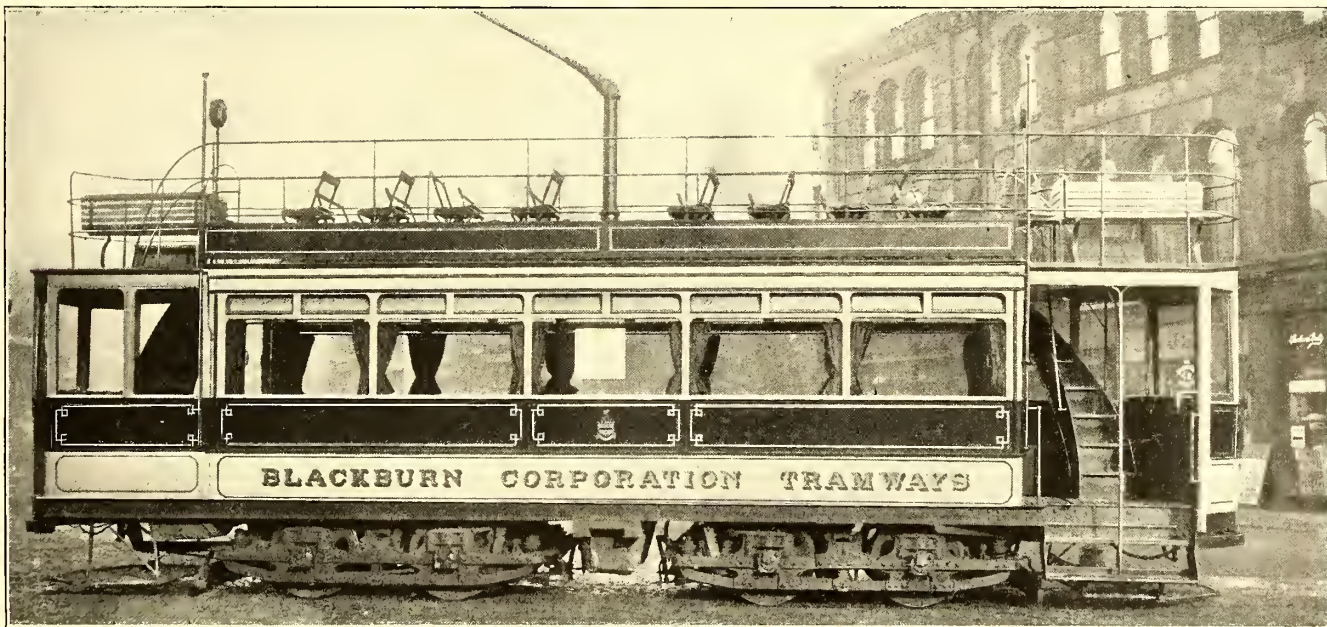
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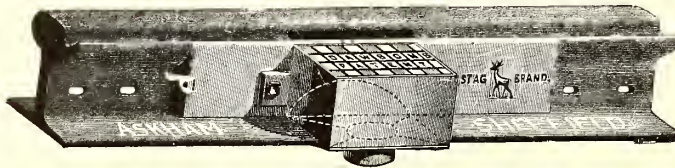
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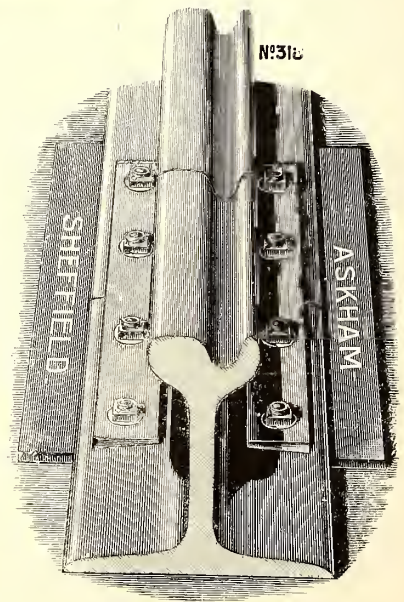


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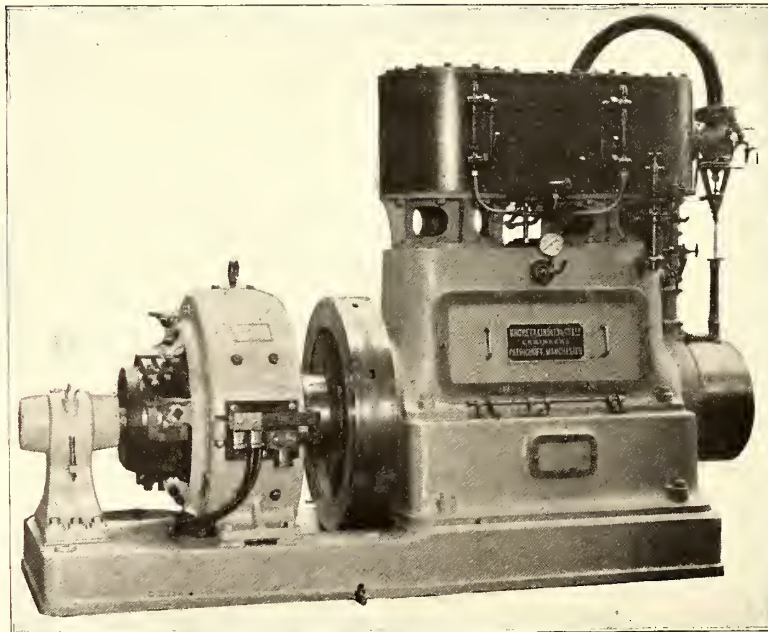
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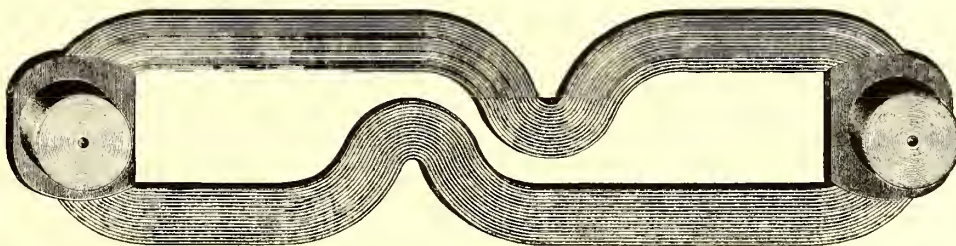
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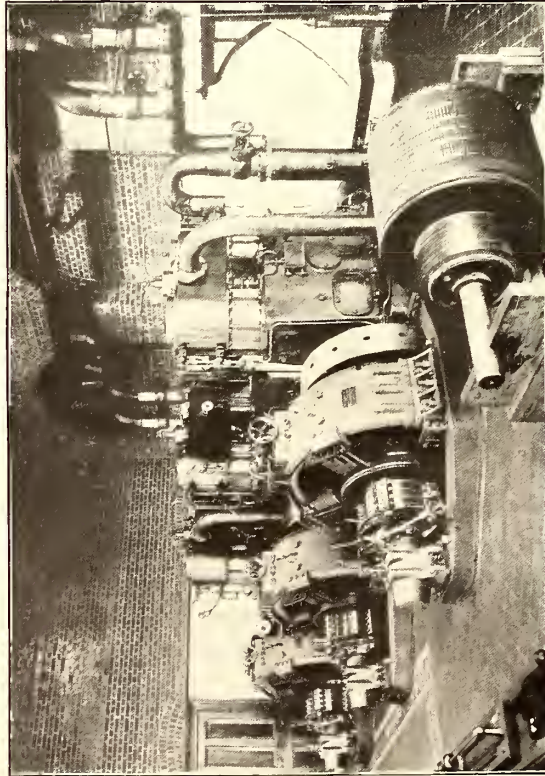
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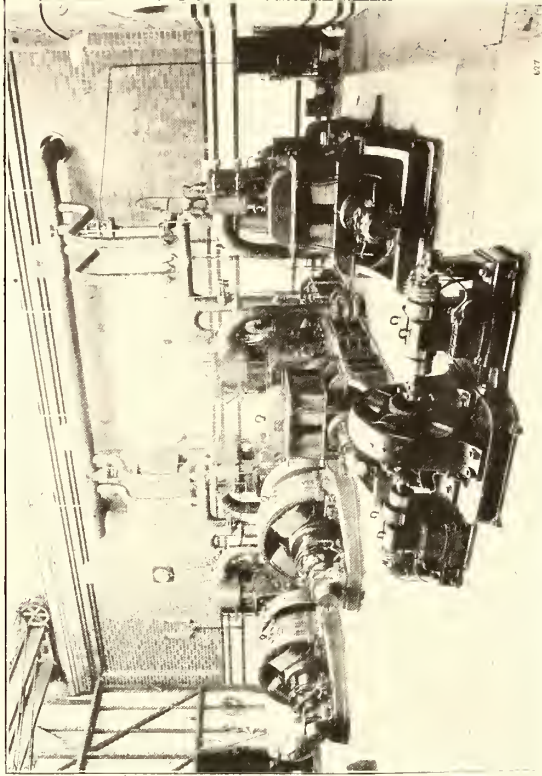
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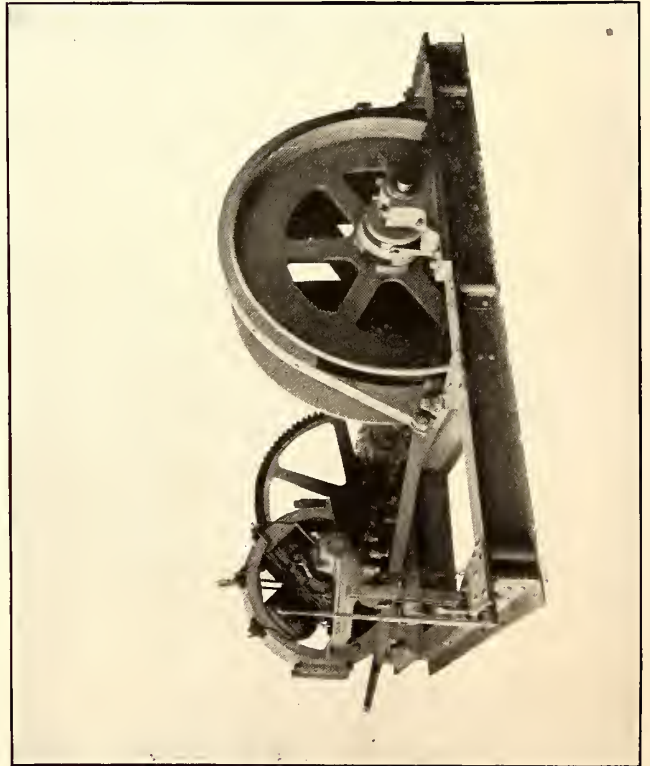
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Haulage Gears  
Locomotives, Coal  
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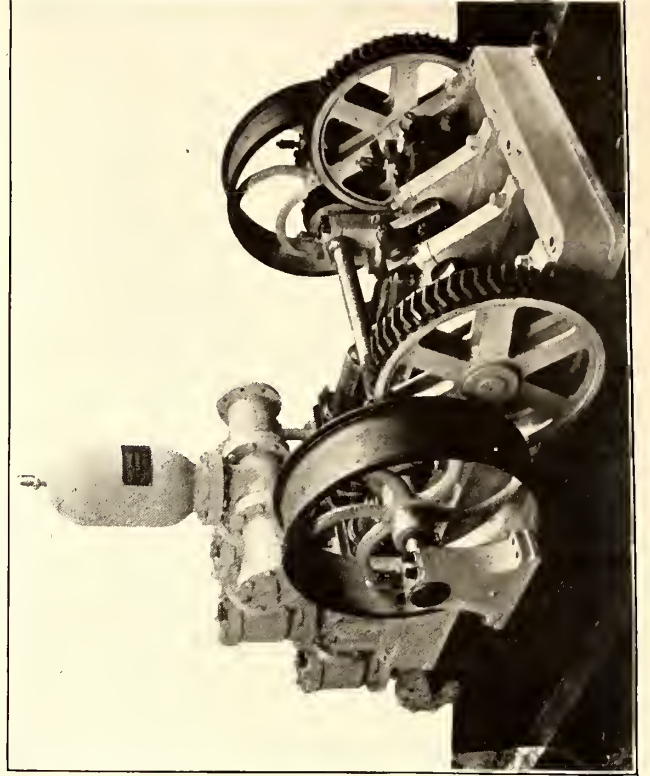
HILL OF HOWTH TRAMWAY POWER STATION



DARLINGTON CORPORATION POWER STATION

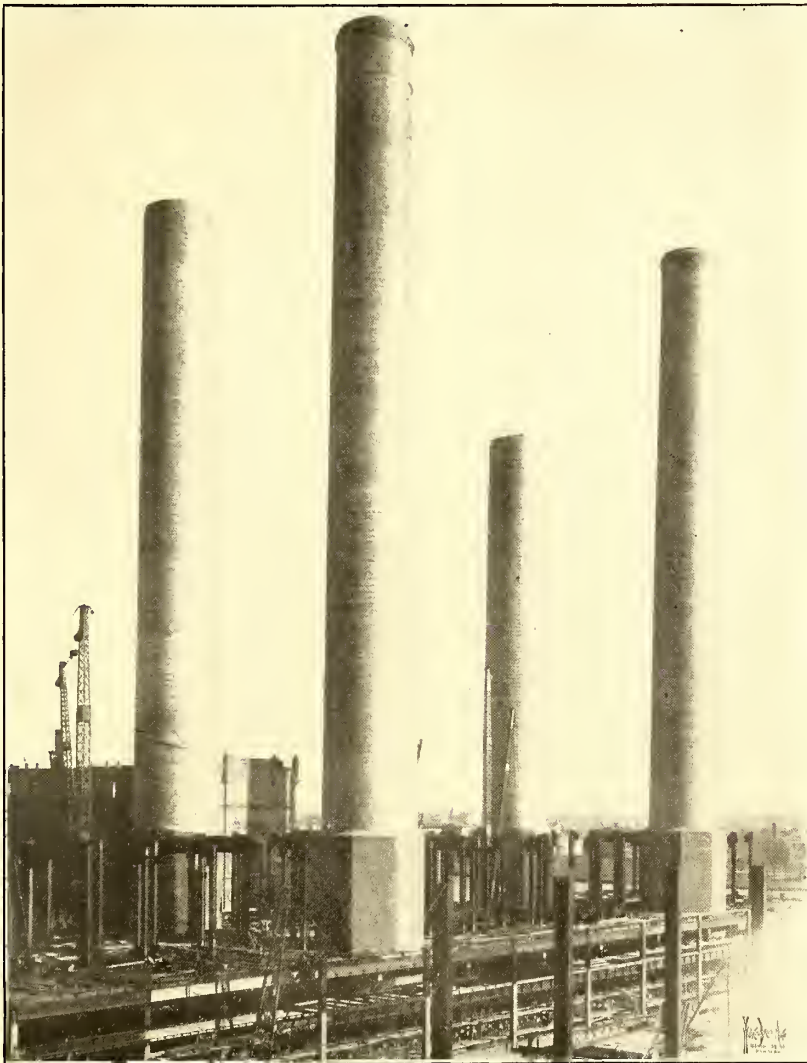


MAIN ROPE HAULAGE GEAR

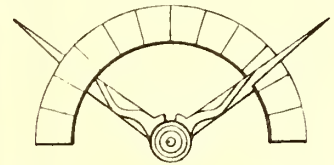


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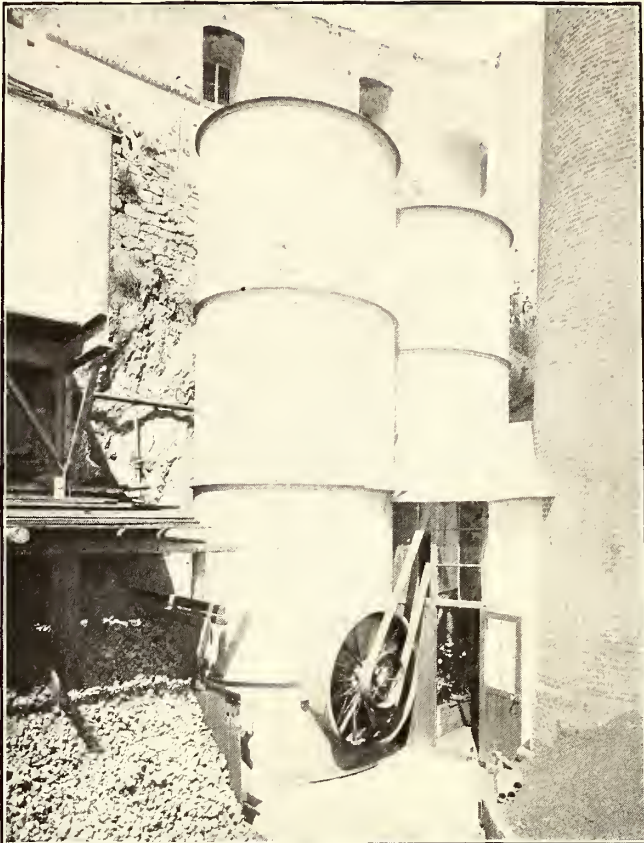
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Small Space Required.

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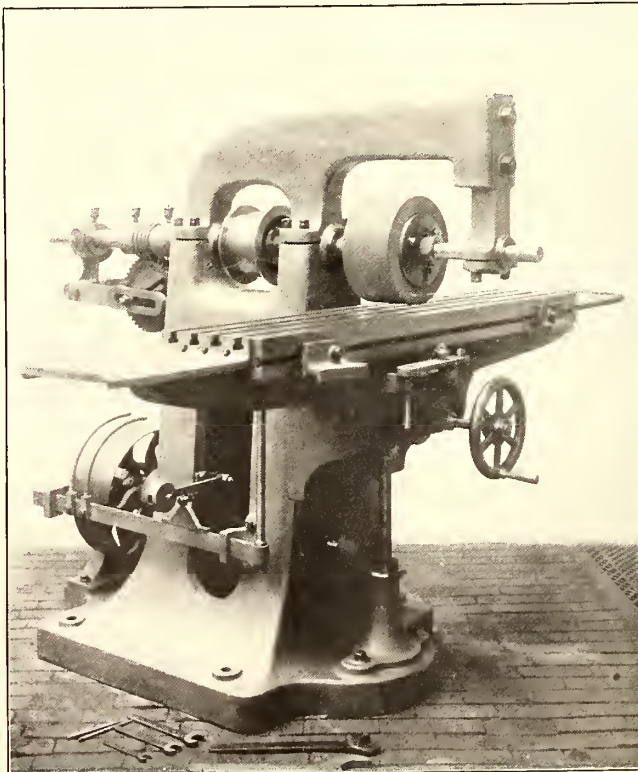
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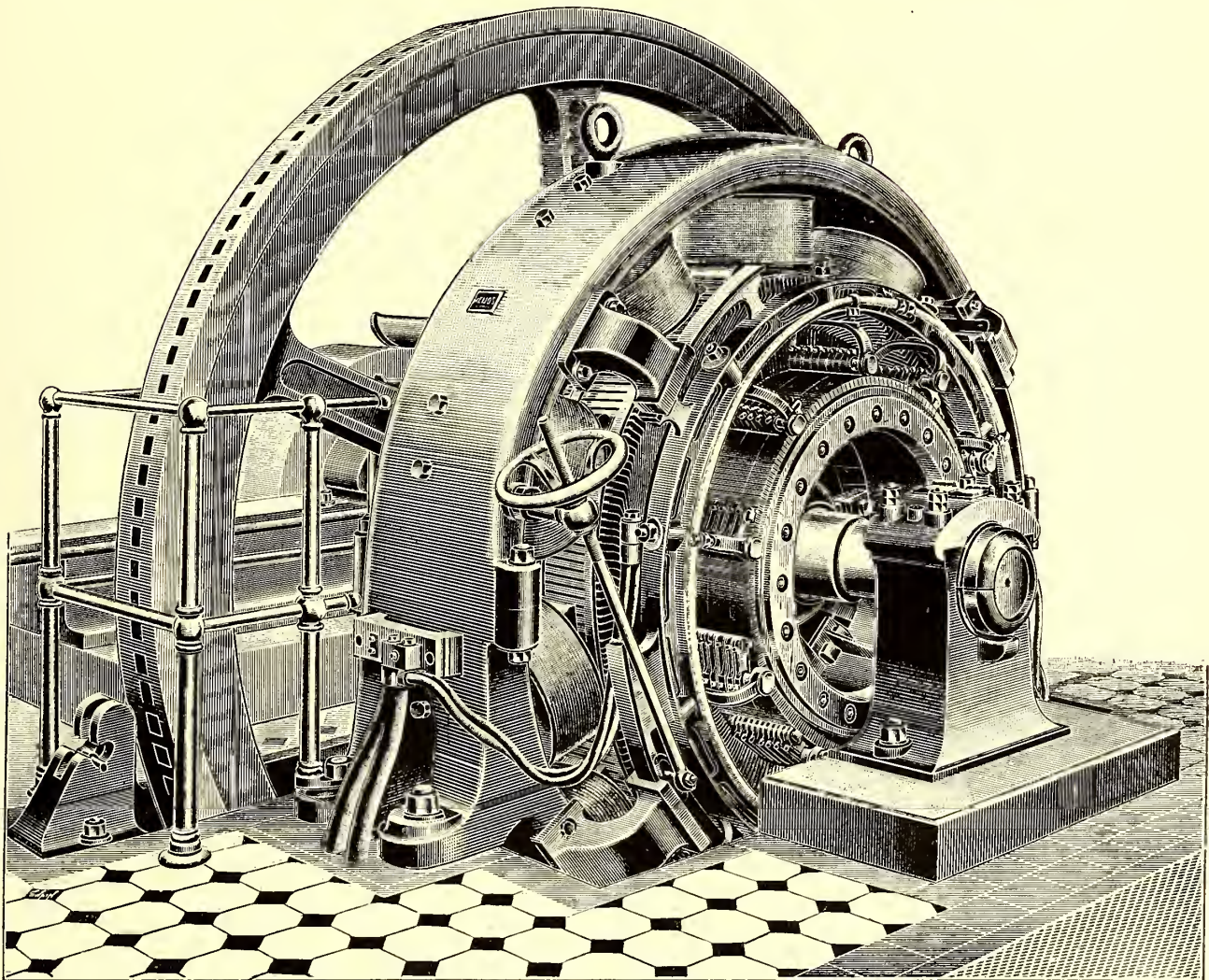
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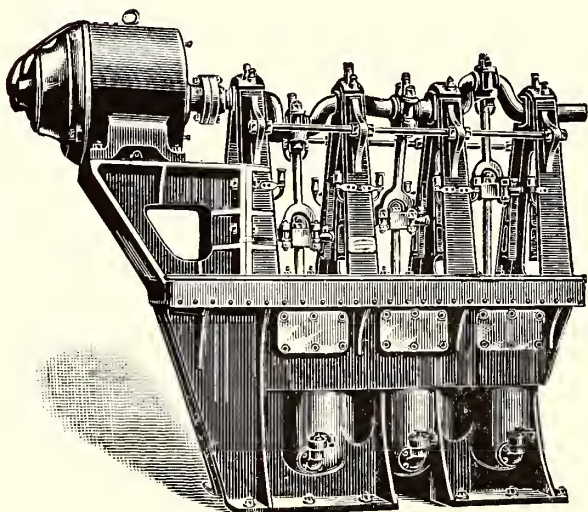
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For Surface, Evaporative, or Jet Condensing Plants

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ALL VALVES READILY ACCESSIBLE.

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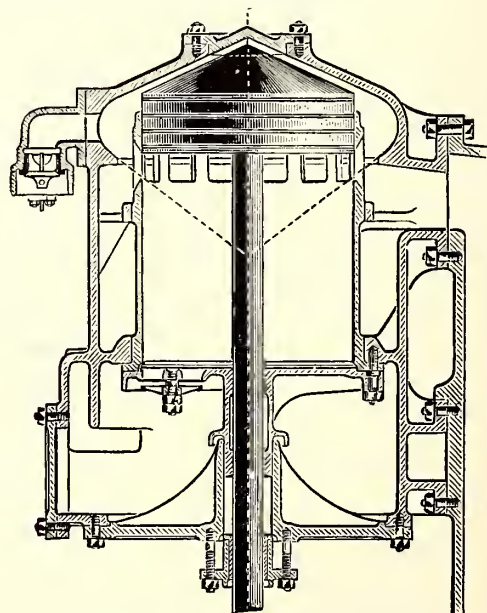
South London Electric Supply.

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|--------------------|------------------------------|
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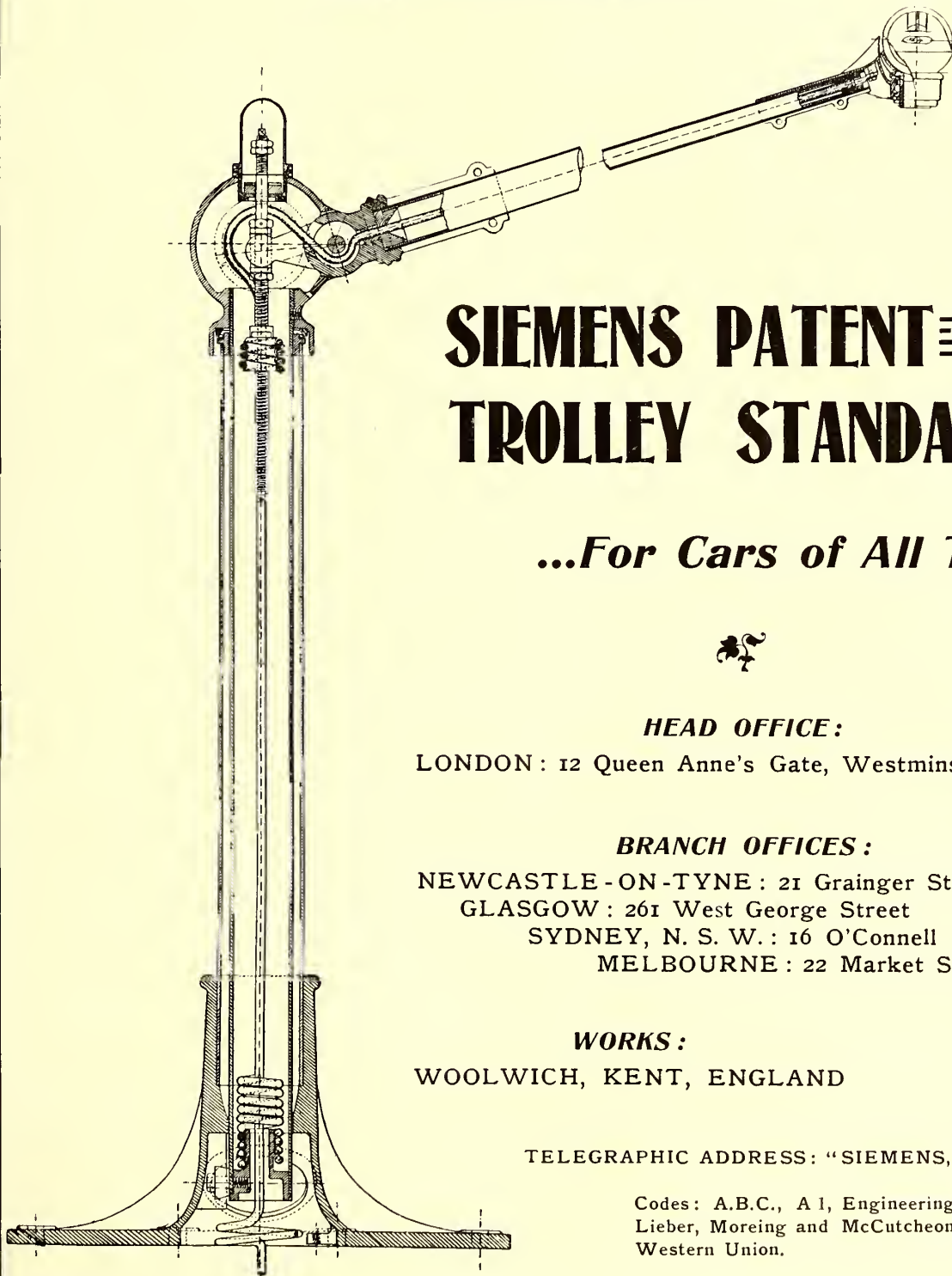
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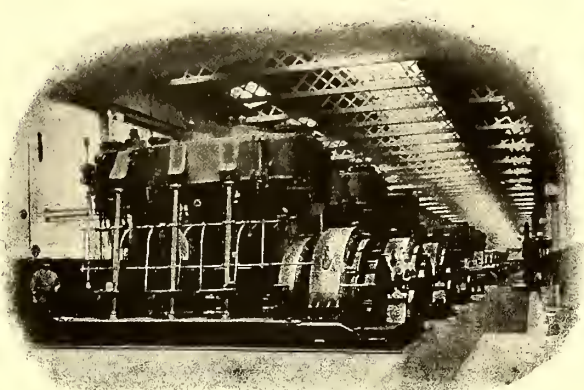
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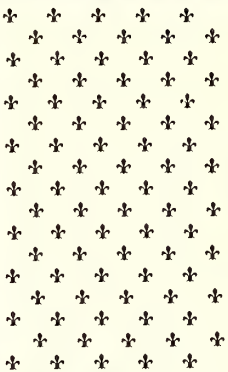
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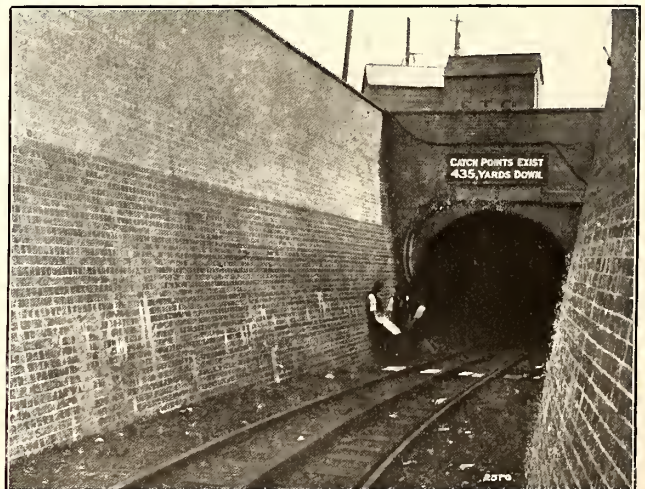
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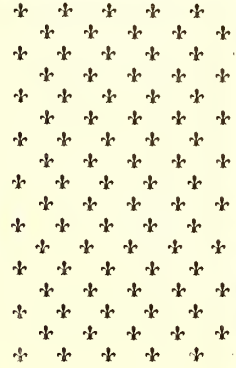
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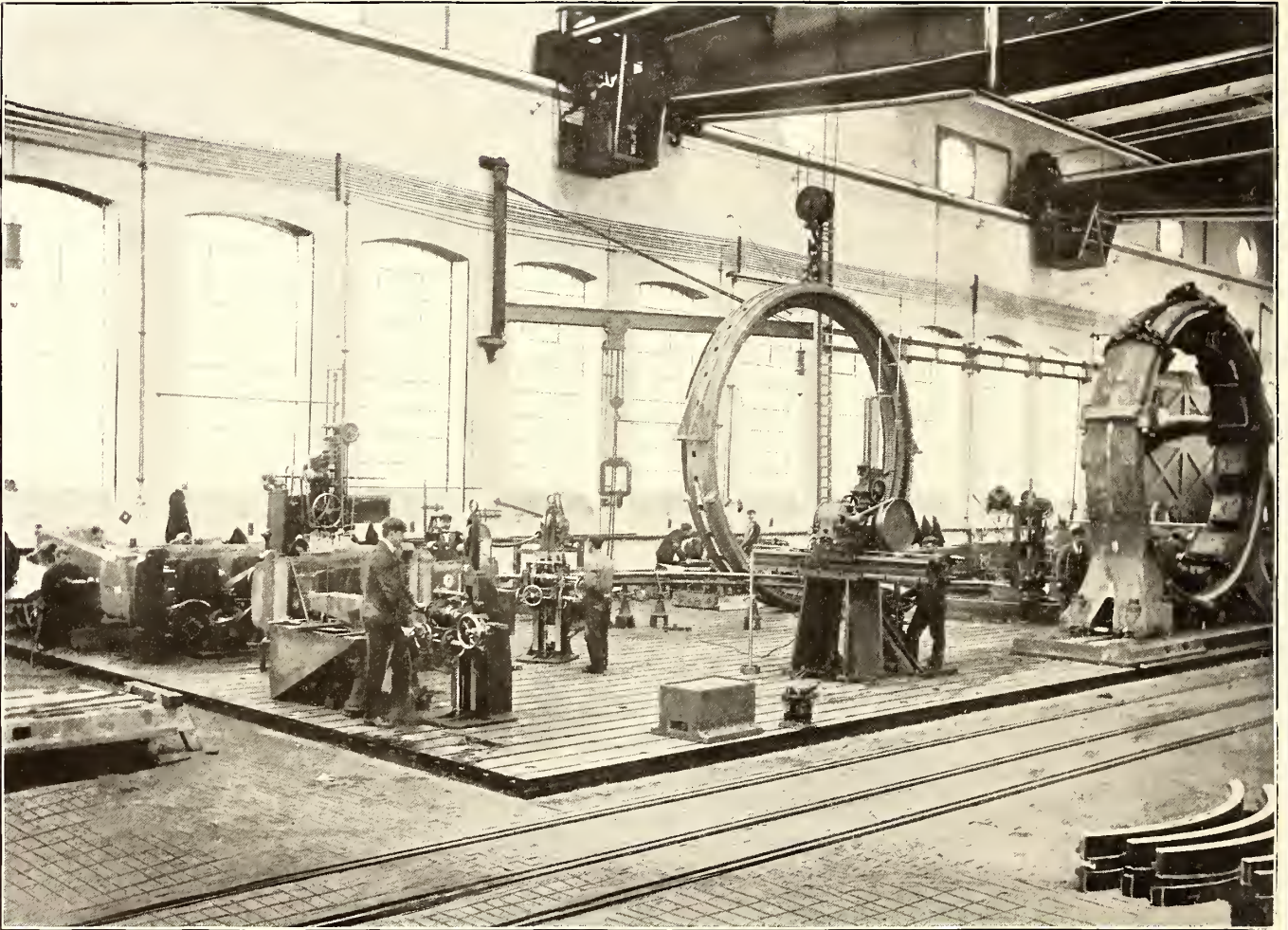
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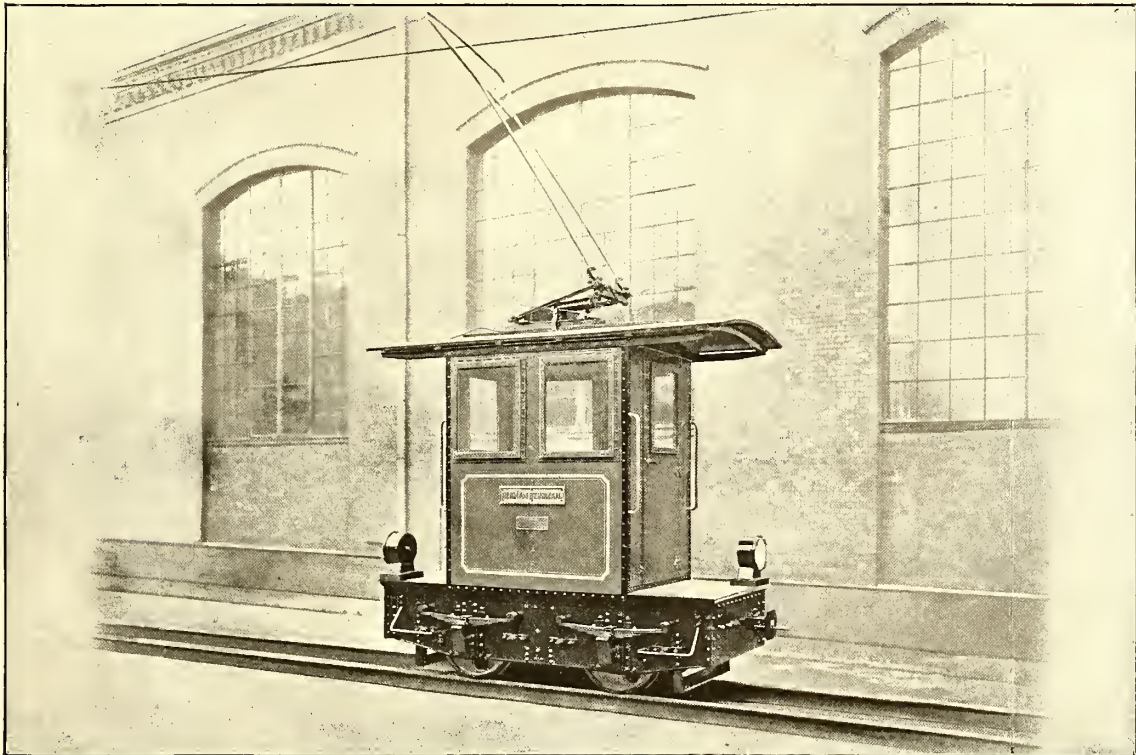
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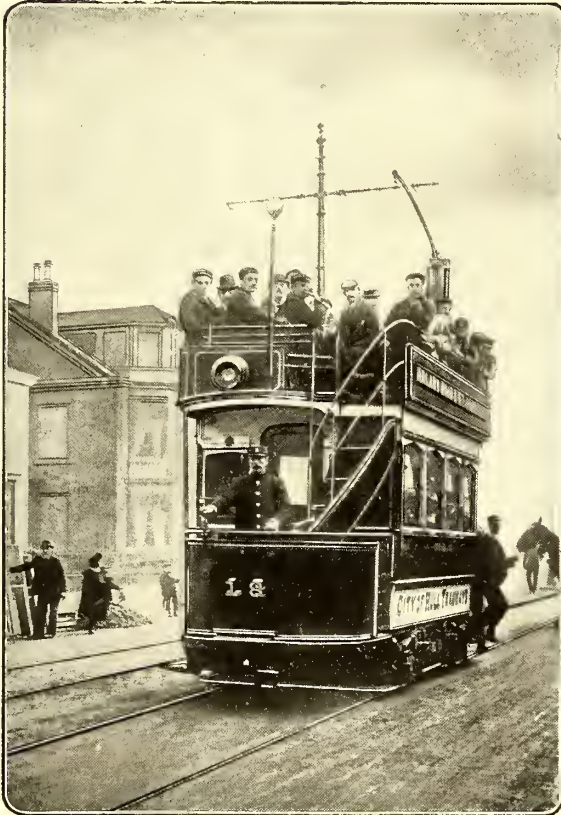
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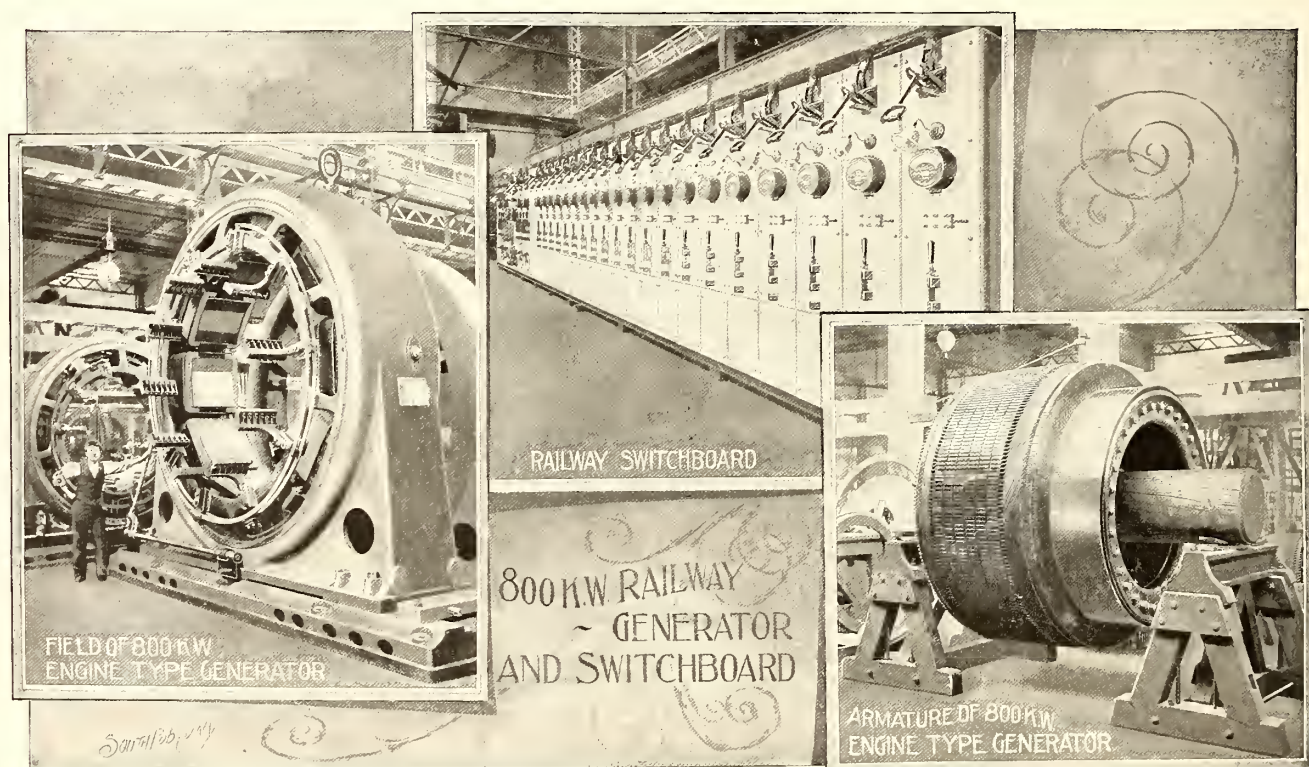
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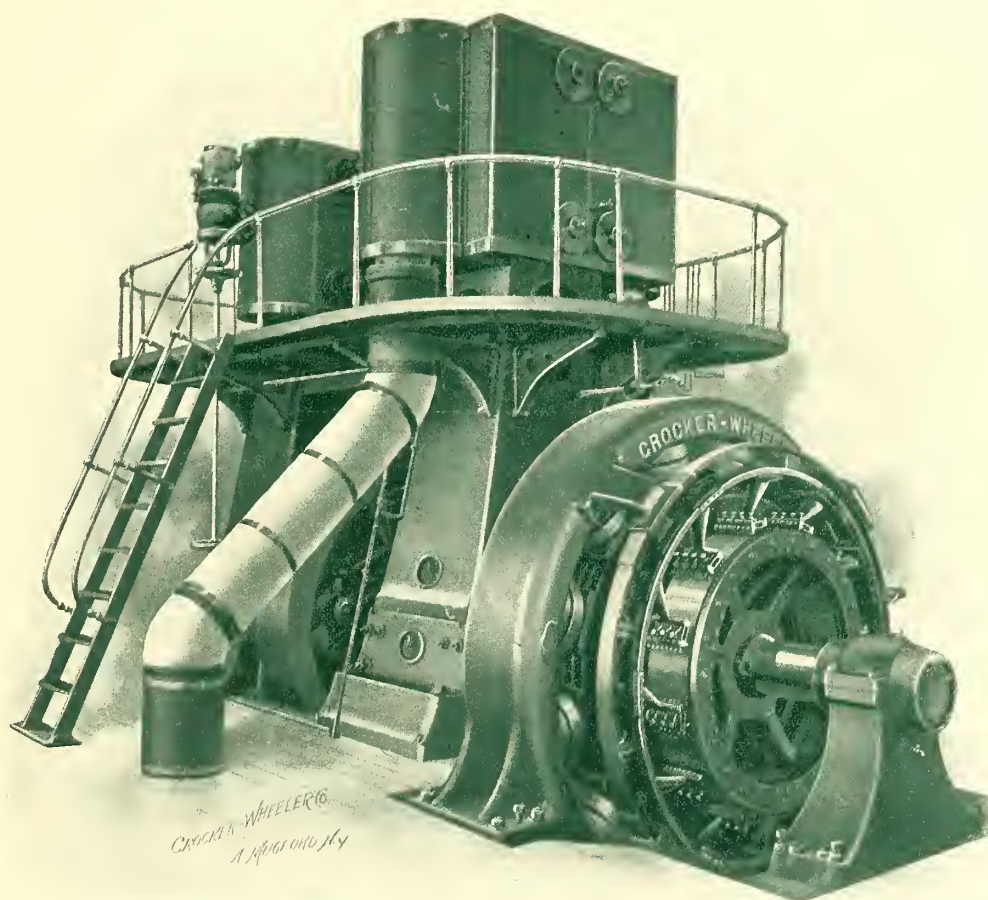
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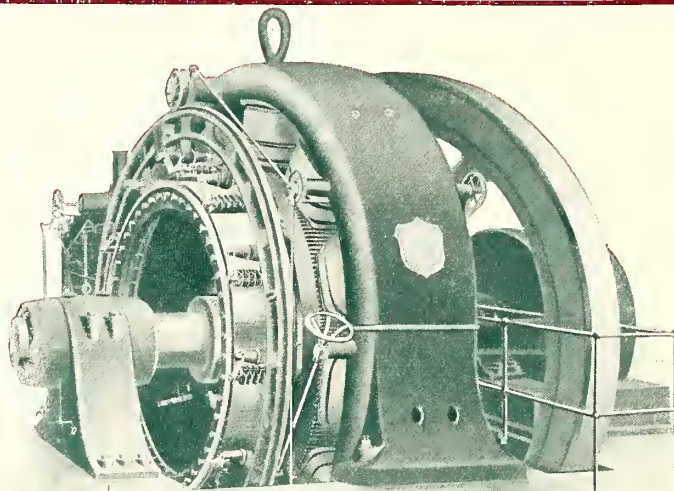
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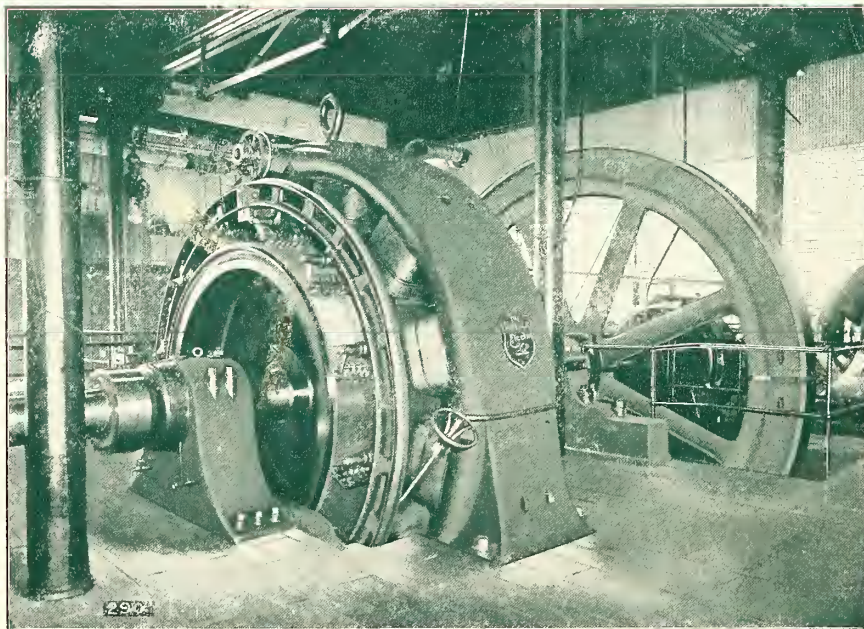
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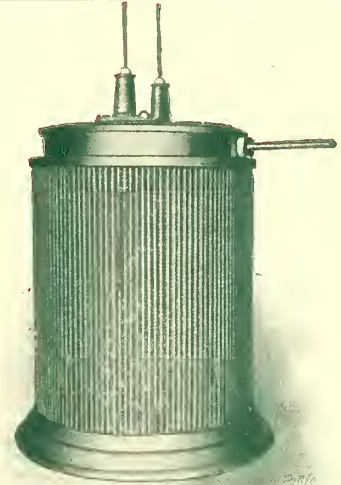
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250 K.W. Wagner Co.'s Transformer, with regulator.

### SALES ORGANIZATION

Wagner Electric Mfg. Co.  
ST. LOUIS, MO.

U. S. A.

Bullock Electric Mfg. Co.  
CINCINNATI.

# COMPRESSED AIR COMPANY

... MANUFACTURERS OF ...

## Air Motors for Street Railways

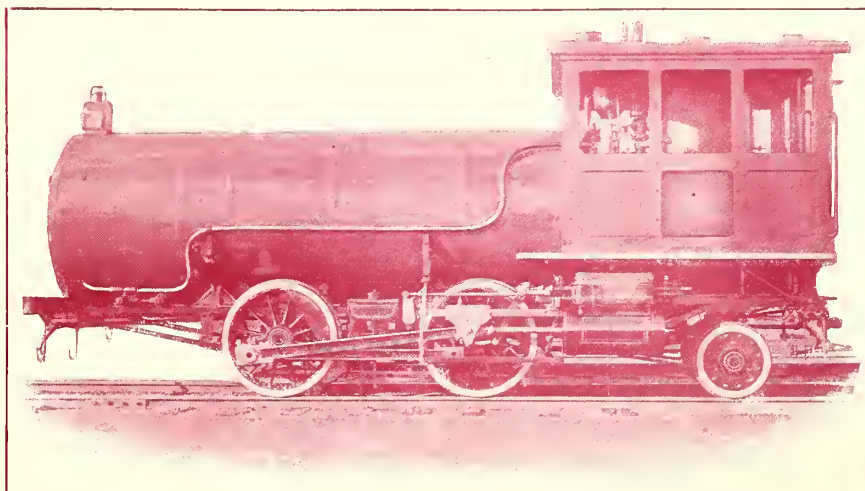
This illustration shows a Compressed Air Motor Car hauling two trail cars on North Clark Street, Chicago.

On some occasions there have been as many as 300 people carried on the three cars on a single trip.

Since this service commenced—May 31st, 1899—there have been no interruptions or breakdowns, and the service has proved to be uniformly satisfactory to the Railroad Company and the public. Motors of this description are now performing the entire street railway service in Rome, New York.



## Locomotives for Suburban Railways



Cylinder, 13 in. x 20 in.

Total weight, 55,000 lbs.

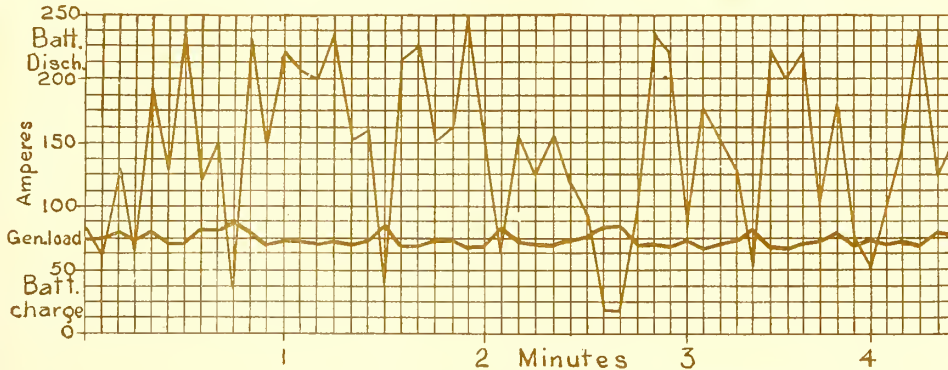
Weight on drivers, 40,000 lbs.

Will haul 150 tons gross load ten miles at a speed of 40 miles per hour.

Drivers, 42 in. diameter

General Offices, 621 Broadway, New York

# Three Lessons in Railway Economy

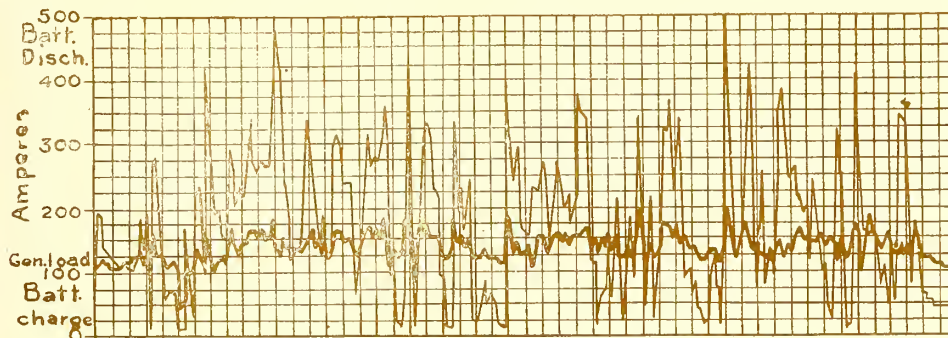


Maximum Load on Line, 250 amperes.

Maximum Load on Generators, 900 amperes.

Maximum Fluctuation above Generator output taken by battery, 160 amperes.

1. A Battery of "Chloride Accumulators" displaces machinery or increases output.

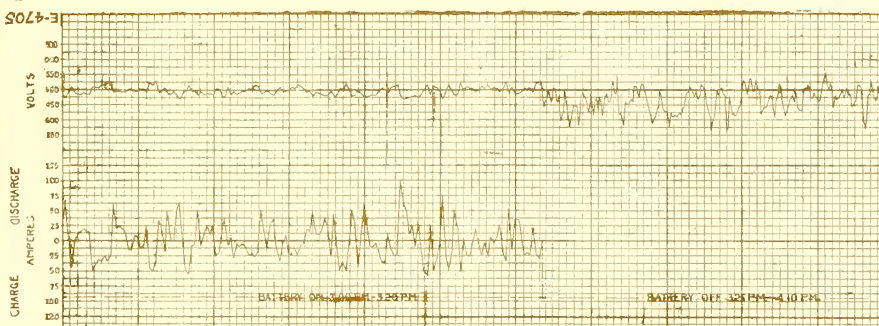


Maximum Load on Line, 500 amperes.

Maximum Load on Generators, 200 amperes.

Maximum Fluctuation above Generator output taken by battery, 300 amperes.

2. A Battery of "Chloride Accumulators" reduces fluctuations on generator.



Minimum Pressure Batteries on 475 volts.

Minimum Pressure Batteries off 375 volts.

3. A Battery of "Chloride Accumulators" floating on the line maintains the pressure at the end of feeders.

A Battery of . . . . "Chloride Accumulators" Acts as a Reserve . .  
in Case of Emergency

Send for Bulletins illustrating the application of Chloride Accumulators to Railway Service

## The Electric Storage Battery Co.

Allegheny Avenue and 19th Street, Philadelphia

Sales Offices :

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Nevada Block

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CHICAGO  
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BALTIMORE  
Equitable Bldg.  
DETROIT  
Michigan Elect. Co.

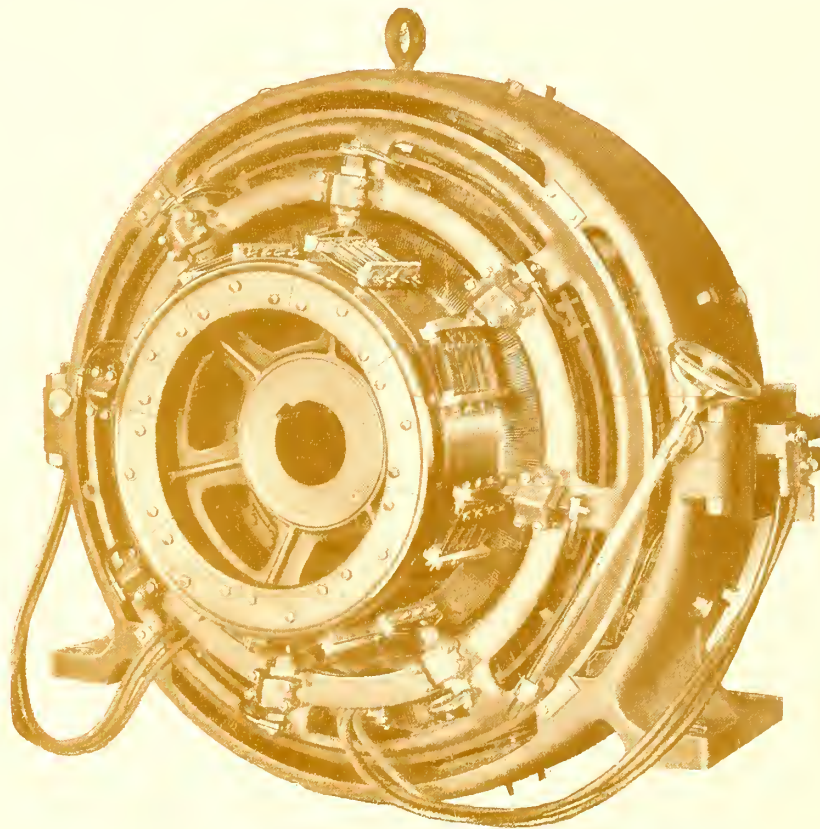
ST. LOUIS  
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# SPRAGUE ELECTRIC COMPANY'S SPLIT-POLE GENERATORS

...FOR...

## LIGHT AND POWER

HIGHEST TYPE OF DYNAMO CONSTRUCTION



Engine Type Split-Pole Generator, 400 K. W.—Front View.

The superior design and construction of the split-pole generators give them an unusually high efficiency and remarkable endurance under the most exacting conditions of service, thereby resulting in the best possible commercial value. They are made in sizes from 25 K. W. to 1,000 K. W. Their advantages are described in detail in Catalogue No. 7100, which will be sent free upon application.

# SPRAGUE ELECTRIC COMPANY

General Offices: 527-531 West 34th Street, New York.

— BRANCH OFFICES —

Chicago:  
Fisher Building.

Boston:  
275 Devonshire Street.

St. Louis:  
Security Building.

Baltimore:  
Maryland Trust Building.

A NEW ERA IN  
ELECTRIC RAILROADING

THE

A PERFECT  
SYSTEM OF CONTROL

MULTIPLE UNIT

...IS THE...

# SPRAGUE SYSTEM

It was invented and named by Frank J. Sprague, and is covered by U. S. fundamental patent No. 660,065. This patent and others pertaining to this system are owned by the

SPRAGUE ELECTRIC COMPANY



It is a method of train operation and control by which any number of motor cars and any number of cars without motors can be combined into trains at will, and operated from any one of as many points as desired through master switches and a controlling line common to all the cars.

Sprague Multiple Unit equipments have been successfully installed on the following roads: Chicago South Side Elevated Railroad, Brooklyn Elevated, Versailles Division of Western Railway of France, and the Boston Elevated Railway, the latter involving the most difficult service in the world.

Sprague apparatus is used in 90 per cent of all existing Multiple Unit operation.

The Sprague Electric Company furnishes the only Multiple Unit controlling apparatus that has passed the experimental stage, has become standardized and has demonstrated beyond question its commercial value by years of practical and successful operation under the most exacting conditions of service, and every emergency arising in practice.

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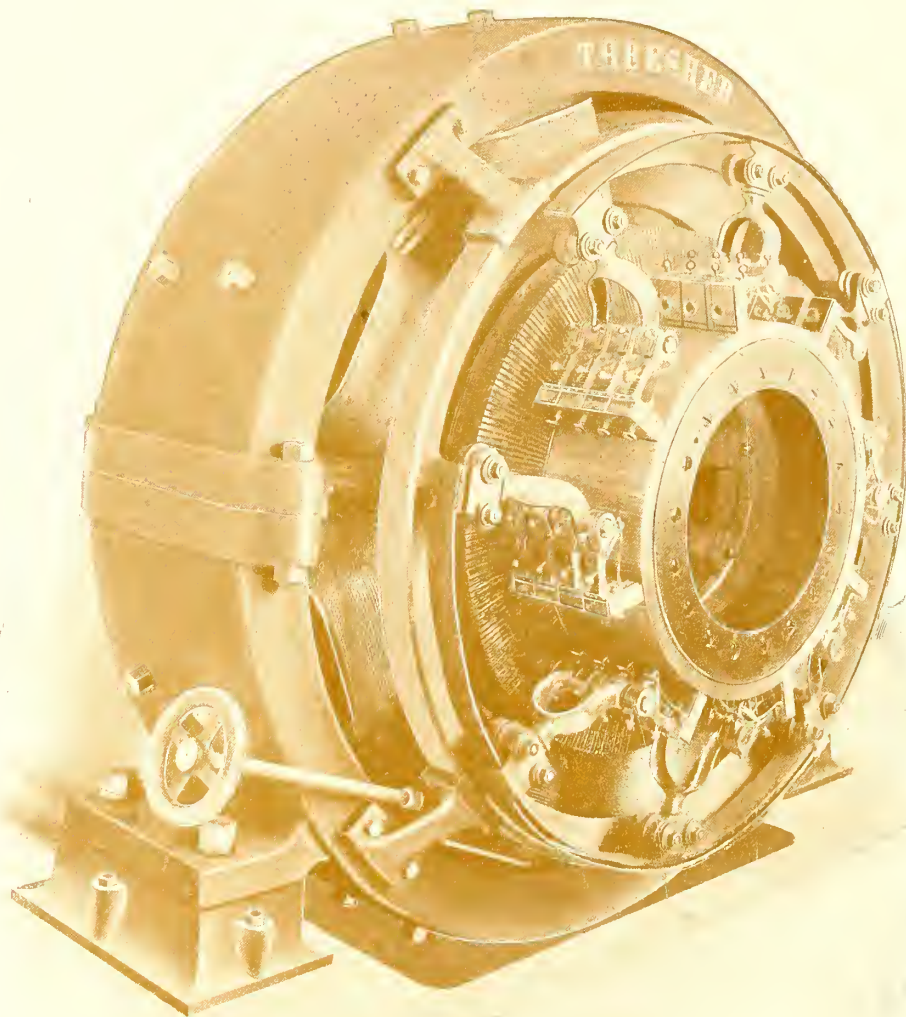
THE PERFECTION OF  
RAILWAY OPERATION

Correspondence  
Invited.

SIMPLE, EFFICIENT  
AND ECONOMICAL

# THRESHER ENGINE TYPE MULTIPOLAR GENERATORS

Possess in largest proportion those . . . characteristics most desired



THRESHER ENGINE TYPE GENERATOR

Complete Equipments for Electric Railways, Lighting and Power Transmission

Manufactured by

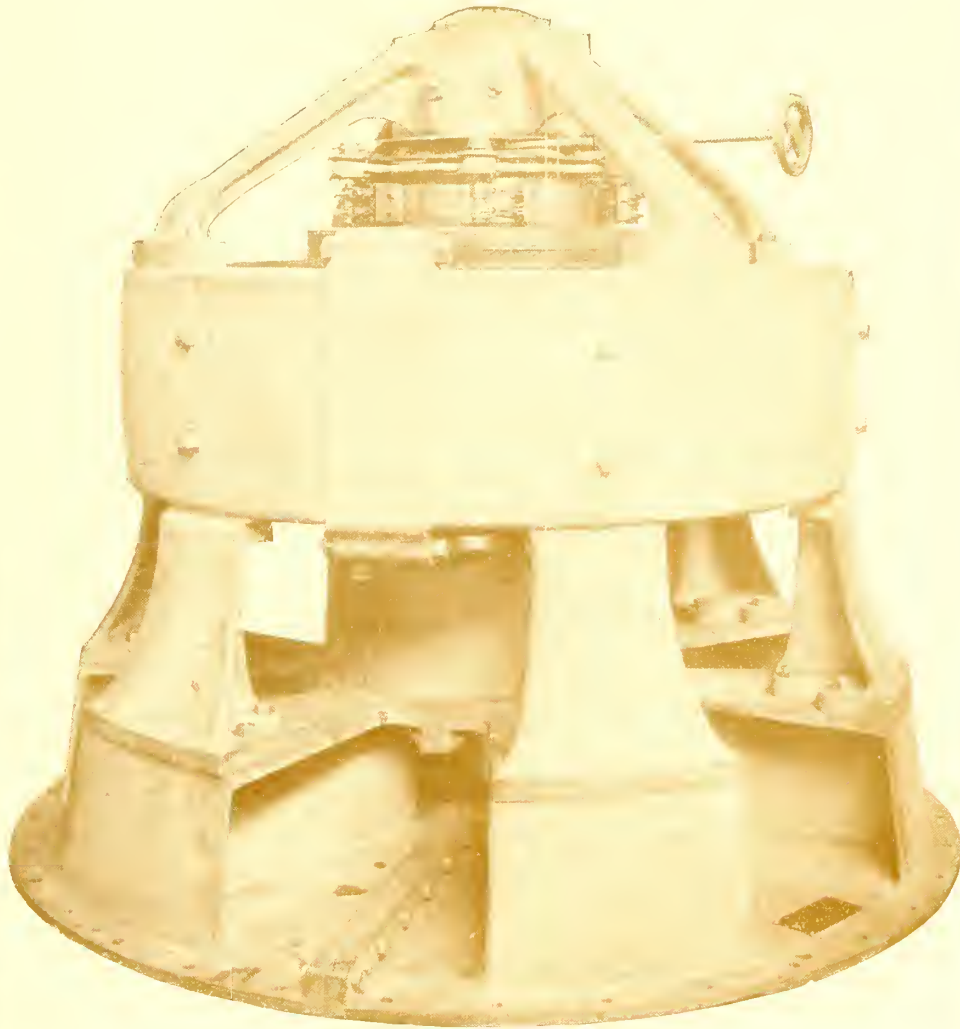
## THE THRESHER ELECTRIC COMPANY

Main Office and Works :  
DAYTON, OHIO, U. S. A.

New York Office :  
120 LIBERTY STREET

# THRESHER

Generators always in the lead  
in economical adaptations for  
.... power transmission ....



VERTICAL TYPE THRESHER GENERATOR MOUNTED DIRECTLY UPON  
CROWN PLATE OF WATER-WHEEL PENSTOCK.

**Thresher Generators and Motors** have been conclusively proved  
to be of the highest efficiency

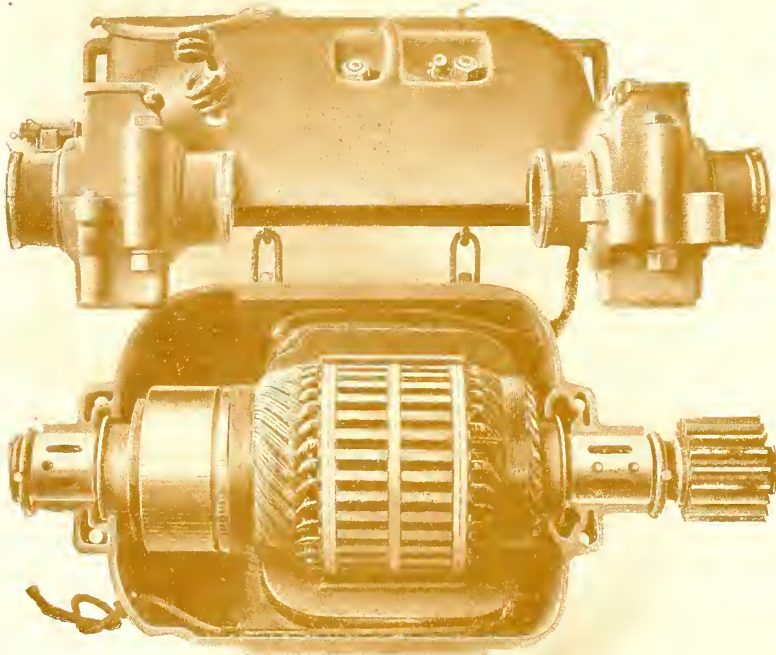
Manufactured by

## THE THRESHER ELECTRIC COMPANY

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# SURFACE AND ELEVATED Railway Motors



No. 34  
50-H.P. MOTOR

Single, Double and  
Quadruple Equipments for  
All Speeds and  
Conditions of Service.  
Simple in Design.  
Extra Large Bearings.  
All Parts Accessible.  
Lowest Cost for Maintenance.

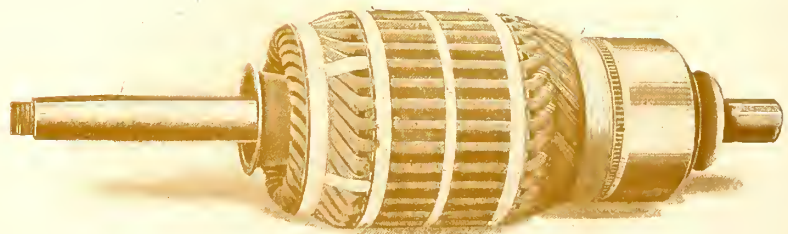
SERIES PARALLEL  
MAGNETIC BLOWOUT

## Controllers

and all Appliances to suit

Ventilated Armature.

Triple  
Armature Coils.



No. 34.  
50-H.P.  
ARMATURE

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LORAIN, OHIO.

SALES OFFICES:

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NEW YORK, Empire Building.

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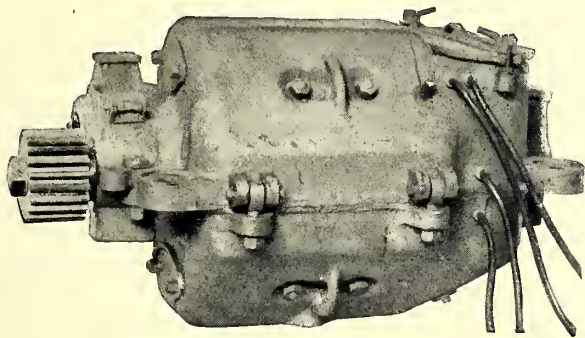
PITTSBURG, Penn Building.



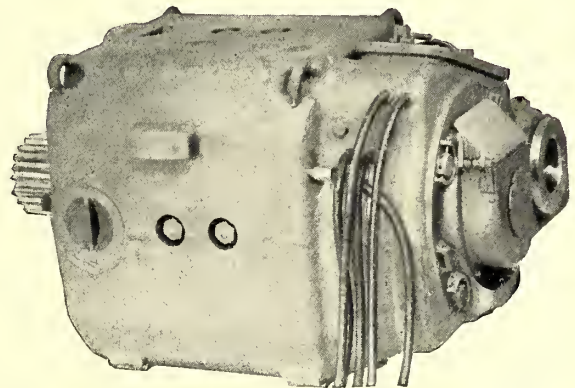
# GENERAL ELECTRIC COMPANY'S

## RAILWAY MOTORS

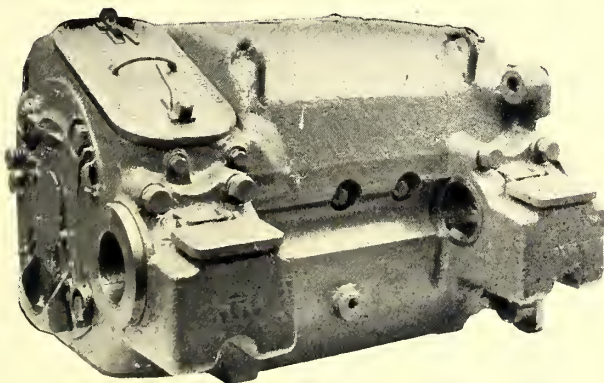
For Heavy Elevated and Suburban High Speed Service



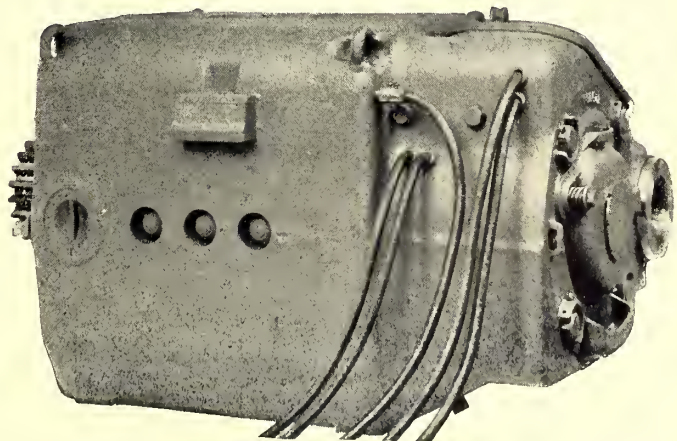
GE-57—50 H.P. Motor



GE-73—75 H.P. Motor



GE-66—125 H.P. Motor



GE-55—160 H.P. Motor

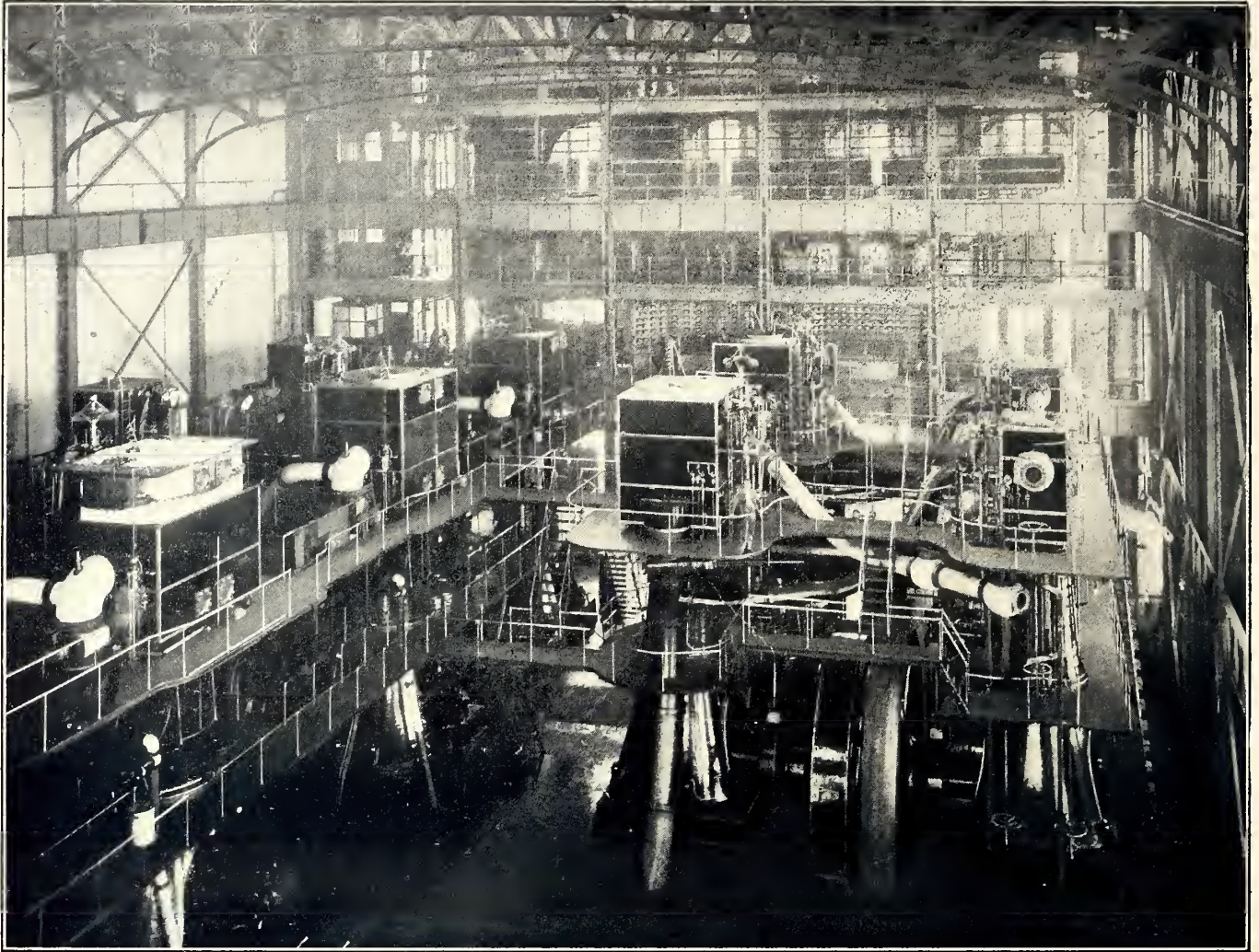
**GENERAL ELECTRIC COMPANY**

Schenectady, N. Y., U. S. A.

# GENERAL ELECTRIC COMPANY

## THE LARGEST ELECTRICAL STATION IN THE WORLD

Eleven Units of 3500 Kw. each at 6600 Volts



Ninety-sixth Street Power Station of the Metropolitan Street Railway Co., New York.

All the Electrical Apparatus in this Station was furnished by

### The General Electric Company

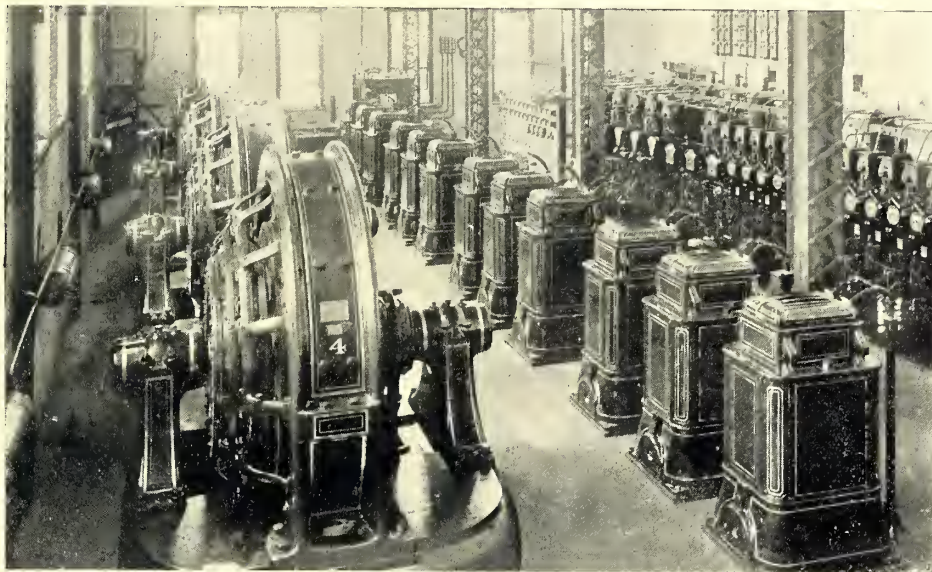
General Office: Schenectady, N. Y., U. S. A.

#### SALES OFFICES

BOSTON, MASS., 200 Summer St.	Pittsburg, Pa., 502 Trademens Bank Bldg.	Columbus, Ohio, 14 N. High St.	Minneapolis, Minn., Phoenix Bldg
NEW YORK, N. Y., 44 Broad St.	ATLANTA, GA., Equitable Bldg.	Nashville, Tenn., Room 73, Cole Bldg.	DENVER, COLO., Kittredge Bldg.
Syracuse, N.Y., Sedgwick, Andrews & Kennedy Bldg.	New Orleans, La., 917 Hennen Bldg.	CHICAGO, ILL., Monadnock Bldg.	Salt Lake City, Utah, Templeton Bldg.
Buffalo, N.Y., Elliott Square Bldg.	CINCINNATI, OHIO, 420 West Fourth St.	Detroit, Mich., 704 Chamber of Commerce Bldg.	SAN FRANCISCO, CAL., Claus Spreckels Bldg.
PHILADELPHIA, PA., 214 South Eleventh St.	Cleveland, Ohio, 310 New England Bldg.	St. Louis, Mo., Wainwright Bldg.	Los Angeles, Cal., Douglas Bldg.
Baltimore, Md., 227 E. German St.		Dallas, Texas, Scollard Bldg.	Portland, Ore., Worcester Bldg.
		Helena, Mont., Electric Bldg.	

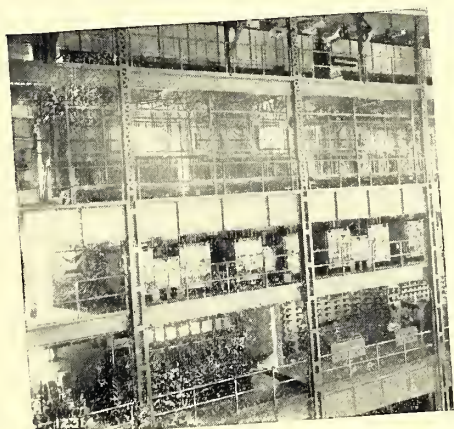
FOREIGN DEPARTMENT: Schenectady, N. Y., and 44 Broad St., New York, N. Y.

# GENERAL ELECTRIC COMPANY

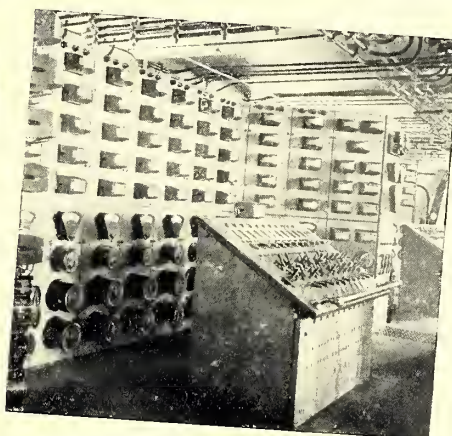


One of the six Substations of the Metropolitan Street Railway Co., showing Rotary Converters of 1,000 Kw each; Air-Blast Transformers; and high and low voltage Switching Apparatus, which were designed, built and installed by

**THE GENERAL ELECTRIC COMPANY**



Switchboards and Oil Switches for controlling 38,500 Kw; rated with overload capacity of 77,000 Kw at 6,600 volts.



Instruments and Controlling Switches for operating Oil Switches of eleven 3,500 Kw Generators.

The oil switches used on this system open automatically on overload and break the full generating capacity of the station with all machines in parallel.

All Switches, Boards and Controlling Apparatus were designed and built by

**THE GENERAL ELECTRIC COMPANY**

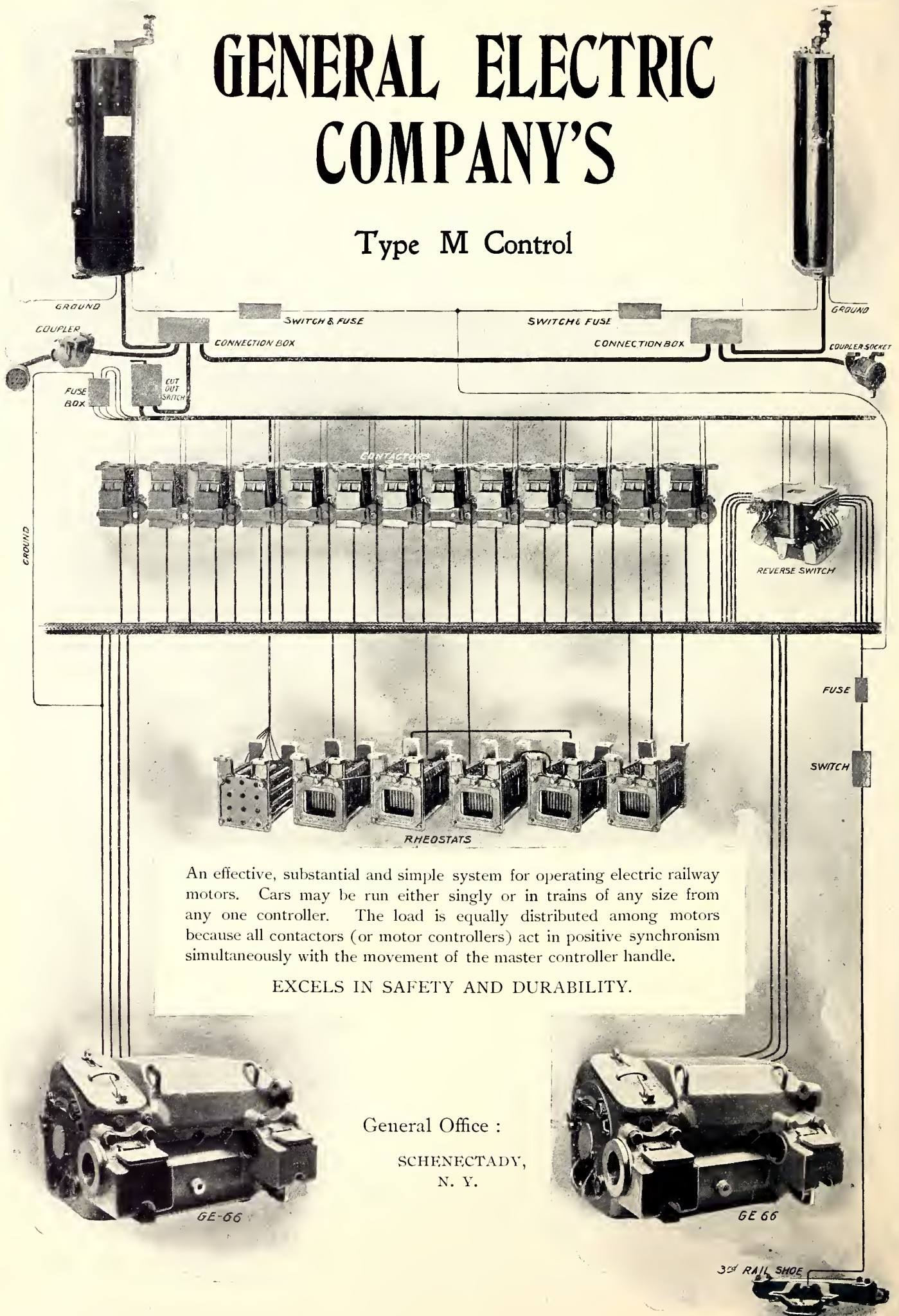


All the Electric Car Equipments purchased by the Metropolitan Street Railway Co. were manufactured by

**THE GENERAL ELECTRIC COMPANY**

# GENERAL ELECTRIC COMPANY'S

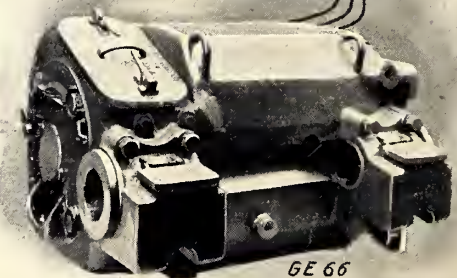
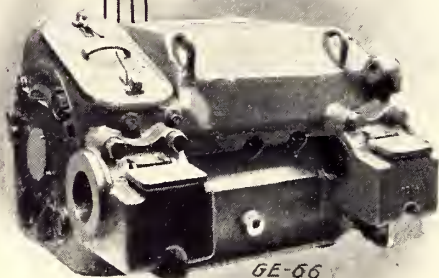
## Type M Control



An effective, substantial and simple system for operating electric railway motors. Cars may be run either singly or in trains of any size from any one controller. The load is equally distributed among motors because all contactors (or motor controllers) act in positive synchronism simultaneously with the movement of the master controller handle.

EXCELS IN SAFETY AND DURABILITY.

General Office :  
SCHENECTADY,  
N. Y.



3<sup>rd</sup> RAIL SHOE

# BISHOP'S

# SPECIAL INSULATIONS

FOR

HIGH TENSIONS  
CENTRAL STATIONS  
UNDER GROUND  
UNDER WATER

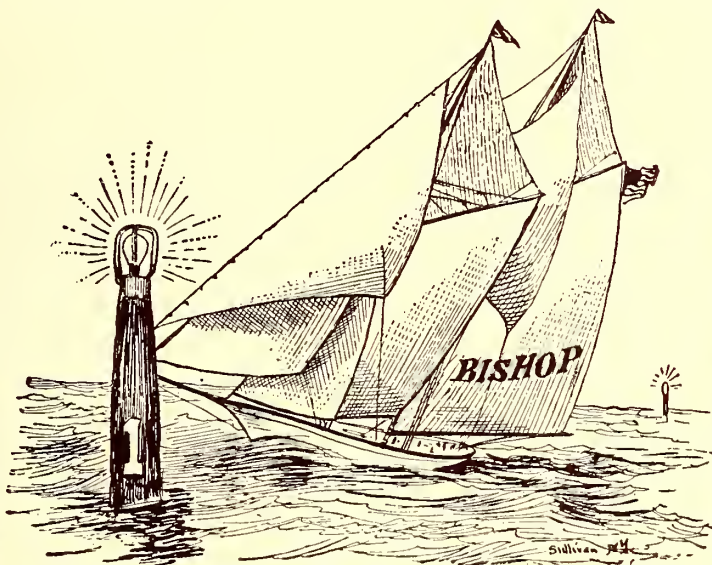


ELEVATOR CABLES  
ELECTRIC CARS  
DRAW BRIDGES  
EVERYTHING GOOD

For those who buy for themselves the best is the cheapest in the end.

### Our Special Car Wires

are made with thin layer of paper between copper and rubber, to keep copper clean and facilitate joint making.



Electric Buoys off Sandy Hook lighted by Bishop Cables.

### THE SAYING

"About the same as Steinway and fifty dollars cheaper," has sold many pianos and caused many life-long regrets.

"About as good as Bishop and will pass the inspector at less cost," is attractive to contractors, but does not insure a good job. It pays to get the best.

When rubber hose and rubber shoes go to pieces in a month or less, it is no wonder that some people hesitate to use rubber insulation on wires, where long life is so important. Our advice is "**Don't Use Rubber**" unless you get the **lasting kind**. A few years since Mr. Alden, in an address before a rubber dealers' convention in Boston, showed by statistics that there was about four times as much rubber used in this country each year as was imported, about three-fourths of the supply being home produced. This is all obtained from old boots, shoes, hose, etc., and is known as reclaimed rubber. It contains all the adulterants used when first made, and is sold at about ten cents per pound. A little new rubber added and a little slicker make cheap shoes and cheap insulation. If you buy cheap rubber shoes or hose, and they don't last, they are easily replaced. If your insulation caves in, the undertaker may get a job, or the insurance company may partially pay damages. Does it pay to take the risk? About the only difference between the **Best White Core**, and the poorest red, white or blue imitations is in the rubber. Slicker and varnish may cause close resemblance, and the crows may be mistaken by the Inspector for ducks, but they don't like water, and won't live long in any of the elements. If you want to be sure of long life for your wires, insist on having only the best, and the surest way of getting the best is to buy of those who don't make or keep low grades. The **Bishop Gutta Percha Co.** does not make second grades of anything. Our sub-marine and underground cables have been in use longer than any others, and speak for themselves. Our wires for inside work are made for long life, rather than cheapness, but are sold as low as any of same quality. **Special Work, Elevator Cables**, and all kinds of flexibles and strands made to order promptly.

# Bishop Gutta=Percha Co.,

420-426 EAST TWENTY-FIFTH STREET, NEW YORK

HARRY D. REED, Superintendent

HENRY A. REED, Manager

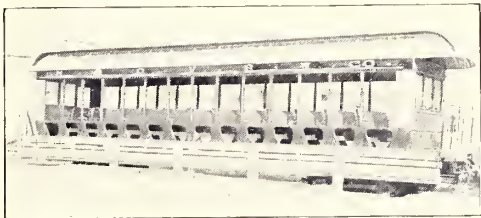
**SECOND HAND EQUIPMENT.**

**CARS**

Consisting of 16, 18 and 20 ft. Closed Cars; 8, 9 and 15 Bench Open Cars, suitable for either 4 ft. 8 1/2 in. or 5 ft. 2 1/2 in. gauge.



Fully repaired and repainted to suit purchaser, equipped and ready for immediate service with W. P. 50 or Westinghouse 3 motors on Peckham or Brill Single trucks, all in good repair.



Four 15-Bench Cars like this cut; three fully wired for 4 50 H. P. motors, on Taylor high speed trucks

NOW ON SALE BY  
**GILES S. ALLISON,** SALES AGENT  
Brooklyn Heights Railway Co.  
57 BROADWAY, - NEW YORK.

**BARGAINS FOR IMMEDIATE DELIVERY.**

We offer for the consideration of buyers, a number of Railway Generators, Tandem and Cross Compound Engines, high speed automatic Corliss and other types.

Also a number of vertical, watertube and horizontal boilers.

A number of cars, single and double truck; also trucks, track material, extra armatures, repairs of all kinds and contractors material.

Correspond with us before buying or selling anything in this line.

WIRE US OR WRITE US FOR FULL INFORMATION.

**THOMPSON, SON & CO.**  
107 LIBERTY STREET, . . . NEW YORK

**FOR SALE CHEAP.**

Any part of fourteen hundred feet of steel elevated railway structure, in first-class condition, suitable for permanent street railway bridges. Full particulars, with blue print, furnished on application.

SIoux CITY TRACTION CO.,  
SIoux CITY, IOWA.

**FOR SALE**

New and Relaying Rails  
New and Second-Hand Motor Cars  
New and Second-Hand Locomotives, Coaches, Box and Flat Cars

JUSTICE COX, JR., & CO., Limited  
552-554 Bullitt Building  
Philadelphia

**FULL EQUIPMENT**

Engines, Boilers, Dynamos, Generators and General Machinery.

Write for special Catalogue.

FRANK TOOMEY  
Phone 261-262. 127-131 N. Third St., Phila., Pa.

**FOR SALE  
Locomotives and Cars**

Freight, passenger and logging locomotives of all descriptions; also freight, passenger and logging cars. Send for description.

F. M. HICKS,  
225 Dearborn St., Chicago.

**Relaying Rails—For Sale.  
Immediate Delivery**

230 Tons 6" Johnson Girder Rails, section No. 62, in good condition, at Washington, D. C. Also other Rails of different weights and descriptions at various points.

BENJAMIN IRON & STEEL CO.  
Buffalo, N. Y.

Our Catalogue of  
**Street Railway and  
Electrical Books**

is yours for the asking.  
STREET RAILWAY JOURNAL,  
120 Liberty St., N. Y.

**PISTONS WANTED**

WANTED—Position as Manager or Superintendent of Electric Railroad, 22 years' experience Steam and Electric Railroad, 17 years of which as superintendent. Thoroughly familiar with all details. Can furnish best of references as to thorough and economical management. Address "J. C. B.," care STREET RAILWAY JOURNAL.

SUPERINTENDENT of construction, now employed, would like position as manager, superintendent or engineer for new electric railway. Responsible for entire construction on line just operating. Competent to deal with franchises, locate, plan, construct, equip and operate. Willing to locate anywhere in the interest of parties desiring a responsible man, and willing to pay accordingly, but prefer Southern States or California. Address, Lock Box 454, Woburn, Mass.

AGENCIES WANTED—The advertiser represents in the South a number of the leading manufacturers of electric railway equipment. Can handle to advantage a few additional lines, both of standard apparatus and specialties. Correspondence solicited from manufacturers desiring a wide-awake Southern representative. Address, "B. F.," care of STREET RAILWAY JOURNAL, New York.

IS YOUR ROAD PAYING DIVIDENDS? If not, perhaps it could be made to do so by improved methods of operation. The advertiser has had 15 years' experience, is now employed as superintendent of a large system and believes he could manage your road to excellent advantage. Can furnish references from men who are recognized as experts in railway management. For further information, address, "RAILWAY MANAGER," care of STREET RAILWAY JOURNAL, New York.

WANTED—Position by a thoroughly competent street railway man of eleven years practical experience, five years as electrician and master mechanic. Can keep repair expense as low as possible, an armature winder and familiar with all types of equipments; moderate salary. Address, "ELECTRICIAN," care of STREET RAILWAY JOURNAL, No. 120 Liberty Street, New York, N. Y.

**WANTED TO BUY**

I am in the market for

**Street Railway or**

**Electric Light Plants**

in any part of the United States.

Address \_\_\_\_\_  
**JOS. B. MAYER,**  
795 Ellicott Sq., - - BUFFALO, N. Y.

4 M. P. 4-300-400 G. E. RAILWAY GENERATORS.  
3 M. P. 4-100-650 G. E. " "

In Excellent Condition. Immediate Shipment.

**ROSSITER, MACGOVERN & CO.**

Principal Offices 141 BROADWAY, N. Y. Works JERSEY CITY, N. J.

**CHARLES E. DUSTIN CO., 11 BROADWAY, N. Y.**

I beg to notify my friends and acquaintances that I have terminated my connection with ROSSITER, MACGOVERN & Co., as President and General Manager, in order to organize the CHARLES E. DUSTIN COMPANY.

The new company has secured offices at 11 Broadway, New York City, and proposes to engage in the purchase and sale of all kinds of Electrical Machinery, Engines, Boilers, etc., and also to undertake the construction of Electric and Steam Plants and to do General Engineering.

Mr. W. S. Barstow, formerly General Manager of the Edison Electric Illuminating Company of Brooklyn, has been retained as Consulting Engineer, and will devote a large part of his time to the interests of the new concern. The company will have a capital of \$250,000 and will be fully prepared to cover all special branches of the business as above set forth.

With the thanks for past courtesies, and trusting that in the CHARLES E. DUSTIN COMPANY I may have the pleasure of continuing business relations with you, I remain, very respectfully yours,

CHARLES E. DUSTIN,

September 17, 1901

Bowling Green Bldg., 11 Broadway, New York

**CHARLES E. DUSTIN CO., 11 BROADWAY, N. Y.**

FOR SALE

**STEEL RAILS** All Weights

Track Fastenings and Spikes  
For Prompt Delivery . . . . .

Relaying and Scrap Rails Bought and Sold.

**The Steel Rail Supply Company**

100 Broadway,

New York City

Successors to  
HUMPHREYS & SAYCE

**WANTED**

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**Street Railway Journal**

LIST FURNISHED ON APPLICATION

**Street Railway Publishing Company**

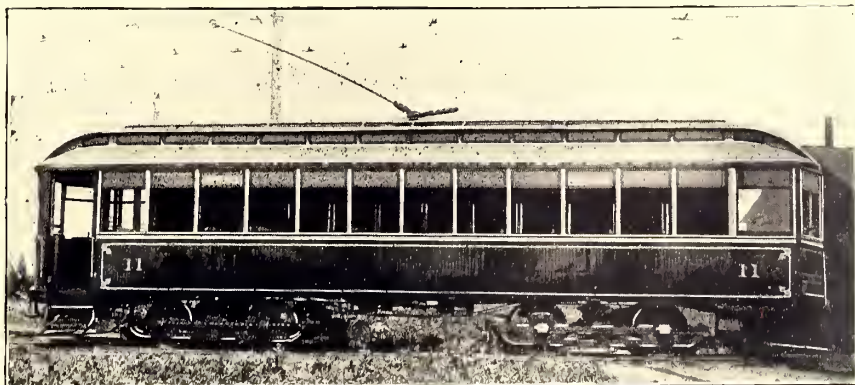
120 LIBERTY ST., NEW YORK

**A BARGAIN—CARS AS GOOD AS NEW—TALK QUICK**

JEWETT CAR BODIES, MOUNTED ON PECKHAM No. 14a EXTRA STRONG TRUCKS, EQUIPPED WITH TWO 50 H. P. WALKER MOTORS.

LACLEDE CAR BODIES, MOUNTED ON CURTIS TRUCKS, EQUIPPED WITH FOUR WESTINGHOUSE No. 49 MOTORS.

**Western Electrical Supply Co.** ST. LOUIS U. S. A.

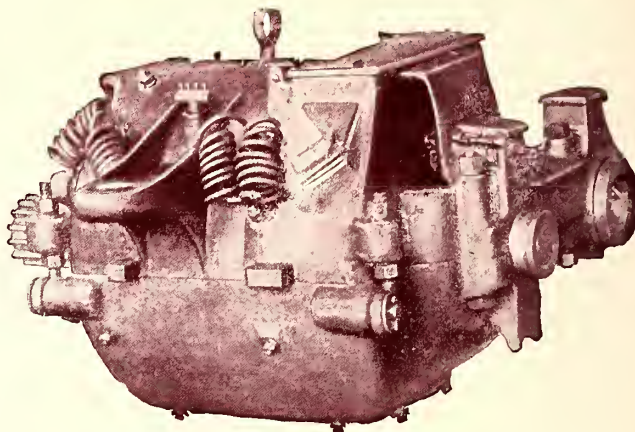


**For Sale** We are in the Market to Buy or to Sell   
 Open and Closed Cars, Motors, Generators, Relaying Rails, Etc.

**CARS—QUICK DELIVERY—BARGAINS—MOTORS**



Various Styles.



We can supply equipments :

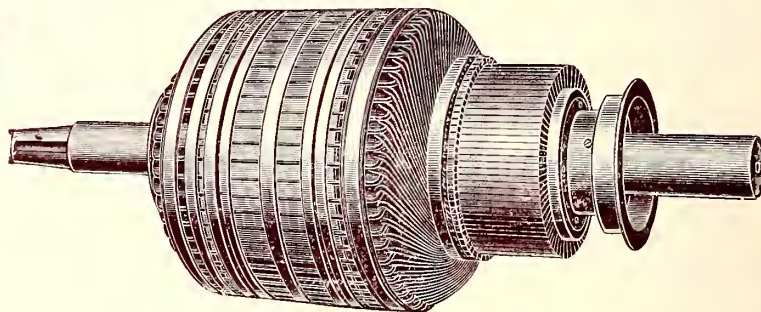
- Westinghouse 3
- “ 12A
- “ 38B
- G. E. 800
- “ 1200

See sample motors in our exhibit at Street Railway Convention.



Some choice equipments of Westinghouse No extra cores, armatures and shells.

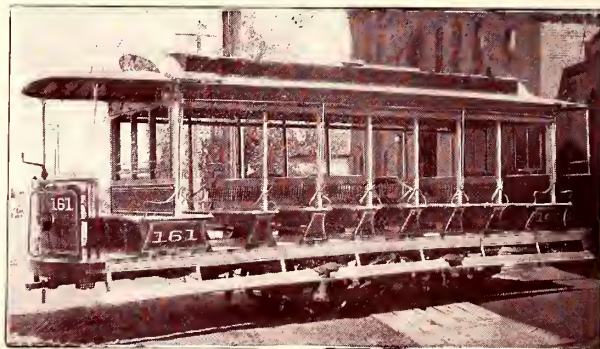
All our motors in first-class running order.  
 Some equal to new.



Extra Armatures



We have some PECKHAM Single Trucks.  
 Also 16-ft. Closed Cars, Stephenson.



Prepare for next Summer.

**WHAT HAVE YOU FOR SALE**

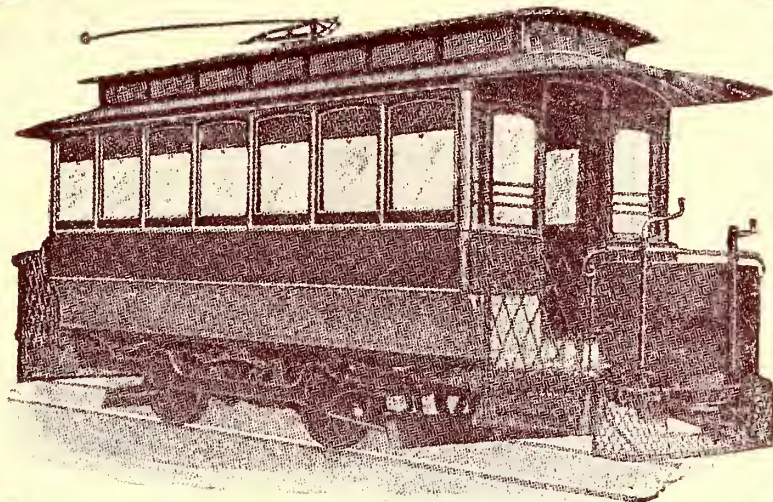
**DALLETT & COMPANY**

201 WALNUT PLACE, PHILADELPHIA.

Established 1875.

Long Distance Telephone.





30 SINGLE TRUCK ST. LOUIS CARS, COMPLETE.

# ELECTRICAL & STEAM MACHINERY

OF ALL FIRST-CLASS MAKERS  
FOR RAILWAY, LIGHTING, & POWER

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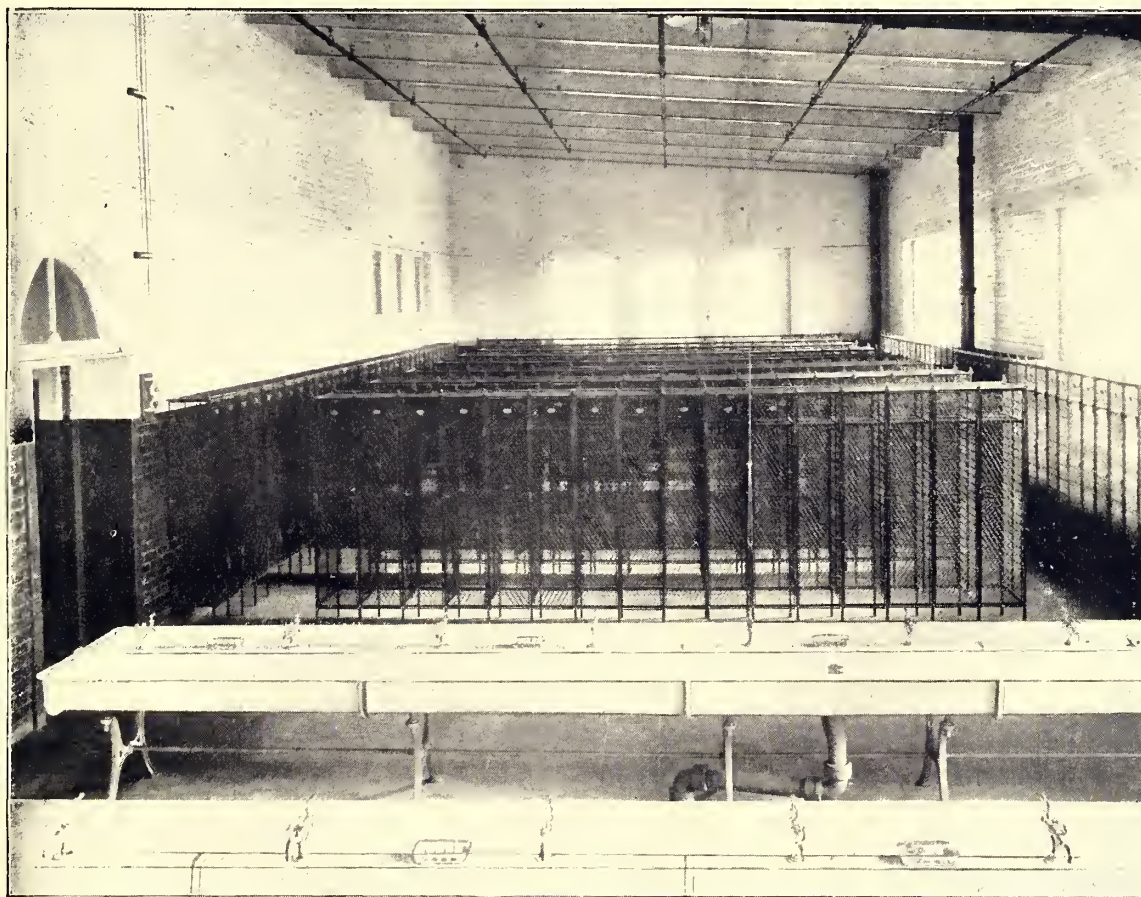


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**EXPANDED METAL LOCKERS**  
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NEW YORK CENTRAL & HUDSON R. R. R.  
NEW YORK, NEW HAVEN & HARTFORD R. R.

# The Murray Hill Hotel

Park Avenue, 40th to 41st Streets, New York

**T**HE situation of the Murray Hill Hotel is considered one of the most superior in New York City. It occupies an entire block on Murray Hill, the famous residential section of New York and the highest point of ground within the city limits.

On account of its high elevation, it is the coolest hotel in summer, and is conducted on both the American and European plans.



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Street Railway  
Association**

**One Block from Grand Central Station**, terminus of the N. Y. C. & H. R. R. R.—N. Y. & Harlem—Adirondack & St. Lawrence—Delaware & Hudson—N. Y., N. H. & H. R. R.—Boston & N. Y. Air Line.

**Six Minutes** by electric cars to West Shore Ferry—**Twelve Minutes** by electric cars to Pennsylvania and Erie R. R. Ferries.—**Seven Minutes** by electric cars to L. I. R. R.

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**Baggage Transferred to and from Grand Central Station Free of Charge**

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Delegates to the annual convention of the AMERICAN STREET RAILWAY ASSOCIATION traveling over the New York Central will arrive in New York City at the Grand Central Station. A ride of less than ten minutes on the cars of the Metropolitan Street Railway Company will take them to Madison Square Garden, where the meetings are to be held. The Grand Central Station is also within a few minutes of seventy-seven hotels, fifty-five clubs and forty-four theatres—and with a train every hour for the North and West.

For further information regarding the New York Central service to the AMERICAN STREET RAILWAY ASSOCIATION convention, apply to local ticket agents, or to

**GEO. H. DANIELS, G. P. A.**

Grand Central Station, New York

## To the New York Convention of the American Street Railway Association via the **WABASH**

### To Street Railway and Supply Men :

For the above meeting the Wabash Railroad will make a rate of \$23.70 for the round trip from Chicago, on the certificate plan.

A special train consisting of elegant Pullman sleepers will leave Chicago at 3:00 p. m., Monday, October 7th, from Dearborn Station, Dearborn and Polk Sts., to run through via Detroit, Buffalo and West Shore Railroad. A special sleeper will be held for ladies, and gentlemen and their wives. For those who are not able to take the special, the Wabash has trains as follows :

Continental Limited, leaving Chicago 11:00 a. m., arriving in New York at 3.30 p. m. next day ;  
Eastern Express 11:00 p. m., arriving in New York at 7:30 a. m. second morning.

Stop-overs will be allowed in Buffalo, in either or both directions, to visit the Pan-American Exposition.

The party will be personally conducted by Mr. N. C. KEERAN, who had charge of the Street Railway special trains to Montreal, St. Louis, Niagara Falls and Boston.

For Railroad and Sleeping-car Reservations, apply to

N. C. KEERAN, C. P. & T. A., Wabash City Ticket Office, 97 Adams St.

C. S. CRANE, Gen. Pass. and Ticket Agent,

F. A. PALMER, Ass't Gen. Pass. Agent,

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# Street Railway Men

in attending their

Annual Convention in New York, October 9-11, will find the perfection of railway comfort in the luxurious through trains of the LACKAWANNA RAILROAD

## 400 Miles of the Finest Scenery in the World

Four superb trains daily between Chicago and New York in connection with the Nickel Plate. Through sleepers daily between St. Louis and New York via The Wabash Railroad. Lackawanna Dining Cars on all through trains. Meals a la carte. Information and tickets at 429 and 1183 Broadway, New York; 289 Main St., Buffalo; 103 Adams St., Chicago



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To New York, Boston and the East  
**SPECIAL LOW ROUND TRIP RATES**  
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Through Trains with magnificent equipment leave Chicago 10.30 a. m., 3.00 p. m. and 11.30 p. m. daily, as well as the Pan-American Special, leaving Chicago 6.00 p. m. daily and arriving at Buffalo 7.45 a. m. Send 4 cents postage for Pan American Souvenir Folder. O. W. RUGGLES, G. P. & T. A., Chicago.



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**PRICE, \$5.00.**

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# American Street Railway Association Convention

NEW YORK, OCTOBER 9-11, 1901.

**T**HE ERIE RAILROAD offers special facilities for those desiring to attend the Annual Convention of The American Street Railway Association, to be held in New York, October 9th to 11th, particularly from Chicago, Cincinnati, Cleveland, the West. A train consisting of Pullman equipment of the best type yet produced, and with Dining Car serving all meals a la Carte except dinner, which will be table d'hote, will leave Chicago, Monday, October 7th, at 3 P. M., Cincinnati 6.25 P. M., and Cleveland 11.30 P. M., arriving New York next evening at 7.55 P. M. We therefore beg to suggest, in the interest of the comfort and enjoyment of all who will attend the convention, that those from points west of Chicago rendezvous at that point and leave at 3 P. M. on the train named with the Chicago delegation.

Those from Cincinnati, Cleveland and points east of Chicago will join the party from the west en route.

All tickets reading via the Erie Railroad to New York City from Jamestown, N. Y., and points west, are good for passage through Buffalo, and a ten days' stop-over may be secured at that point to visit the Pan-American Exposition by depositing the ticket with Joint Agent and the payment of nominal fee of \$1.00. It is suggested however, that parties come direct to New York and take advantage of the stop-over on the return trip (which may be secured under the same conditions) to visit the Exposition.

The Erie Railroad has long been known as the "Picturesque Trunk Line of America," and the many scenic attractions along this route will unquestionably make the trip highly satisfactory to all who are able to avail themselves of it.

Kindly write Mr. F. W. Buskirk, A. G. P. A., Erie Railroad, Chicago, at once, stating the sleeping car accommodations that you will require.

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## Big Four

The  
'Buffalo  
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# THE FINEST TRAIN IN THE WORLD

For the delegates to the  
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## The Lake Shore & Michigan Southern Railway

will give special attention to the accommodation of delegates and their friends attending the meeting of the

### American Street Railway Association

to be held at New York Oct. 9th, 10th and  
11th. Delegates will leave Chicago via

## THE LAKE SHORE LIMITED

Monday, Oct. 7th, at 5:30 P. M., arriving at Buffalo at 6:50 A. M. Tuesday.

A stop-off privilege will be given so that passengers  
may spend Tuesday, Oct. 8th, in Buffalo.

### A Day at the Pan-American Exposition

The party will leave Buffalo Tuesday evening  
via New York Central & Hudson River Rail-  
road, arriving in New York City at the . . .

#### Grand Central Station, (TEN MINUTES FROM CONVENTION HALL,)

Wednesday morning, Oct. 9th, in time for breakfast.

Leaving Buffalo, the party will also include the

Cincinnati, St. Louis, South and Southern delegations.

CITY TICKET OFFICE OF THE  
**LAKE SHORE & MICHIGAN SOUTHERN RAILWAY**  
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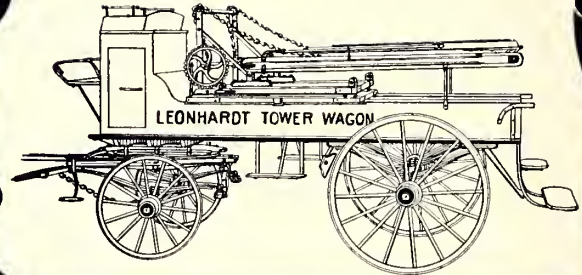
Derselbe Trolley-Wagon ist bereits auf allen Haupt-Strassenbahnsystemen Amerikas eingeführt.

Este Wagon ha sido adaptado por las principales lineas en America.

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Absolutely prevents noise and does not ooze out of gear case. "Lasts three times as long as any other lubricant."

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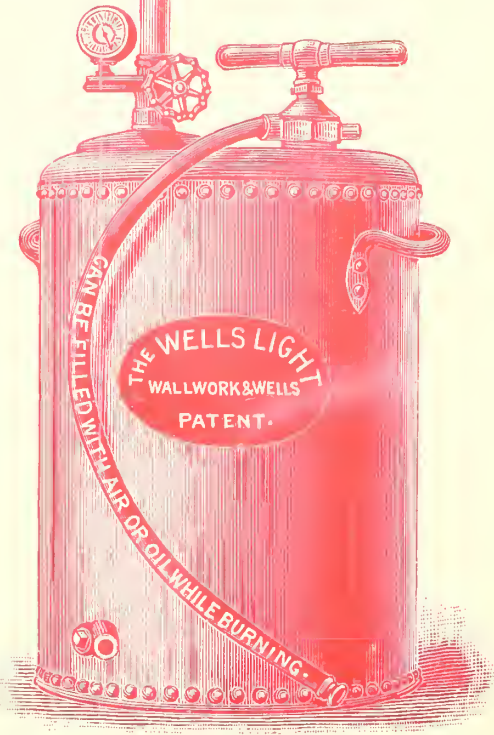
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In Use in  
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ALL SIZES: 800, 2,000 to 4,000 Candle  
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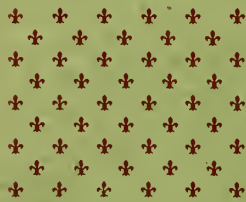
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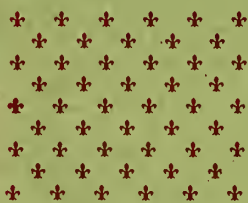
## THE ELEVATED



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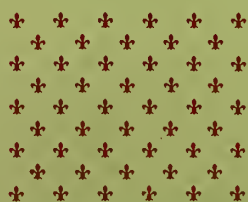
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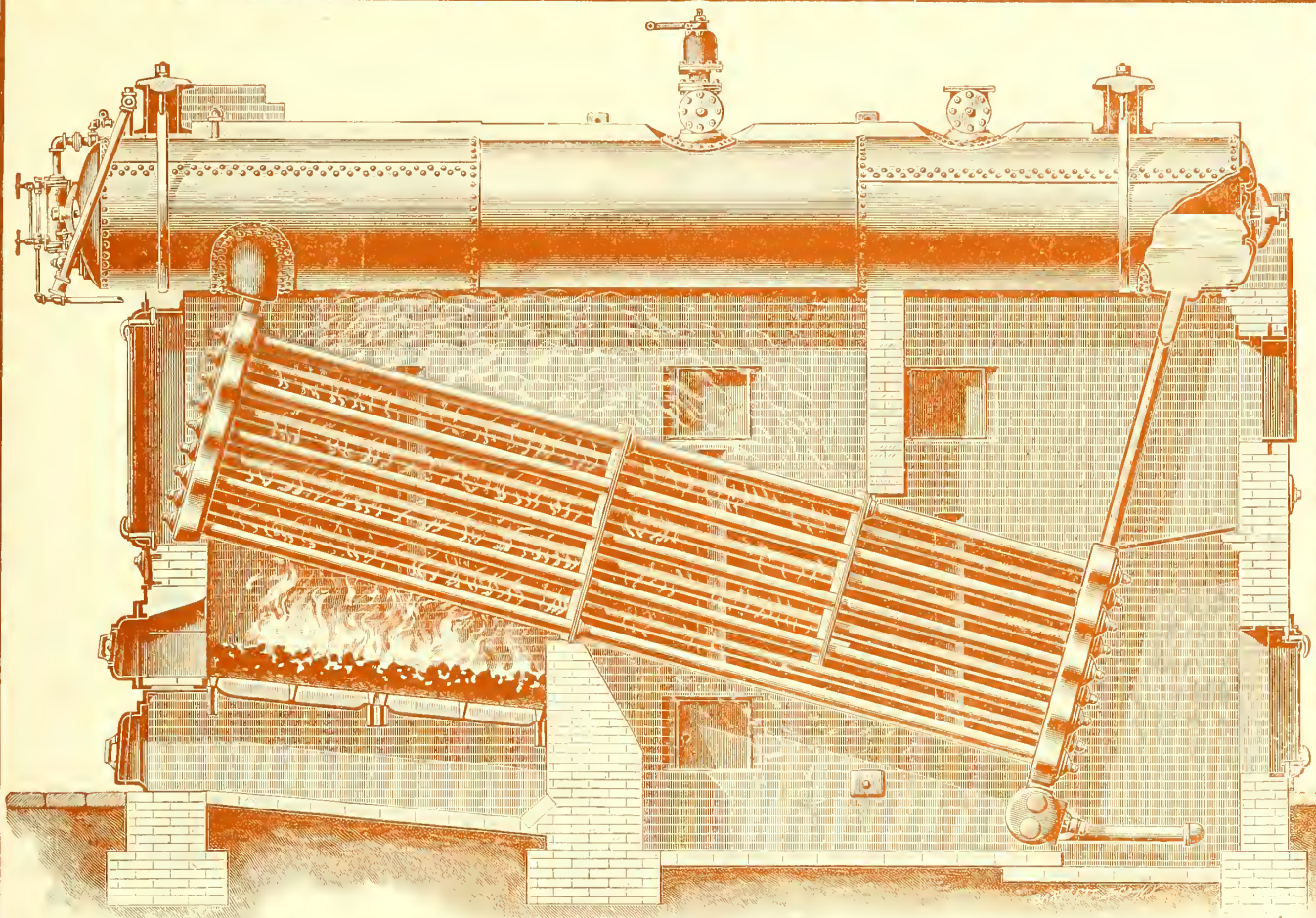


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IF SOME OF THE LARGEST CONCERNS IN THE UNITED STATES USE STIRLING BOILERS WITH PROFIT TO THEMSELVES, AS THEY DO

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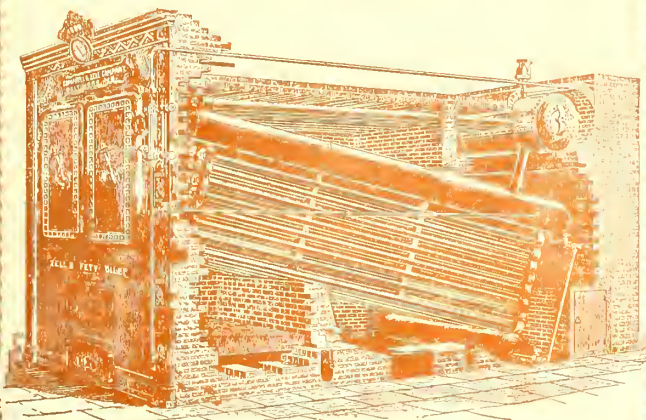
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Water Tube, Marine, Horizontal Tubular Boilers. Self Supporting Steel Stacks. Riveted Steel Pipe. Tanks. Heavy and Light Plate Work.

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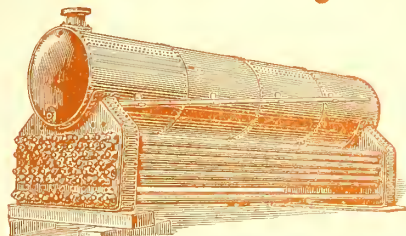
A word as to the design and construction of these "Cochranes." They are designed for taking care of either large or small quantities of water, and their work is done in a plain, practicable, understandable way. As for the construction, we make them first-class in every detail, workmanship and material. If you don't happen to know our "Cochranes"—their effectiveness—their good work—how we make them—kind of flanges and fittings we furnish—then we would like to have you order one on approval (for comparison with the "other fellow's"), subject to return, at our expense (we paying the freight both ways), if you cannot see the differences: for we are always glad to send them to responsible parties on approval, and also subject to trial and return.

They've made a great record, have these "Cochranes." Thousands of them in use in live steam mains, and thousands in exhaust steam mains—these latter protecting something like 4,000,000 H. P. of boilers at the present time.

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**Heine Safety Boiler Co.,** 421 Olive St., ST. LOUIS, MO.



**ECONOMICAL,  
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Shops at Phoenixville, Pa.; St. Louis, Mo., and Chicago, Ill.

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Our methods are selling heaters to those who have use for heaters. The economy in coal, water and labor effected by

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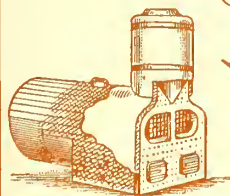
leaves no doubts, no "take backs." We have representatives everywhere—and some of our customers for to talk to.

We have, too, some little books, the mere reading of which may prove an inspiration that will save you money.

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**WHEN WRITING TO ADVERTISERS** in the STREET RAILWAY JOURNAL you will confer a favor on both publisher and advertiser by mentioning this paper.

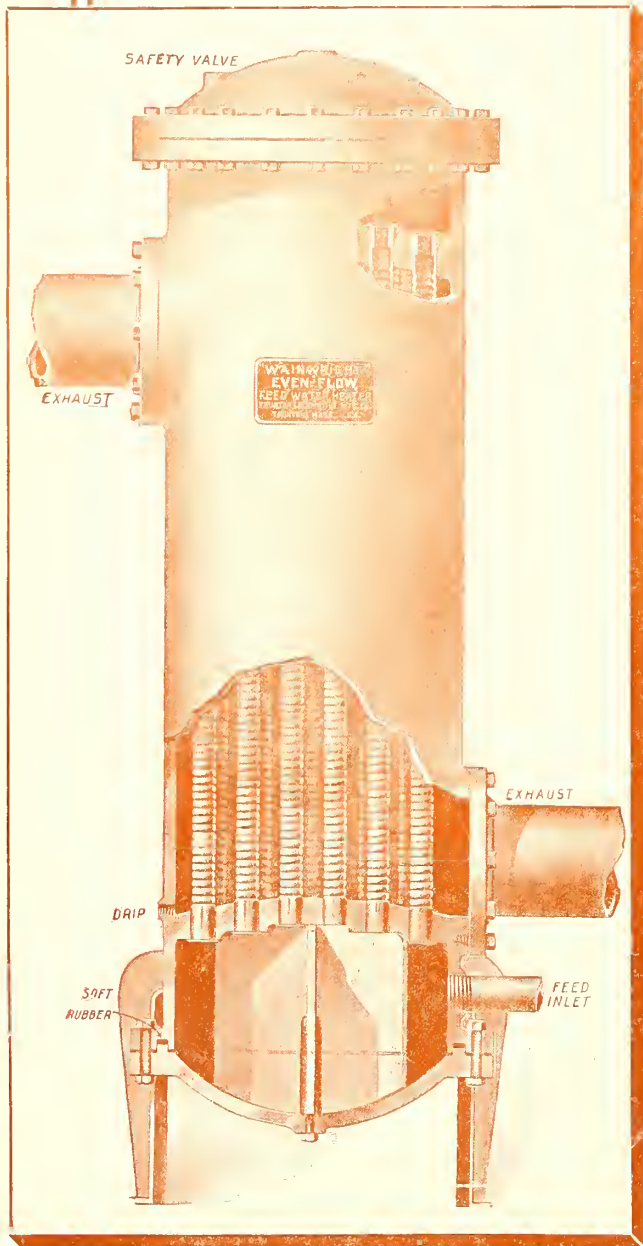
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Taunton, Mass, U. S. A.

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OF

# WAINWRIGHT STEAM APPLIANCES

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## *The Wainwright* Even-Flow Feed Water Heater

Is built of high-grade cast iron and has pure copper tubes,

### **CORRUGATED**

These tubes will transmit 100 per cent more heat per square foot than smooth tubes under same conditions. The feed water circulates so as to use all the heating surface uniformly.

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**Charles H. Paine, 85 Liberty Street, New York**

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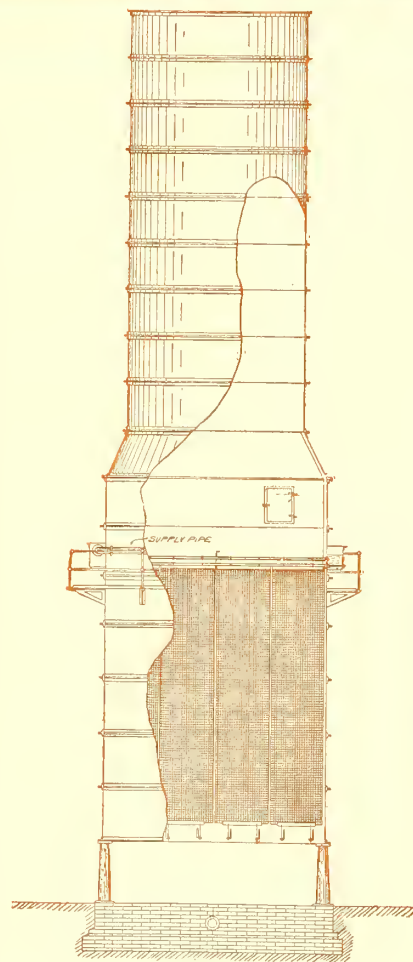
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Feed Water Heaters  
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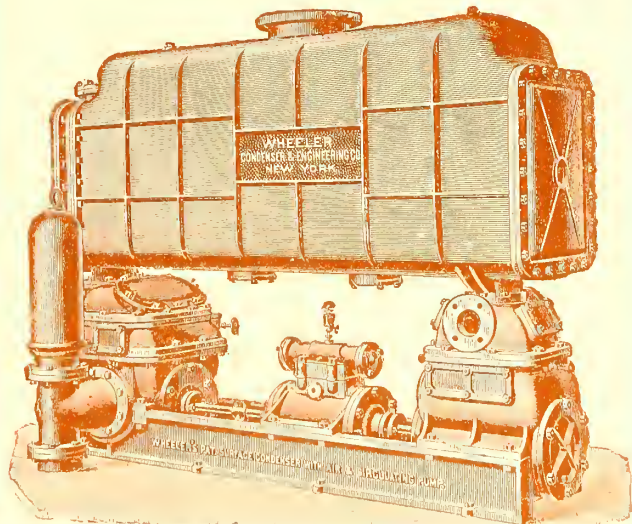


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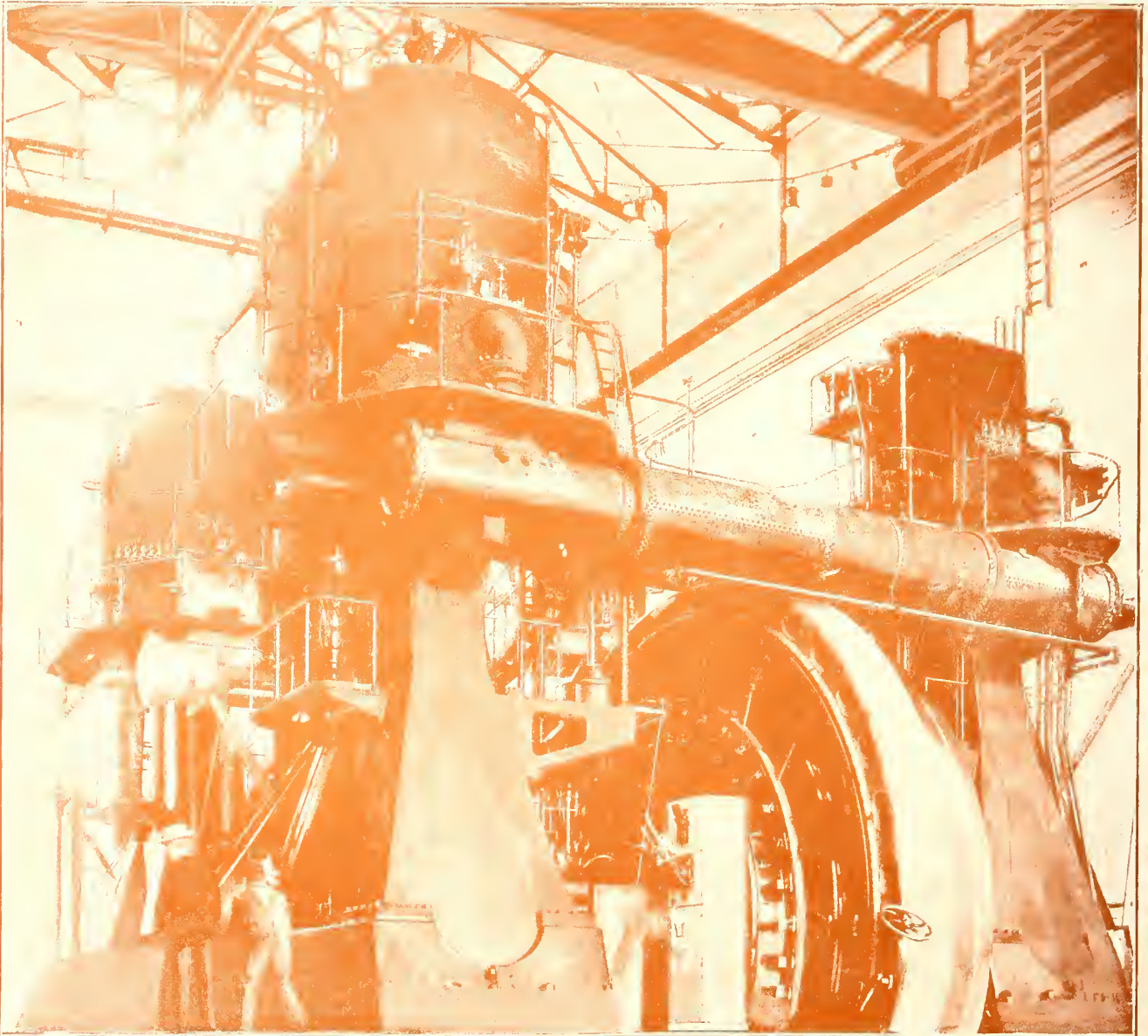
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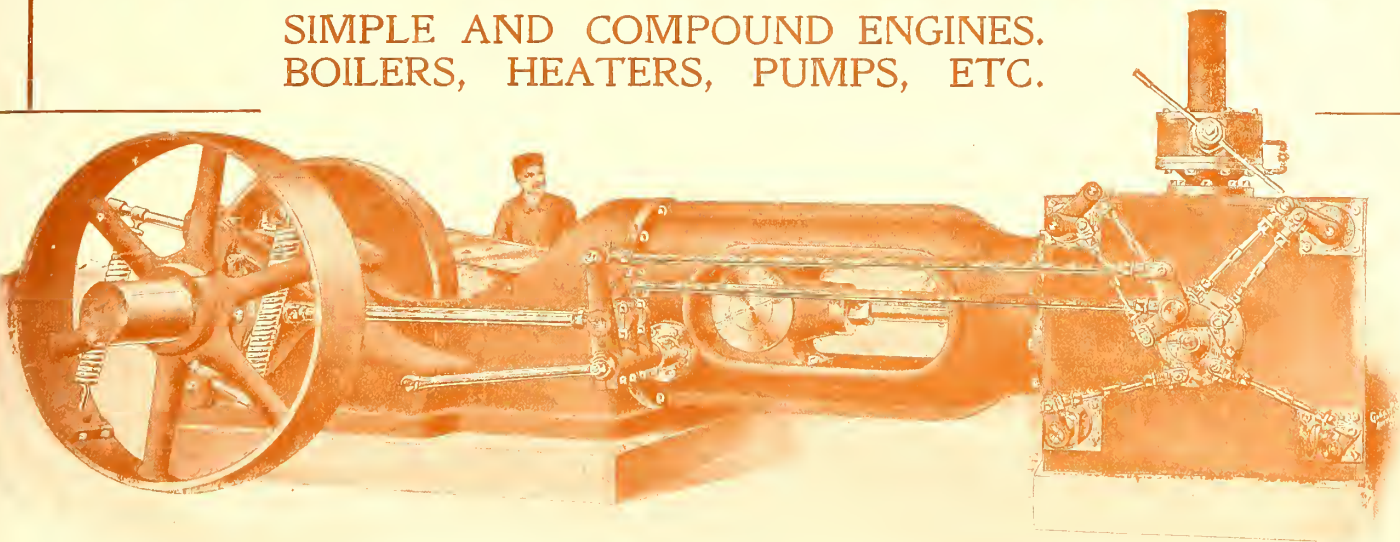
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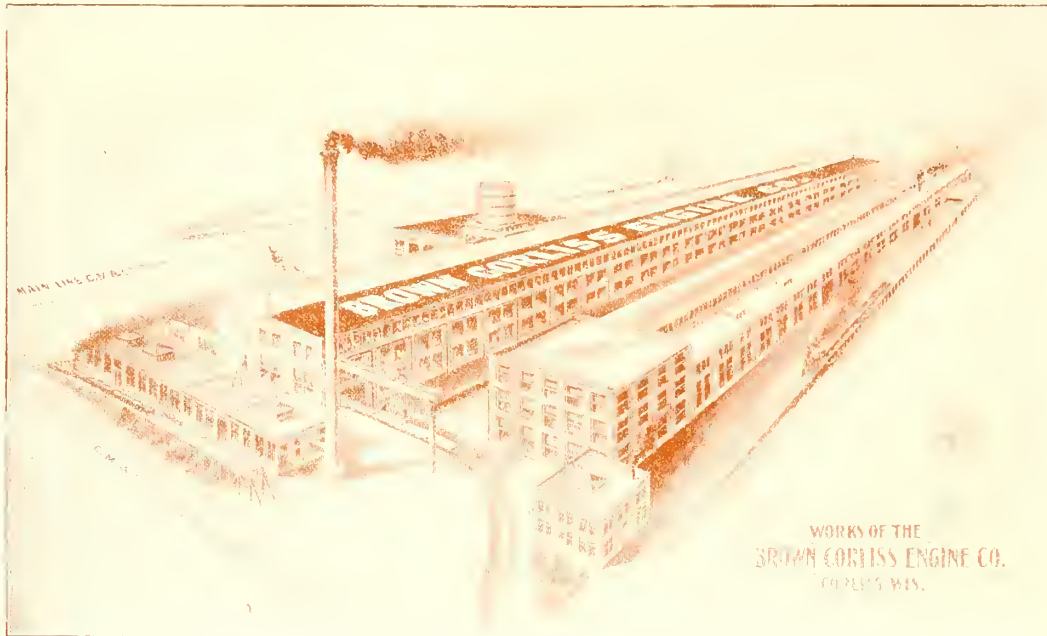
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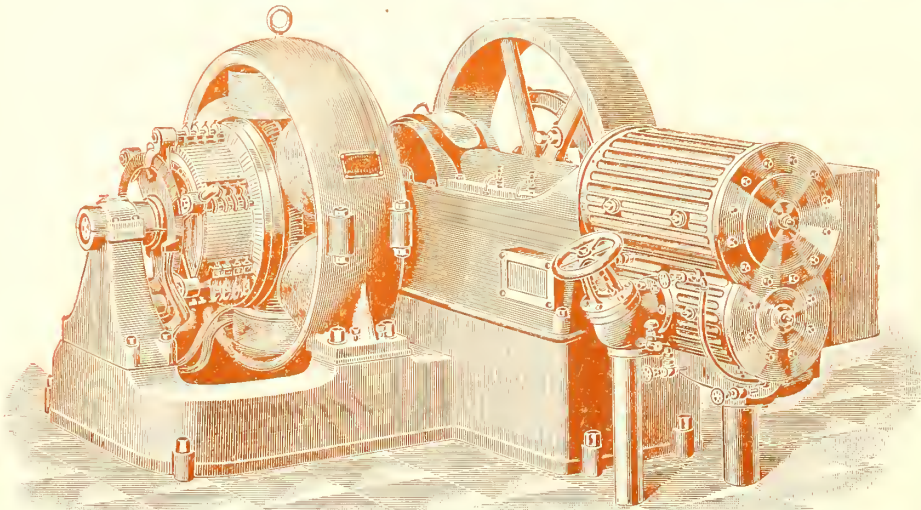
now under construction at Corliss, formerly Western Union Junction, Wisconsin, which will be completed by November 30th, of this year.

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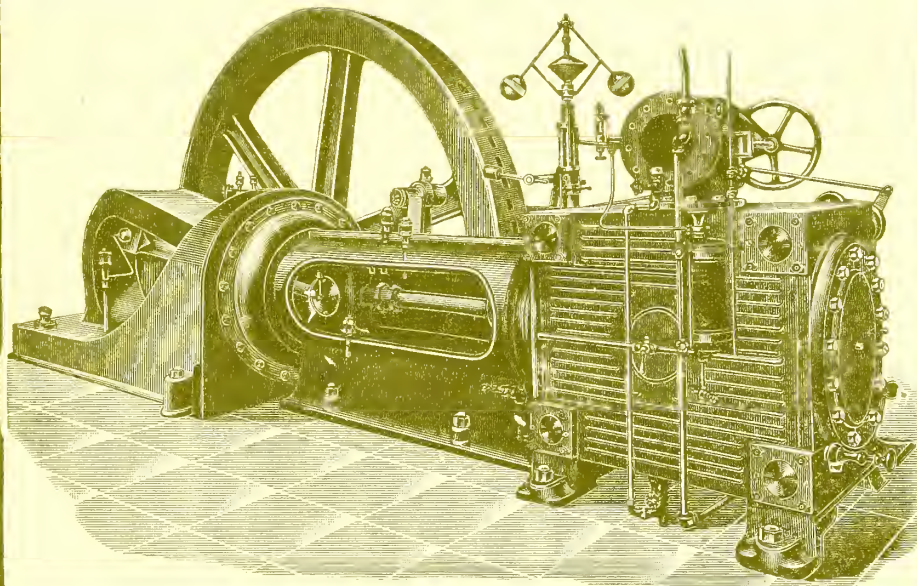
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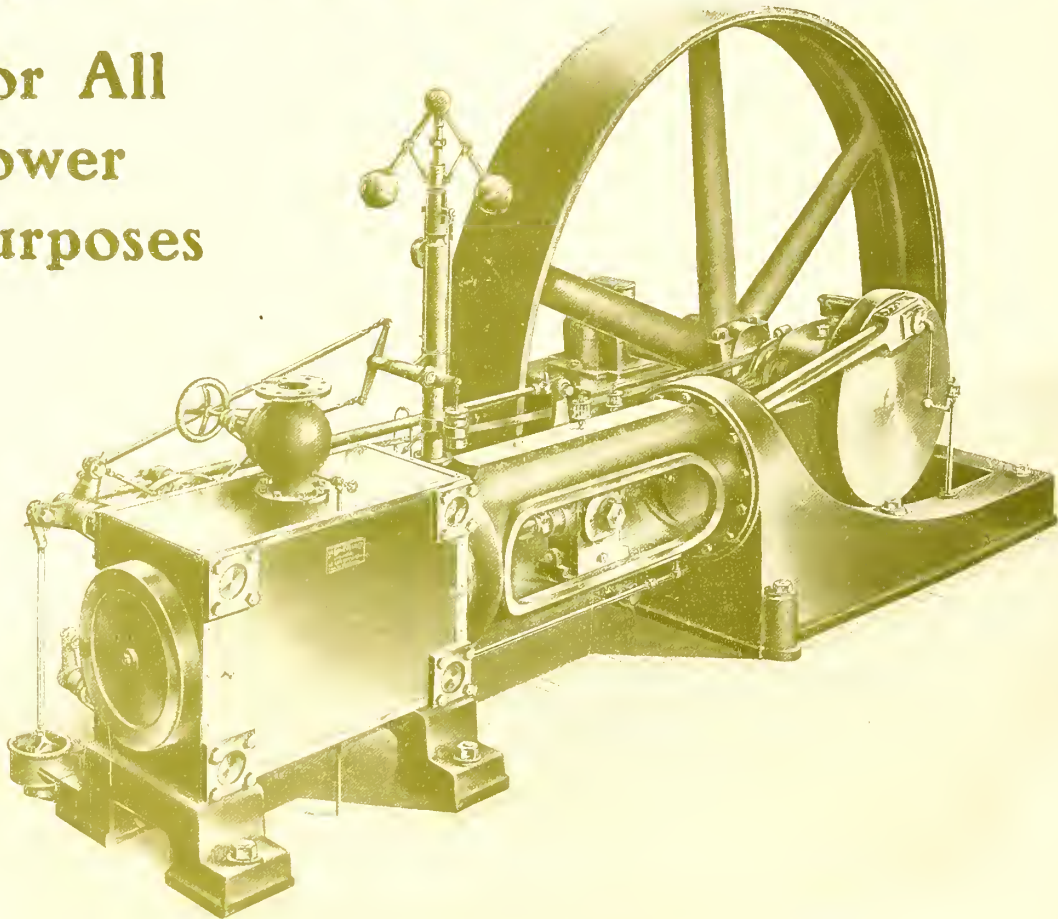
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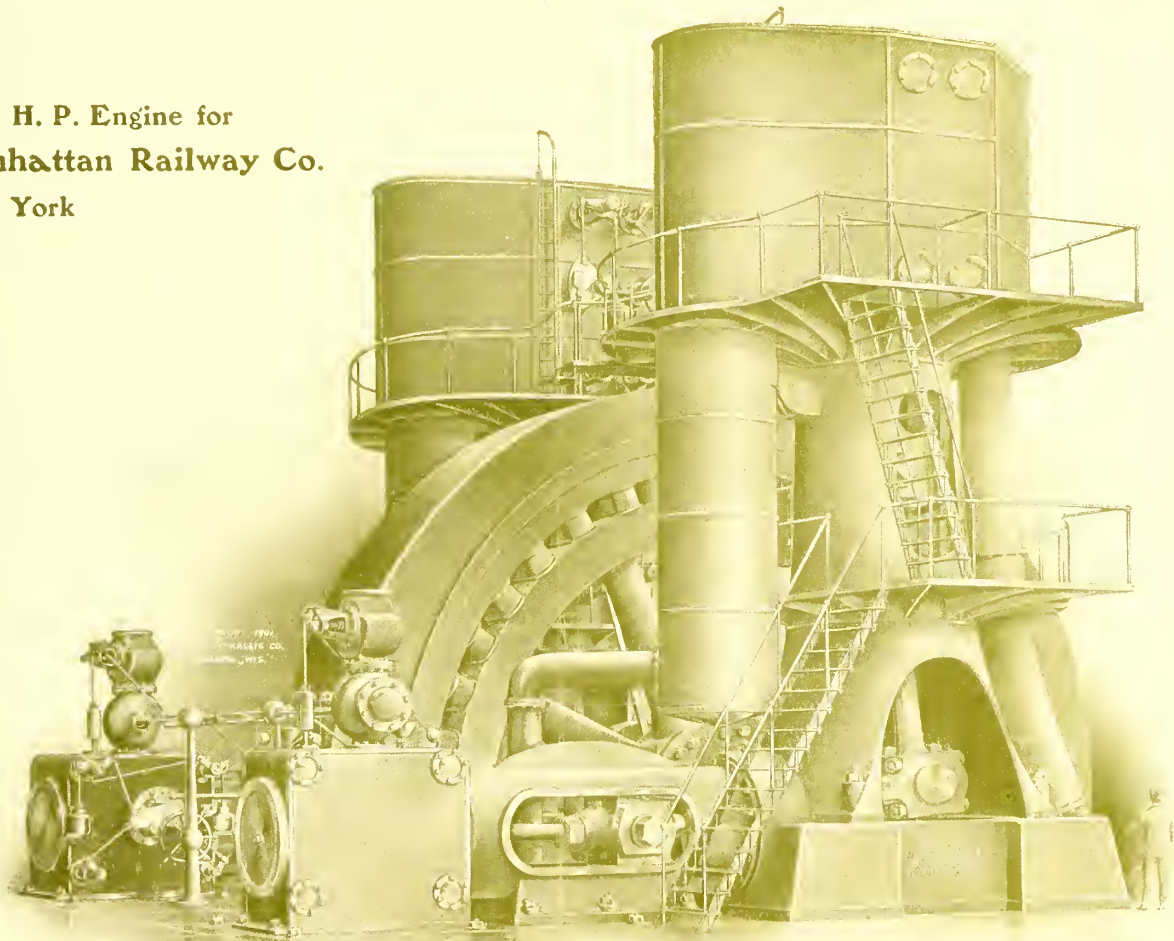
New York, Broad Exchange Bldg.  
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**T**HE ALLIS-CHALMERS COMPANY has been awarded the contract for eight engines for the New York Subway, practically duplicates of the Manhattan engines, the unique design of which has been received with great favor by the most eminent engineers and Street Railway officials of America. The Allis-Chalmers Company has the proud distinction of furnishing power for the three great railway systems of New York City, namely, **Elevated, Surface, Underground** **Elevated**, which contract was for eight engines of the Reynolds-Corliss type of combined vertical and horizontal design, each rated at 8,000 H. P. for its most efficient load and capable of operating continuously under a load of 12,000 H. P.; also eleven engines for the Metropolitan **Surface**, of the vertical type, each rated at 5,000 H. P. each, with a maximum capacity of 7,500 H. P.; and the contract of the Rapid Transit Railway for the New York Subway, or **Underground**, calls for eight engines of the combined vertical and horizontal type, cylinders 42 inches and 86 inches by 60 inches, each rated at 8,000 H. P., with a maximum of 12,000 H. P. Each of these New York Subway engines will weigh over 700 tons without wheels, and like the Manhattan, engines are the largest stationary engines ever built.

8,000 H. P. Engine for  
Manhattan Railway Co.  
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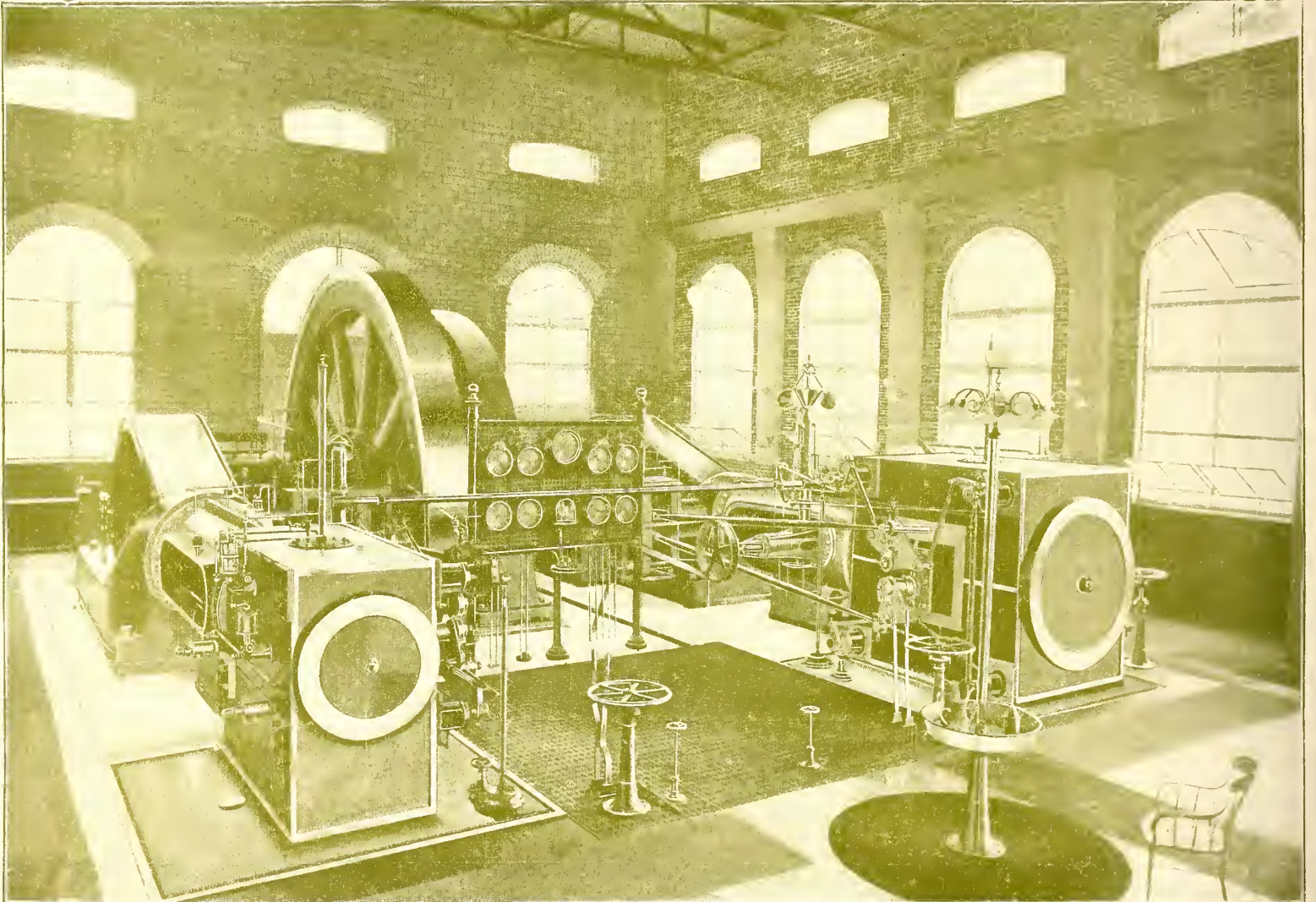
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Engines of 50 to 5000 H. P., with Girder or Heavy Duty Frames, Simple and Compound for Every Kind of Service.



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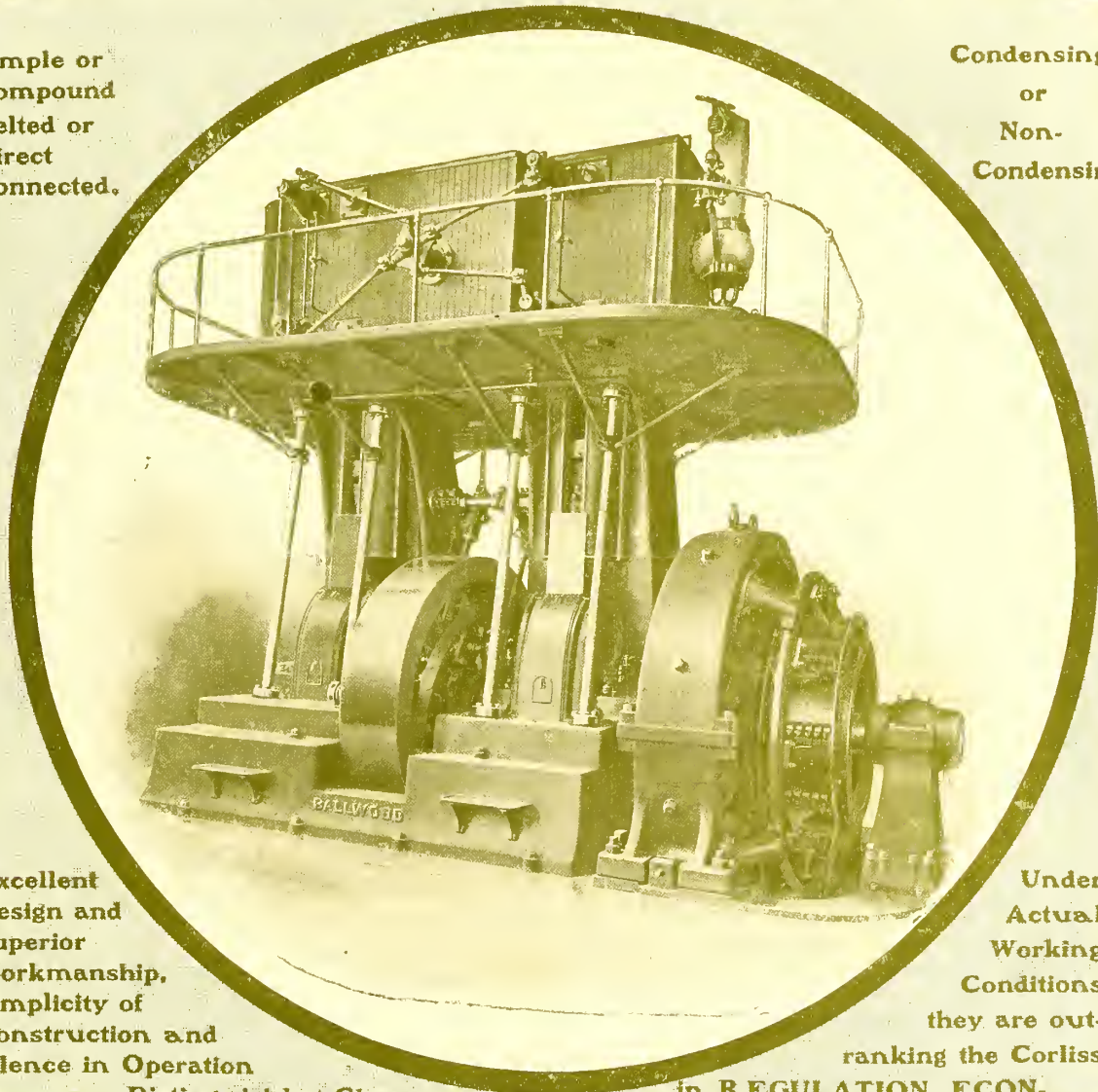
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Especially Designed for  
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Simple or  
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Condensing  
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Excellent  
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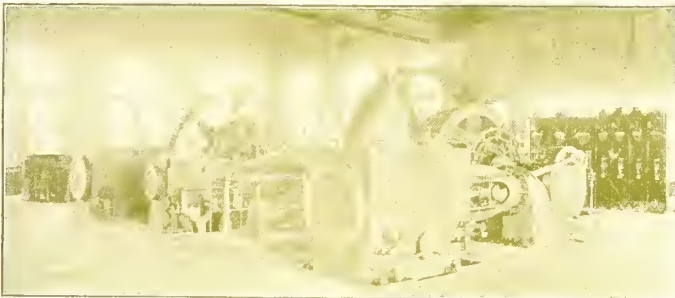
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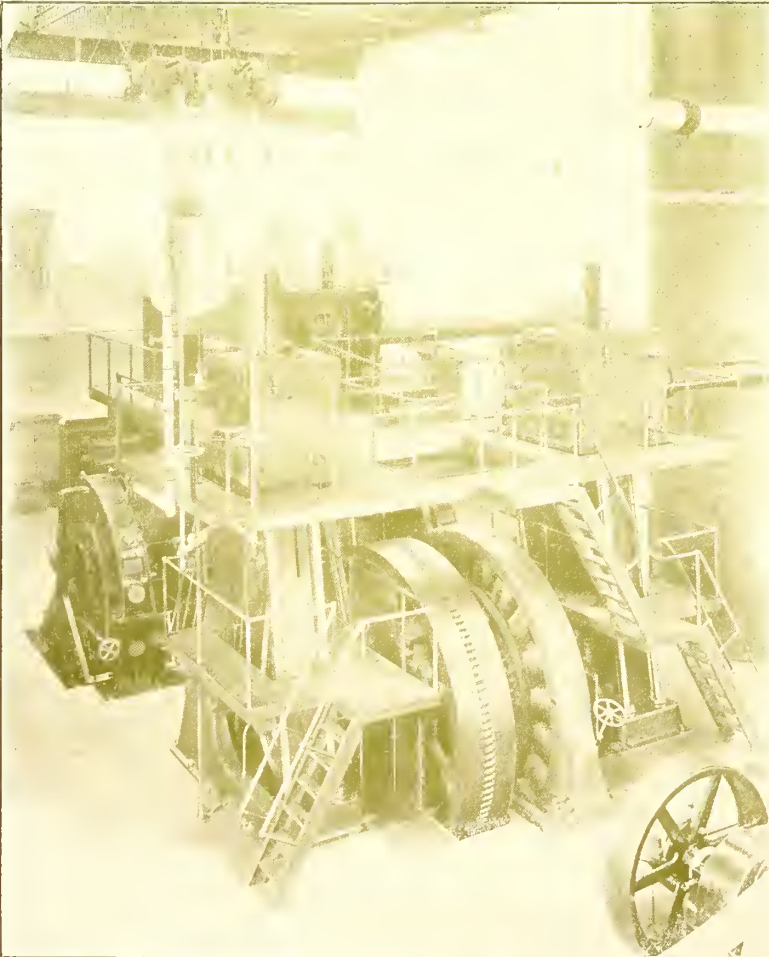
Are operating many of the most up-to-date electric railways.  
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SIMPLE OR COMPOUND**

With our special arrangement of valves, all the advantages of the Corliss gear are retained and the further advantage of a much quicker cut-off is added.

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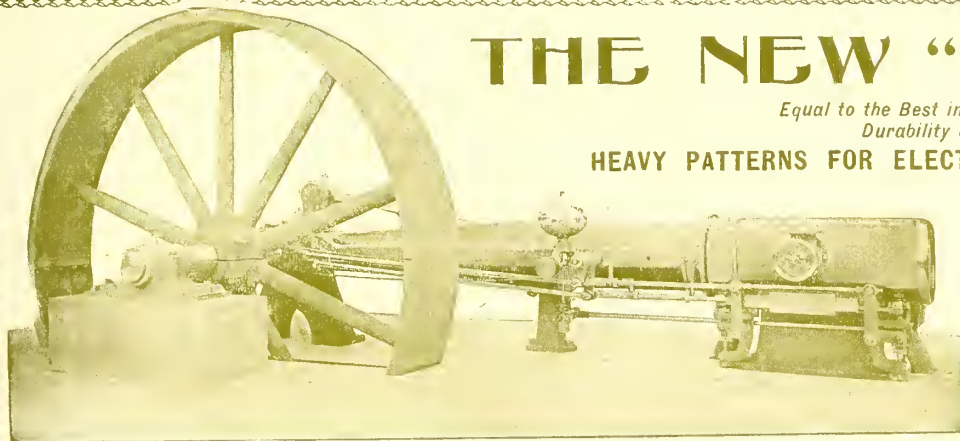
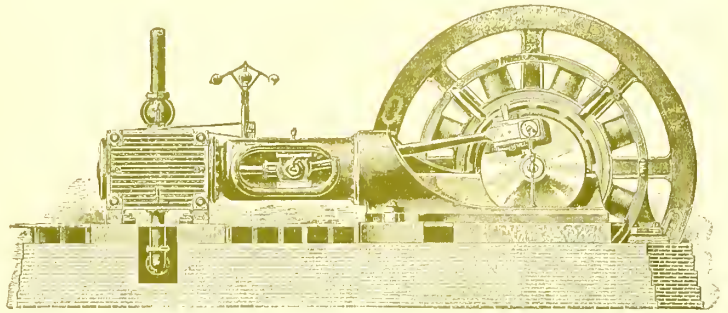
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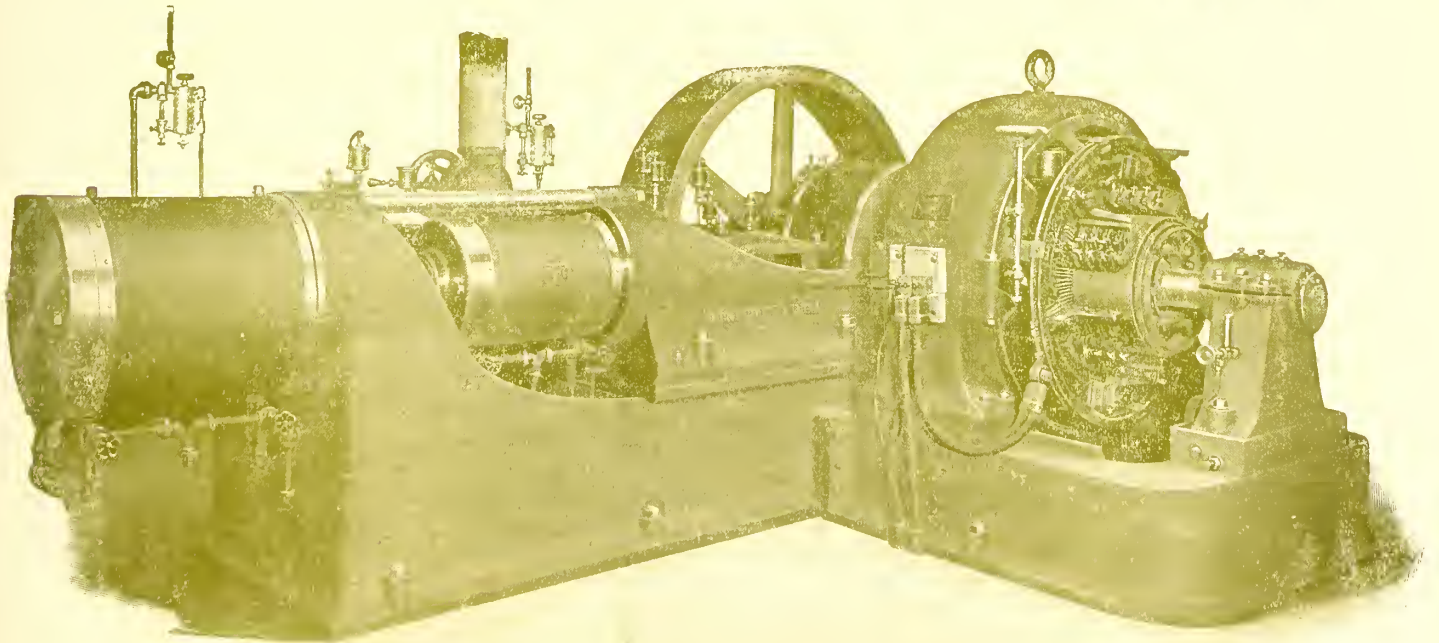
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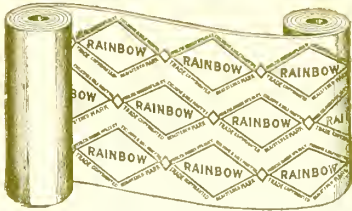
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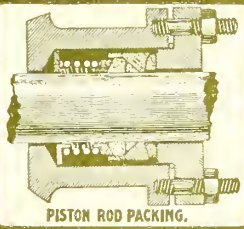
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 Don't have to use wire and cloth to hold Rainbow. Can't blow it out. Thousands of imitators. No equal. Will hold highest pressure.

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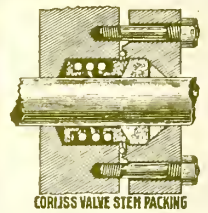


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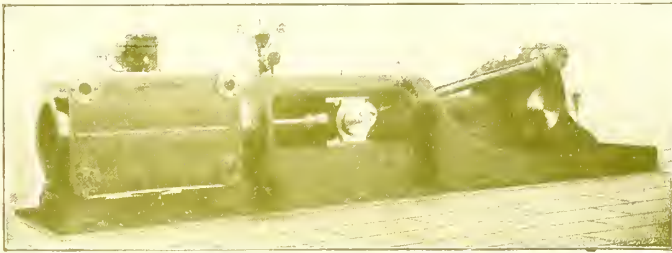
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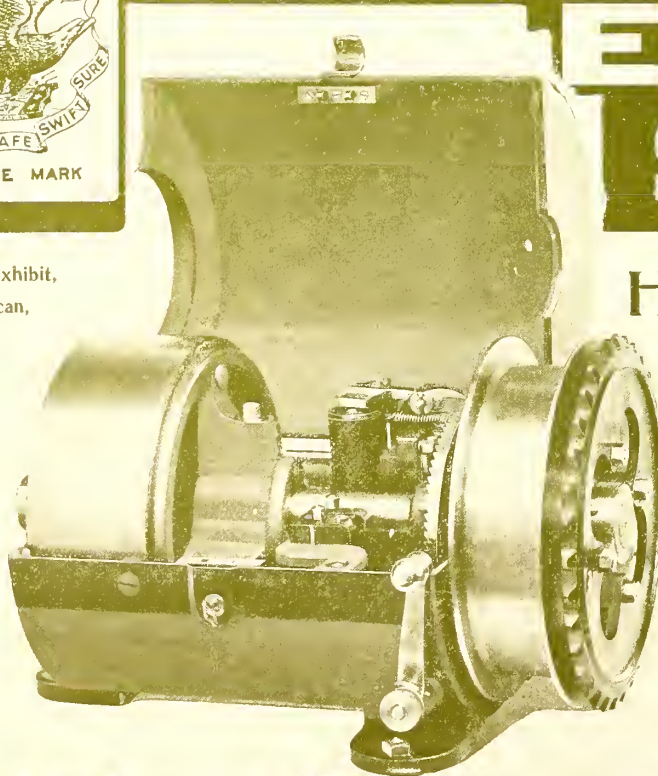
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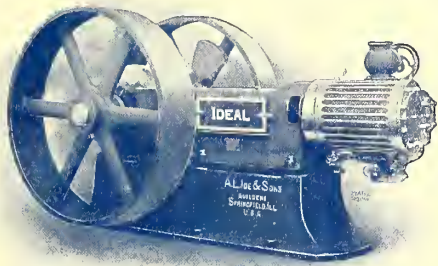
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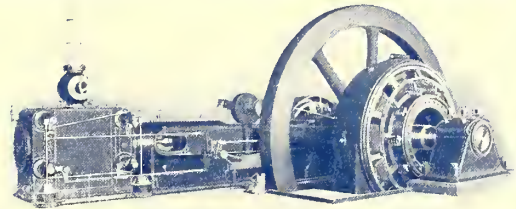
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## Rice & Sargent and Improved Greene **ENGINES**

are the product of the best mechanical skill and have the preference with the most exacting users. We have under construction engines as large as any yet built for stationary purposes,—4,000 H. P. Our smallest size is 60 H. P.

Our engines are furnishing power for electric light and railway plants, alternating (parallel operation) and direct current, mills and factories of every description. Our product is preferred for any use requiring highest economy, best mechanical efficiency, and utmost delicacy of speed regulation.

We are the sole builders of the above engines and solicit correspondence with those wishing to get minimum power results.



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Successors to Providence Steam Engine Co., also to Rice & Sargent Engine Co.

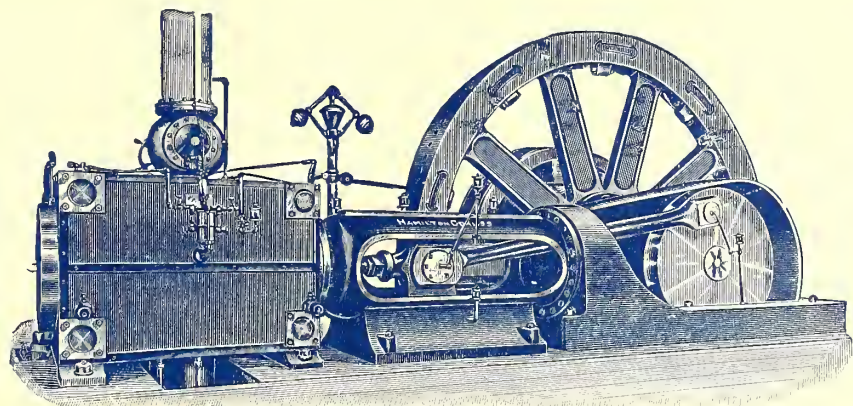
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# Hamilton Copliss Engines

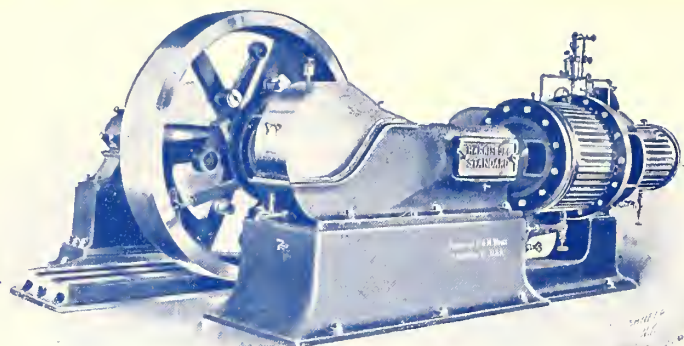
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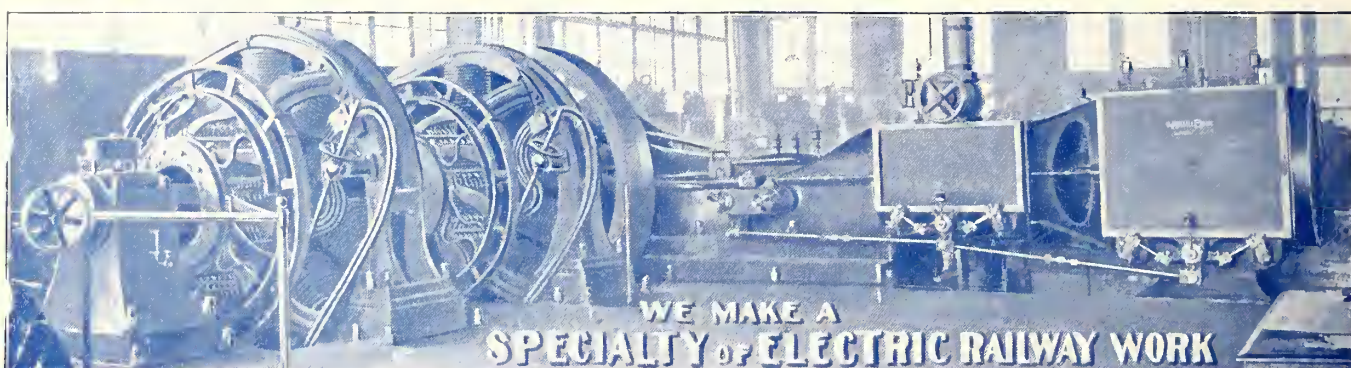
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MEDIUM SPEED AND CORLISS

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HARRISBURG STANDARD TANDEM COMPOUND ENGINE  
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## THE RUSSELL ENGINE CO., Massillon, Ohio, U. S. A.



WE MAKE A  
SPECIALTY OF ELECTRIC RAILWAY WORK

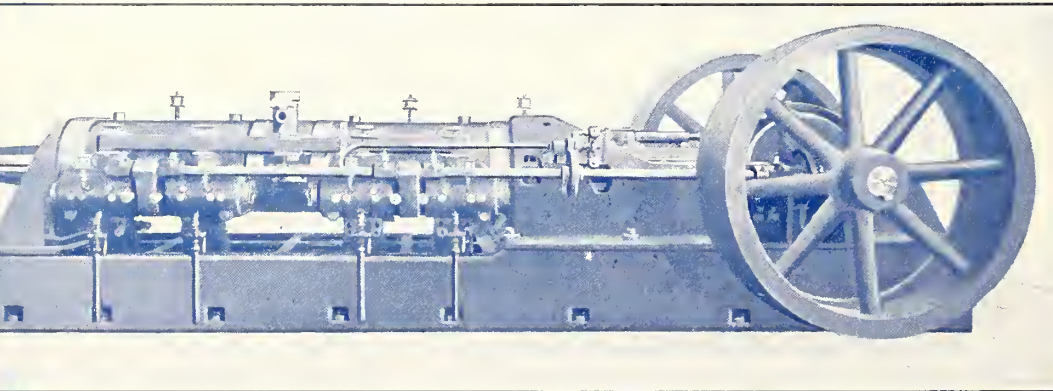
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**For use in Electric Lighting or for driving Railway Generators, Belted or Direct Connected.**

Built in standard sizes from 15 H.P. up to 2,100 H.P., or larger to order. Quick delivery up to and including 400 H.P. rated or 600 H.P. actual. Patterns on hand for sizes up to and including 1,000 H.P.

Two regular impulses each revolution. Governing effected by throttling a mixture of constant strength. Ball-bearing Governors. Speed regulation within two per cent. from no load to full rated brake load. Each engine tested to overload on large generators. Variation in angular velocity guaranteed to be within 1 1/2 per cent. or within 1/4 of a degree. Speed changed at the switchboard. Engines adapted for and guaranteed to operate perfectly on natural, illuminating or producer gas, on 10,000 B. T. U. per H. P. hour. All wearing parts are adjustable for wear. Strictly high-grade workmanship and the very best of material only is used. All parts made interchangeable and replaceable. All repairs free for two years unless damage is caused by accident or carelessness.



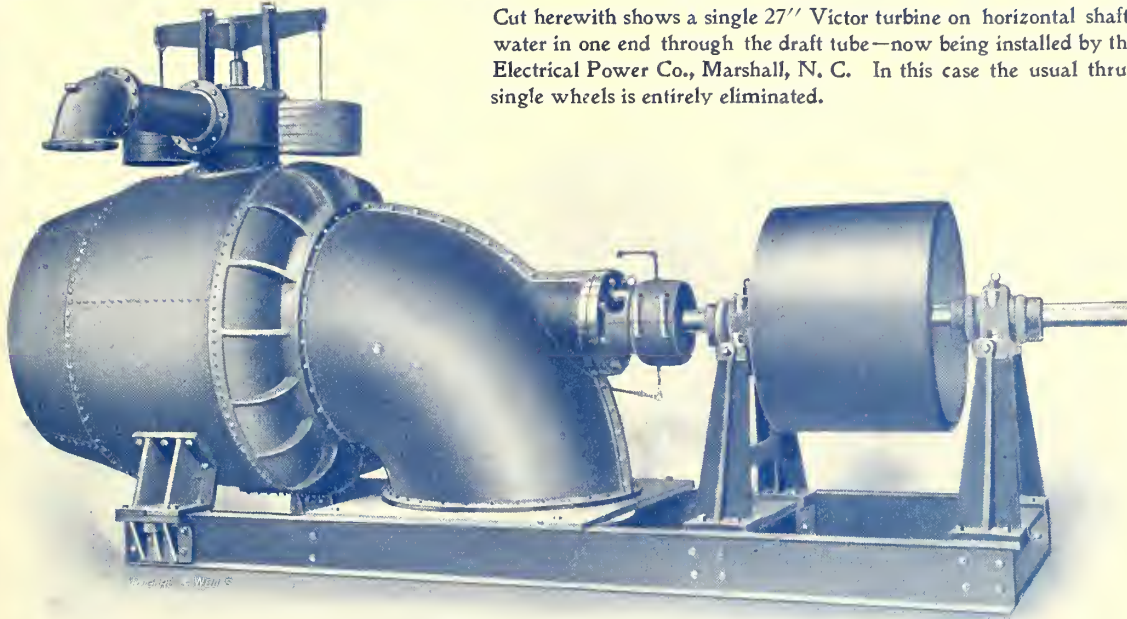
**THESE** engines are especially adapted for use in small electric street railway stations where the variation in load is violent and excessive, and where large momentary overload capacity is imperative . . .

These engines run on one pound of coal per Brake horse power hour, using Producer Gas.

All surfaces exposed to internal heat are thoroughly water-jacketed. This includes the hollow pistons and nickel steel piston rods (through which a constant stream of water is flowing), the valve seats, cylinders and cylinder heads. Consequently, very high compression may be and is used, insuring the greatest economy of fuel, absorbing all inertia from the reciprocating parts, minimizing the work on bearings, and securing noiseless and non-vibrating action at full speed, and on excessive loads, and on instant changes from heavy loads to nothing, and *vice versa*. All engines rated at 45 lbs. M. E. P., but capable of and proportioned for loads requiring 80 lbs. M. E. P. Engines put in on approval for responsible parties either in new plants or to replace steam engines. Parties desiring further information are invited to write or call at the works and see for themselves tests, etc.

## STANDARD AUTOMATIC GAS ENGINE CO., OIL CITY, PA., U. S. A.

# VICTOR TURBINES



Cut herewith shows a single 27" Victor turbine on horizontal shaft, discharging the water in one end through the draft tube—now being installed by the North Carolina Electrical Power Co., Marshall, N. C. In this case the usual thrust connected with single wheels is entirely eliminated.

We also build  
Steam and  
Power Pump-  
ing Machinery  
for every ser-  
vice, Feed  
Water Heat-  
ers, Air Com-  
pressors, Con-  
densers, Filter  
Presses, Oil  
Mill Machin-  
ery, etc.



*Our new  
Catalogue  
describes  
many other  
styles also.*

IF INTERESTED, ADDRESS

## THE STILWELL-BIERCE & SMITH-VAILE CO.

311 Dearborn St., Chicago  
141 Broadway, New York  
73 Oliver St., Boston

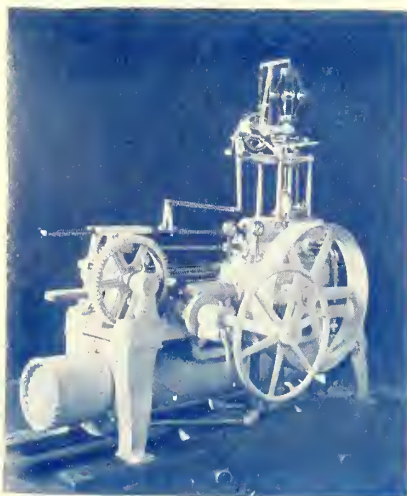
612 Arch St., Philadelphia  
304 Hennen Bldg., New Orleans  
97 Queen Victoria St., London, E. C., Eng.

282 Lehman St., DAYTON, OHIO, U. S. A.

# LOMBARD WATER WHEEL GOVERNORS

PERFECT REGULATION AND SATISFACTION ASSURED

RANK WITH THE  
HIGHEST GRADE  
MACHINERY  
MADE IN ANY  
COUNTRY FOR  
ANY PURPOSE




THEY ARE IN  
USE IN NEARLY  
EVERY LARGE  
AND DIFFICULT  
WATER POWER  
PLANT



## THE LOMBARD GOVERNOR COMPANY

36 WHITTIER STREET, ROXBURY, BOSTON, MASS.

MANUFACTURERS OF GOVERNORS FOR ALL MAKES OF TURBINE AND IMPULSE WATER WHEELS. AND FOR LARGE STEAM ENGINES. SEND FOR CATALOGUE




"This Makes the Difference"


SEVEN ECONOMICAL FEATURES OF THE "A.B.C." System of Mechanical Draft

Economical in first cost. Minimum operating expense. Cheap fuel burned. Increases combustion. Combustion efficiency greater than with other systems. Waste gases are utilized. Reduces size of boiler plant to minimum. Our catalog No. 118 K gives full particulars.

AMERICAN BLOWER CO. DETROIT  
 NEW YORK: 141 Broadway. CHICAGO: 1550 Marquette Bldg.  
 EUROPEAN BRANCH: 70 Gracechurch St., LONDON.



"The Old Way"



"The New Way"

YOU JUST HAVE TO BUY IT... and set it to work, and the

**Wright Improved Safety Water Column**

will start in fulfilling its mission of safety to life and property, economizing fuel, and prolonging boiler life. Repairs reduced to a minimum. (All working parts attached to the top cap.)

**The Wright Emergency Steam Trap...**

Another worthy product of ours. Perfect in principle and construction. Acts instantaneously.

WRITE FOR CATALOG.




WRIGHT'S IMPROVED SAFETY WATER COLUMN

WRIGHT'S IMPROVED SAFETY WATER COLUMN

**Wright Manufacturing Company**  
 37 Shelby St. Detroit, Mich.



WRIGHT'S IMPROVED SAFETY WATER COLUMN

COMBINED HIGH AND LOW WATER ALARM

# DO IT NOW

"Procrastination is the thief of time." Procrastination is the barrier to progress, the foe of ambition, the death of opportunity. The disposition to put off until a more convenient time what ought to be done to-day and NOW, is the shoal upon which millions have stranded. What defeats, what disasters, what wreckage of human hopes, are traceable to this universal tendency.

Mr. Street Railway Manager:—You doubtless have considered in an indifferent way the question of saving your exhaust steam—utilizing it for heating purposes, after the power has been taken out—but have put off a thorough investigation of the matter.

We have had years of experience and have built over two hundred of these heating plants in different parts of the country. Electric railway companies who are operating our system of exhaust steam heating report that they are paying their entire station expenses and interest on their investment for steam mains from the sale of their exhaust steam.

Don't put it off any longer. Write to us for facts to prove our assertions regarding the profits from the "Holly System." We guarantee results. DO IT NOW.

WRITE FOR OUR NEW PAMPHLET

**THE AMERICAN DISTRICT STEAM CO.**

LOCKPORT, N. Y.

# The Sturtevant System of Mechanical Draft

**COSTS** only one-third as much as  
a chimney

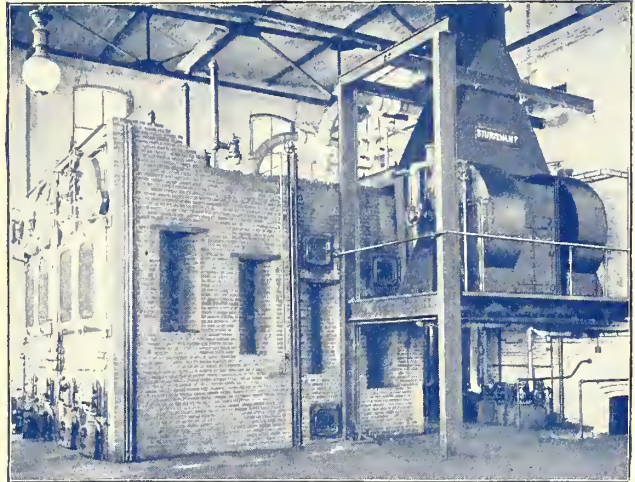
**BURNS** cheap fuel

**INCREASES** boiler capacity

**RESPONDS** instantly to sudden  
demands for more steam

Is **INDEPENDENT** of wind or  
weather

Is **APPLICABLE** to old or new  
plants as auxiliary to or as  
a substitute for a chimney



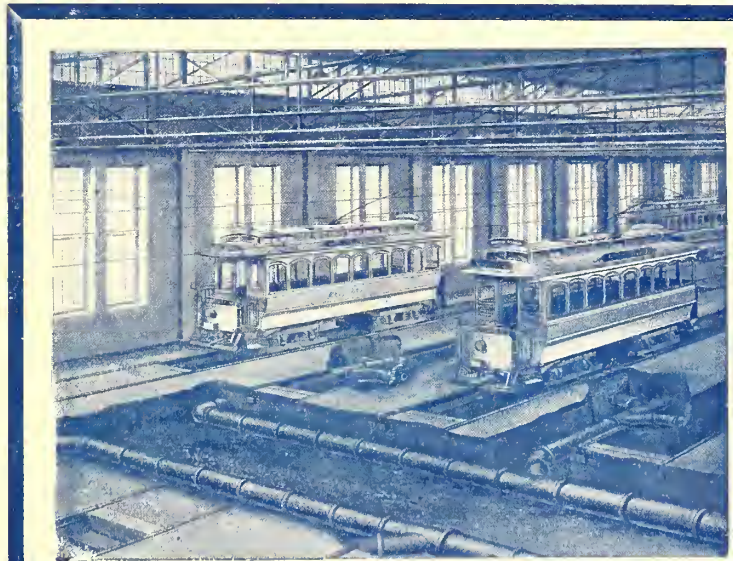
# The Sturtevant System of Heating Car Barns

**REDUCES BY TWO-THIRDS**  
*the time required to melt  
snow and ice from car trucks  
and motors*

**ALSO HEATS** the car barn  
thoroughly by the same  
forced circulation of warm  
air

**NO EXTENDED STEAM PIP-  
ING** with danger of leakage  
and freezing

**JUST A BLOWER and A  
STEAM COIL CEN-  
TRALLY LOCATED**



**Both Systems are in Use on the Leading  
Street Railway Lines in this Country and Canada**

**B. F. Sturtevant Co.** BOSTON  
MASS.

NEW YORK

PHILADELPHIA

CHICAGO

LONDON

260

# CRANE VALVES

In brass and iron, for 100 lbs., 250 lbs. and 800 lbs. pressures, in globe, angle, gate, etc., patterns. Iron gate valves for 150 lbs. steam pressure.

# CRANE FITTINGS

In malleable and cast iron, for all pressures—flanged fittings, long sweep fittings, car heater, special tested air brake, and brass fittings.

CRANE STEAM SPECIALTIES. TOOLS. WROUGHT PIPE.

Complete piping equipments for power plants, from drawings, cut, fitted and tested, ready for erection, a specialty.

WRITE FOR POCKET CATALOGUE.

NEW YORK  
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KANSAS CITY  
SIOUX CITY  
OMAHA

## CRANE CO.

CHICAGO

ESTABLISHED 1855

ST. PAUL  
ST. LOUIS  
LOS ANGELES  
SAN FRANCISCO  
PORTLAND, ORE.

ALL SIZES OF IRON, STEEL, BRASS AND COPPER, PIPE BENDING.

FOR ANY SERVICE VALVES AND ALL PRESSURES

CASTINGS IN ALL METALS

HIGH PRESSURE PIPING FOR POWER PLANTS

BEST MANUFACTURING CO. PITTSBURGH, PA.

BURRELL & FOHLE - CHICAGO





## VALVES

For STREET RAILWAY  
**POWER PLANTS**

We make a specialty of  
**VALVES FOR HEAVY PRESSURES**

A large assortment carried at our New York warehouse.

CATALOGUE SENT ON APPLICATION.

**THE KENNEDY VALVE MFG. CO.**

65 BEEKMAN ST., NEW YORK CITY.

### McKim Seamless Copper Ferrules

Made of pure Lake Superior Copper, double annealed, true to gauge



"The Best Is Always The Cheapest"

The McKim Gasket is also the best Gasket. You should know about these good things. Send for Catalogue.

**McCord & Company** 1480 Old Colony Bldg., Chicago.  
1925 American Surety Bldg., New York.

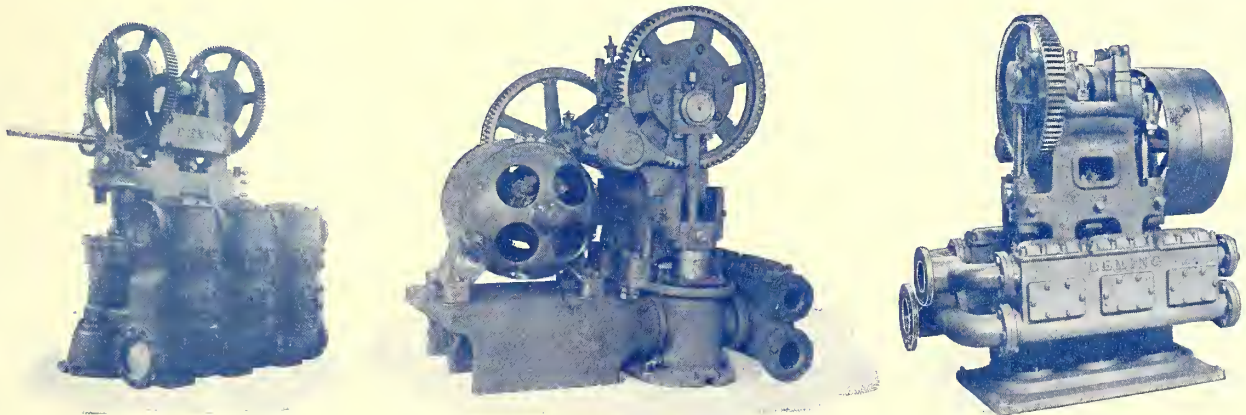
# Pumping Economy

In the Electric Railway Power Station

IS ATTAINED BY USING

## DEMING TRIPLEX PUMPS

Built in many types and sizes, operated by any power. Can be direct connected to Electric Motor or Gas Engine. They are the acme of efficiency.



Catalogue and Price List on application ✕ ✕ List of users is large, varied and prominent.

## THE DEMING COMPANY

Salem, Ohio.

### GENERAL AGENCIES:

HENION & HUBBELL, Chicago.

W. P. DALLETT, Philadelphia.

CHAS. J. JAGER & CO., Boston.

SYDNOR PUMP & WELL CO., Richmond.

HARRIS PUMP & SUPPLY CO., Pittsburgh.

SELIG, SONNENTHAL & CO., LONDON.

THE ENGLISH SUPPLY & ENGINE CO., Kansas City.

THE HENDRIE & BOLTHOFF MFG. & SUPPLY CO., Denver.

LEVI BOOTH & SONS, Los Angeles.

HENSHAW, BULKLEY & CO., San Francisco.

MITCHELL, LEWIS & STAVAR CO., Seattle.

SCHAEFER & GREGORY, New Orleans.

EXPORT OFFICE: 56 PINE STREET, NEW YORK.

**T**HAT very hot water going into the boilers saves repairs, and that very hot gases going up the chimney are a serious loss, are self-evident facts. The question as to how to secure hot water and save the loss of fuel has been solved by the production of the perfected



WRITE FOR BOOKLET  
"GREEN'S ECONOMIZER"

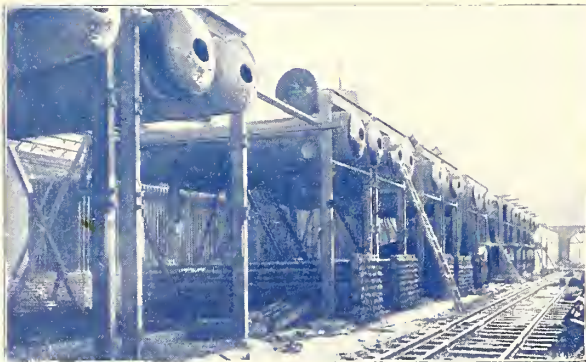


## Green's Economizer

Taking the hot water from the hot well at say 110°, our Economizer will utilize the waste heat in the gases to heat the feed water very considerably above boiling point, enabling you to make your auxiliaries condensing or electric-driven, gaining from 10 to 20% in consumption of fuel, and at the same time always having a reserve of hot water to meet any sudden demand for power.

In electric light, power, supply and traction plants, this saving is particularly demonstrated. The economizer can be applied to any type of boilers without stoppage of the plant. Complete plants installed with different systems of draft.

We are equipping the largest electric power plants to-day with our Economizers, and also some of the smallest. Can you afford to lose 10% in fuel when your competitors are making that gain by using **Green's Economizer.**



**The Green Fuel  
Economizer Co.**

**MATTEAWAN, N. Y.**

**Sole Manufacturers in the U.S.A.**



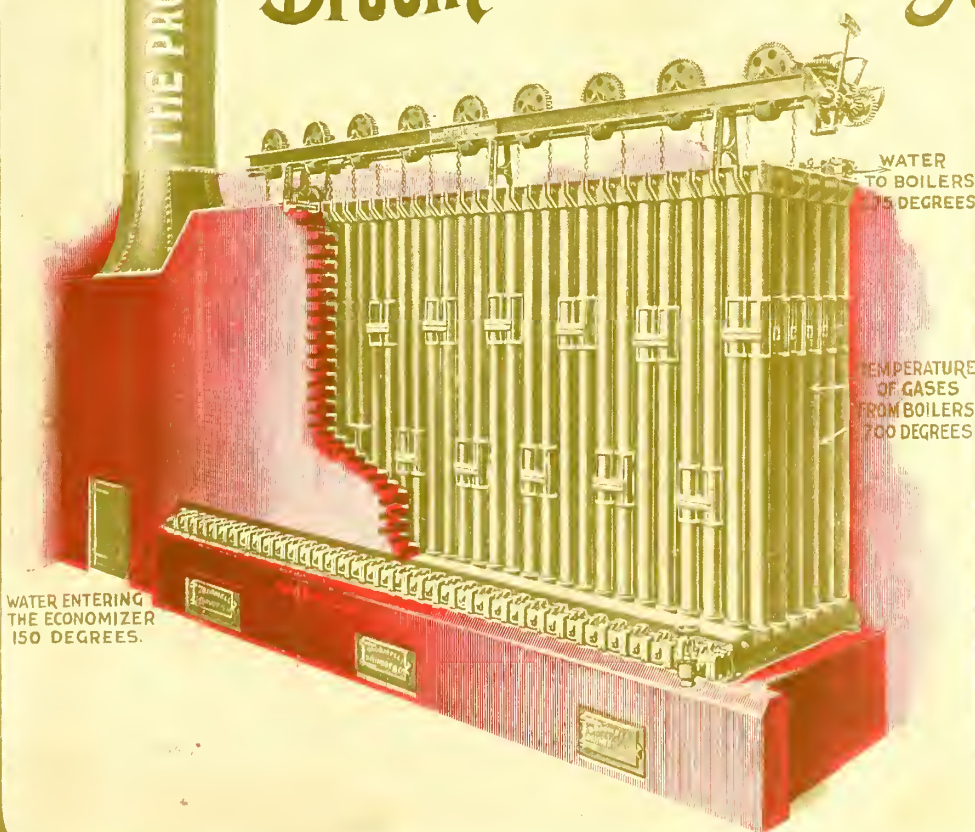
TEMPERATURE  
AFTER LEAVING ECONOMIZER 300 DEGREES

THE PROFITS ARE NOT ALL GOING OUT OF THIS STACK

# "AMERICAN" FUEL ECONOMIZER

(Bromell's Patents)  
(Burpee's Patents)

Manufactured by  
**Bromell, Schmidt and Steacy Co.**  
York, Pa.



An economizer is the fly wheel of a boiler plant, carrying the boilers past the dead centres of unexpected heavy calls for steam, cleaning fires, temporary repairs, etc. A large body of very hot water always ready for use is of great advantage in keeping regular steam pressure. Boilers are supplied with purified water, fewer boilers are required and much less repairs—all from waste heat.

A boiler plant equipped with a good-sized American Economizer may be likened unto a steam engine having a big heavy fly wheel and bearings of ample proportions. The fly wheel will carry it along with a regular speed regardless of sudden changes in load and the large bearings never heat.

# THE AMERICAN STOKER COMPANY...

Sole Owners  
of the  
Controlling Patents  
for the  
**Underfeed System**



MORE THAN 500,000 HORSE POWER IN USE IN ALL CLASSES OF STEAM PLANTS  
ECONOMY AND SMOKE PREVENTION GUARANTEED

*Customers guaranteed from any loss by reason of patent litigation arising from the use of  
stokers purchased from—*

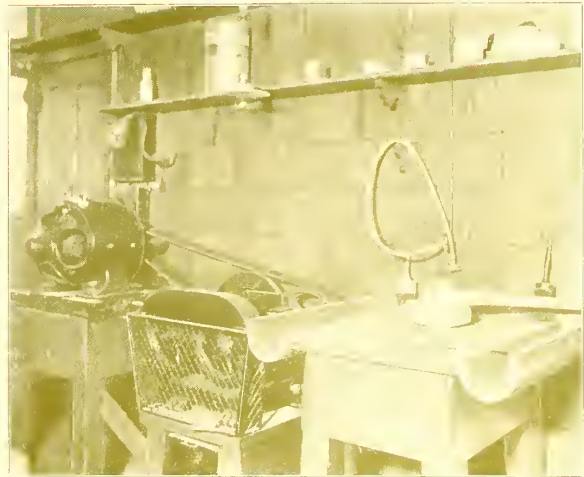
## THE AMERICAN STOKER COMPANY

American Home Office  
11 Broadway, NEW YORK, N. Y.



European Home Office  
31 Walbrook, LONDON, E.C., ENG.

*Estimates furnished for the Equipment of Plants.*

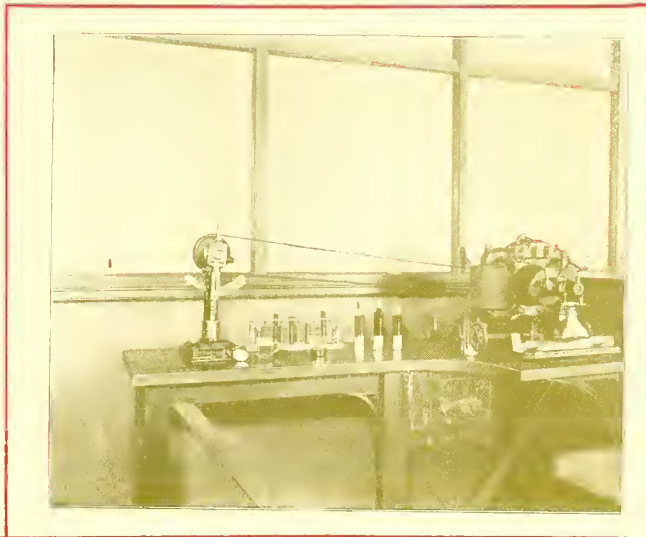


# DEARBORN BOILER COMPOUNDS

Are  
    **Made Right**  
    **Sold Right**

When  
    **Used Right**

Results  
    **Are Right**

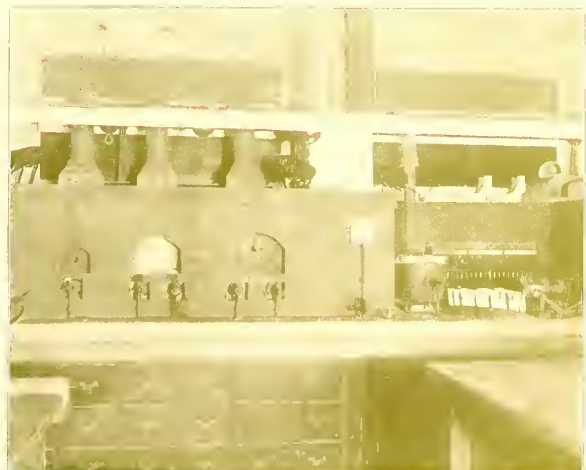


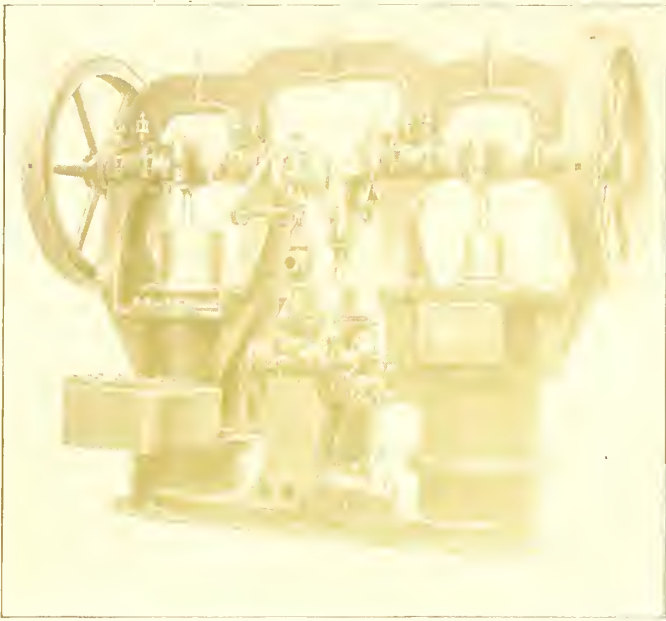
**Water Chemists**  
**General Chemists**  
**Oil Chemists**

**RIALTO BUILDING**  
**CHICAGO**

Branch Offices:  
    New York  
    Pittsburg  
    St. Louis  
    Denver  
    St. Paul  
    San Francisco and  
    Honolulu

# DEARBORN DRUG & CHEMICAL WORKS





# CONOVER CONDENSERS

THE ONLY CONDENSERS SOLD UNDER

## A DUTY GUARANTEE

We are often asked what we mean by "DUTY GUARANTEE."

We mean that we GUARANTEE the number of POUNDS of STEAM per hour required to operate our condenser.

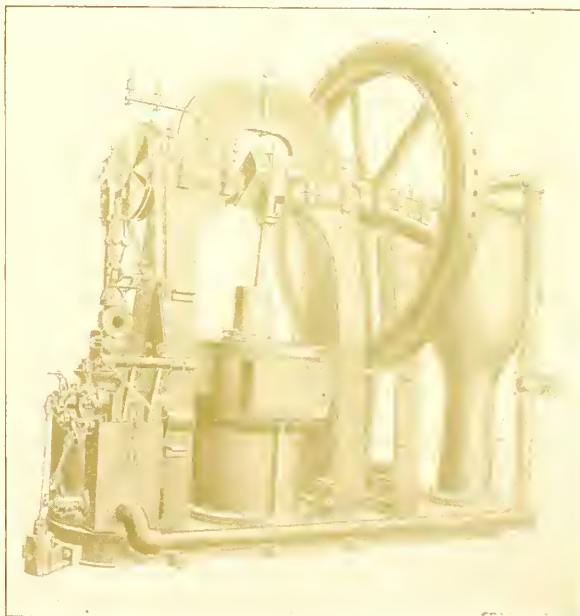
As our steam consumption is about one quarter of the amount used by other types, we think.

This Guarantee

Our Customers Say It

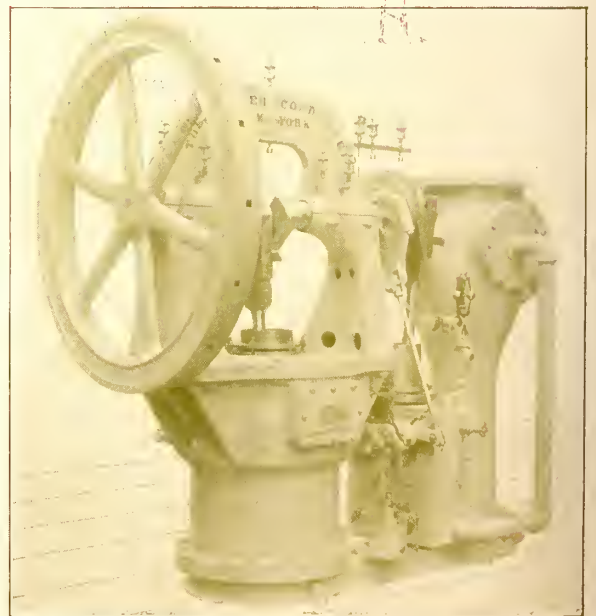
### Cuts Ice

### Cuts Coal Bills



THE  
CONOVER  
MFG. CO.

26 CORTLANDT ST.  
NEW YORK



STRAIGHT TUBES CURVED TUBE PLATES FREE EXHAUST



THE GOUBERT WATER FEED HEATER

USED IN MOST OF THE LARGEST STREET RAILWAYS SIZES 50 TO 5000

EASILY CLEANED DURABLE

AND ELECTRIC PLANTS IN THE COUNTRY HORSE POWER

THE GOUBERT MFG. CO. 85 LIBERTY ST. NEW YORK

TO OBTAIN DRY STEAM



USE STRATTON SEPARATOR

STEAM PIPE

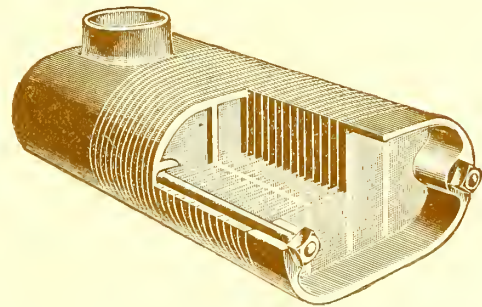
THE GOUBERT MFG. CO. 85 LIBERTY ST. NEW YORK

The Best Diagnosticians Prescribe

# The Potter Mesh Separator and Superheater

DRY STEAM  
TRADE MARK

FOR



**Absolutely dry steam at BOILER OUTLET. Preventing boilers from "throwing water."**  
**Preventing damage to engines. Reducing condensation in steam engines to a minimum.**

THE PATERSON & PASSAIC GAS AND ELECTRIC CO.,  
 PATERSON, N. J., September 3d, 1901.

JAMES BEGGS & COMPANY, New York City, N. Y.

Dear Sirs: Referring to your communication of the 30th ulto. in reference to the installation of "Potter" Separators on our boilers, I beg to say that prior to this installation, which embraces 3,000 H. P. of boilers, we were annoyed to a very considerable extent with water in our engines, calorimeter tests showing the percentage of moisture ranging from 1½ per cent. to 4 per cent. The range at present is .6 per cent. to .9 per cent.—the latter record I think speaks for itself.

Yours very truly,

Wm. M. Brock, Supt. Elect. Dept.

Adapted to any type of Boiler, Stationary or Marine.

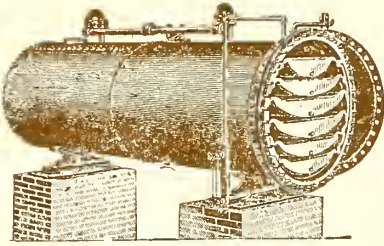
In Use in THOUSANDS of HORSE POWER of Boilers.

Catalog No. 28-B explains it

**JAMES BEGGS & CO., 9 Dey St., New York, N. Y.**

# HOPPE'S Live Steam Feed-Water PURIFIERS Exhaust Steam Feed-Water HEATERS

Our Purifiers are guaranteed to keep boilers clean, using any kind of water.  
The Heaters will heat feed-water to 210° and catch all solids liberated. . . .



Feed-Water Purifier.

...Hoppes Steam Separators  
and Oil Eliminators are the largest made, and  
separate without friction.

**THE HOPPE'S MFG. CO.**

...51 BELMONT AVE., SPRINGFIELD, O.

WESTERN OFFICE: Security Building, St. Louis.

EASTERN OFFICE: Girard Building, Philadelphia.

FOREIGN OFFICES: 59 City Road, London, E. C., England.



Steam Separator.

STANDARD FORM



Horizontal Style  
for Live Steam

The Baum Separator  
is guaranteed to positively  
separate all moisture and  
water from live steam.

Is guaranteed to thor-  
oughly purify exhaust steam  
by removing all oil, grit,  
dirty water and other ex-  
traneous matter.

Absolute freedom from  
back pressure in operation  
is guaranteed.

## THE BAUM SEPARATOR

Superior in design and  
actual operation, it is pre-  
ferred by all experts in eco-  
nomical steam practice.

Write for Booklet "J,"  
describing apparatus for rail-  
way power plants.



**THE BAUM  
SEPARATOR CO.**  
READING, PA.

STANDARD FORM



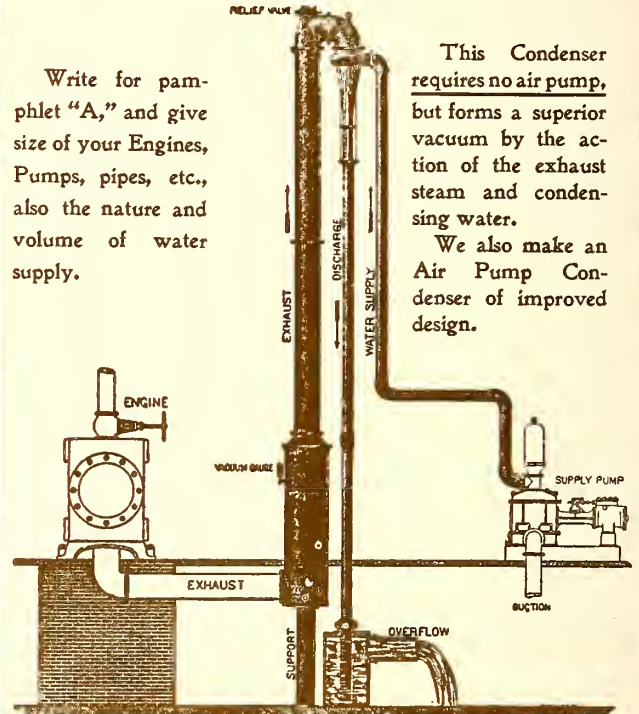
Oil Extractor

## The BULKLEY "Injector" CONDENSER

Write for pam-  
phlet "A," and give  
size of your Engines,  
Pumps, pipes, etc.,  
also the nature and  
volume of water  
supply.

This Condenser  
requires no air pump,  
but forms a superior  
vacuum by the ac-  
tion of the exhaust  
steam and conden-  
sing water.

We also make an  
Air Pump Con-  
denser of improved  
design.



**HENRY W. BULKLEY,**  
New York Office,  
145 Broadway.  
**Orange, N. J.**

# SIEGRIST SYSTEM,

AUTOMATIC LUBRICATION----PATENTED.

THE GREAT OIL AND LABOR SAVER. PAYS A BIG INTEREST ON THE IN-  
VESTMENT. NOT AFFECTED BY HEAT OR COLD. PLENTY OF OIL UNDER  
ALL CONDITIONS.

OWNERS AND CONSULTING ENGINEERS ARE INSTALLING IT ALL OVER THE WORLD.

A LIST OF USERS FURNISHED  
BY ADDRESSING

**SIEGRIST LUBRICATOR CO. ST. LOUIS, MO., U. S. A.**

# The Filter For the Oiling System.



The Cross Oil Filter is made in every style and capacity to meet your needs. Its durability, finish and the guaranteed saving of 50 per cent. on your oil bills make it the practical, profitable one for the oiling system.

Be sure your contractor or engineer installs the Cross Oil Filter.

**The Burt Mfg. Co.,**  
Akron, Ohio, U. S. A.

Largest Manufacturers of Oil  
Filters in the World.

We also make the  
Burt Exhaust Head.



## Some Leading European Manufacturers

...OF...

**ENGINES, BOILERS, PUMPS,  
CONDENSERS AND OTHER  
STEAM PLANT EQUIPMENT**

- Alley & McLellan, Glasgow, Scotland
- Alphons Custodis Chimney Construction Co., Sheffield, Eng.
- Aiton & Co., London
- Babcock & Wilcox, Ltd., London
- Blackwell & Co., Ltd., Robert W., London
- British Westinghouse Electric & Mfg. Co., Ltd. London
- Davey, Paxman & Co., Colchester, Eng.
- Dick, Kerr & Co., London
- Edwards Air Pump Syndicate, London
- Luke & Spencer, Broadheath, near Manchester, Eng.
- Maguire & Baucus, London
- Mather & Platt, Ltd., Manchester, Eng.
- Mirrlees-Watson Co., Ltd., Glasgow, Scotland
- Musgrave & Sons, Bolton, Lancashire, Eng.
- Rowland & Co., B. R., Ltd., Reddish, near Manchester Eng.
- Scott & Mountain, Ernest, Ltd., Newcastle-on-Tyne, Eng.
- Société Industrielle d'Electricité Procédés Westinghouse, Paris, France
- Sturtevant Engineering Co., London
- Weir, J. & G., Glasgow, Scotland
- Willans & Robinson, Ltd., Rugby, Eng.
- Worthington Pumping Engine Co., London

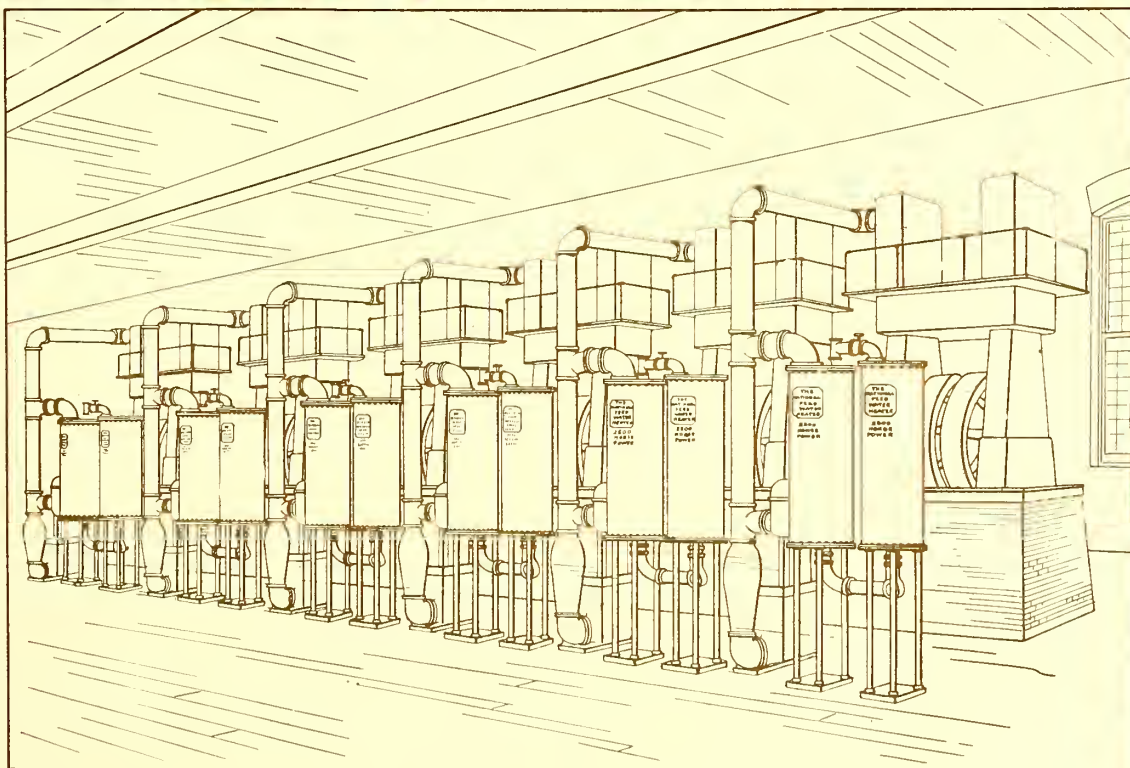
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**30,000 H.P.**

**National  
Feedwater  
Heaters**

**in the**

**Boston  
Electric  
Light  
Station**



**MADE  
BY**

**The National Pipe Bending Co.**

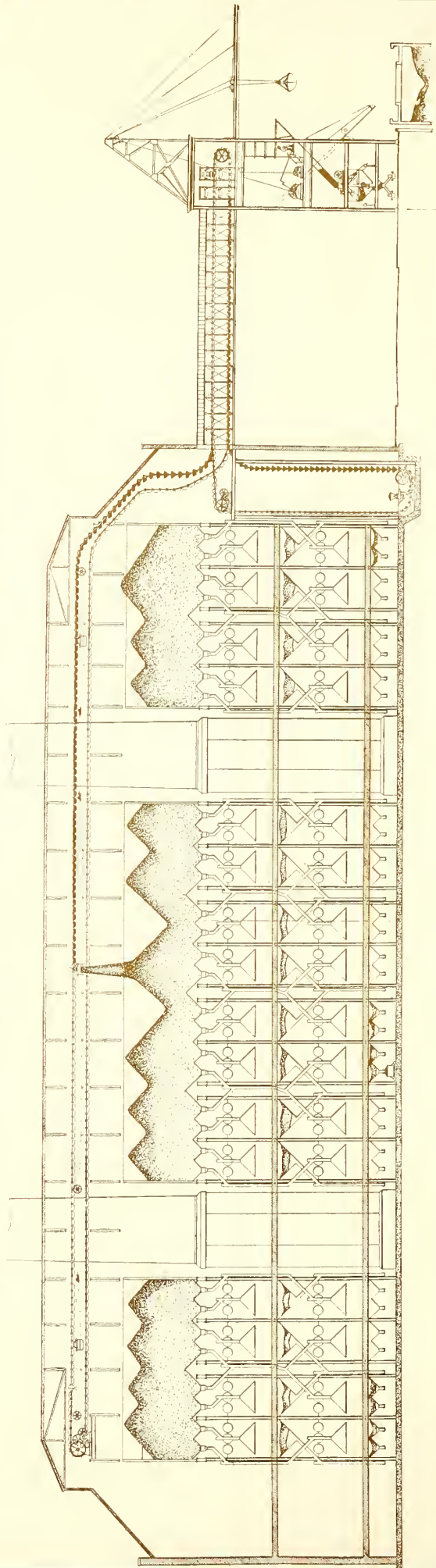
151 LLOYD STREET

NEW HAVEN, CONN.

# JOHN A. MEAD MFG. COMPANY

9 Broadway, New York City

## COAL HANDLING MACHINERY



WE ARE FURNISHING THE ENTIRE COAL AND ASHES HANDLING EQUIPMENT OF THE GREAT STATION OF  
**MANHATTAN ELEVATED RAILWAY, NEW YORK**

We have recently equipped some of the largest Power Stations in the World with McCaslin Conveyors, Crushers and Automatic Shovels, including the stations of

METROPOLITAN STREET RAILWAY CO.	New York City	TOLEDO TRACTION CO.	Toledo
NORTHWESTERN ELEVATED	Chicago	DENVER TRAMWAYS CO.	Denver
MILWAUKEE ELECTRIC RAILWAY & LIGHT CO.	Milwaukee	PRUDENTIAL INSURANCE CO.	Newark, N. J.
CINCINNATI EDISON CO.	Cincinnati	KINGAN & CO.	Indianapolis
ST. LOUIS TRANSIT CO. (3 Stations)	St. Louis	BURFAU ENGRAVING & PRINTING	Washington, D. C.
CHICAGO CITY RAILWAY CO.	Chicago	NEW SOUTH WALES GOVERNMENT RAILWAY	Sidney, Australia
SOUTH SIDE ELEVATED	Chicago	PENINSULAR PORTLAND CEMENT CO.	Woodstock, Mich.
CHICAGO EDISON COMPANY (2 Stations)	Chicago	SANDUSKY	Sandusky, O.
BROOKLYN HEIGHTS R. R. CO. (Kent Avenue Station)	Brooklyn	NEWAYGO	Newaygo, Mich.

Automatic Bucket discharging apparatus and Cable Railways installed for

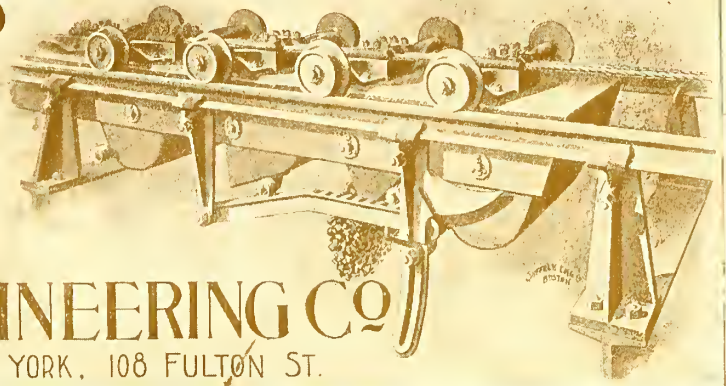
CHICAGO & NORTHWESTERN R. R.	Escanaba, Mich.	DELAWARE, LACKAWANNA & WESTERN R. R.	Chicago, Ill.
"	Ashland, Wis.	C. REISS COAL CO.	Sheboygan, Wis.

AND MANY OTHERS



# COAL AND ASHES

are handled in the best equipped boiler plants by this combined conveyor and elevator system



## STEEL CABLE ENGINEERING CO

BOSTON, 92 STATE ST.

NEW YORK, 108 FULTON ST.

### Coal and Ash Handling Machinery

NEW CATALOGUE JUST ISSUED

Robins Conveying Belt Company

17-21 PARK ROW = = = NEW YORK

**JEFFREY  
COAL-ASHES HANDLING  
MACHINERY.** SEND FOR CATALOGUE.

THE JEFFREY MFG. CO. Columbus, O.

## THE EXETER MACHINE WORKS



Coal, Ash  
and Ore Handling Machinery

for Power Houses, Coaling Stations,  
Coal Yards and Mines.

Hoisting Engines for Contractors, Mines & Quarries

### PITTSTON, PA.

Write for new catalogue "C"

New York Office, 15 Cortlandt St.

### COAL HANDLING MACHINERY

Ashes  
Elevators and  
Conveyors  
Coal Crushers.

For Prices Address...

**THE AULTMAN COMPANY**  
Canton, Ohio.

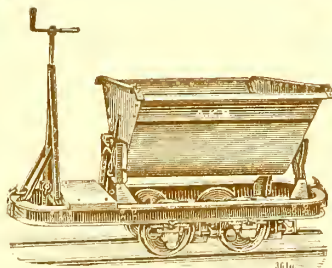
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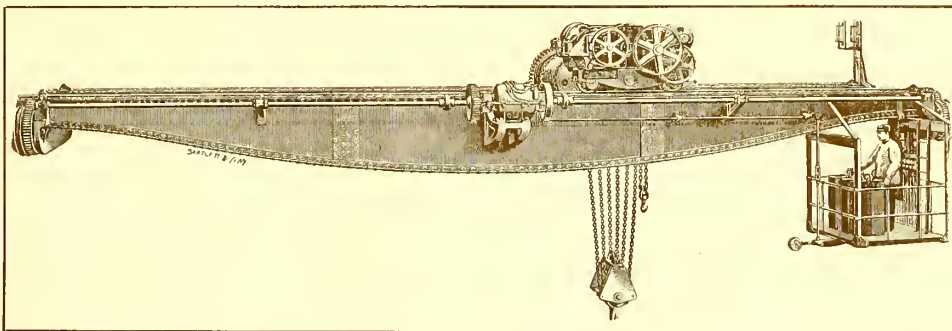
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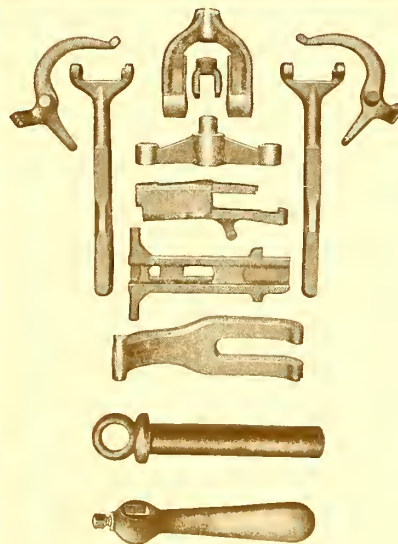
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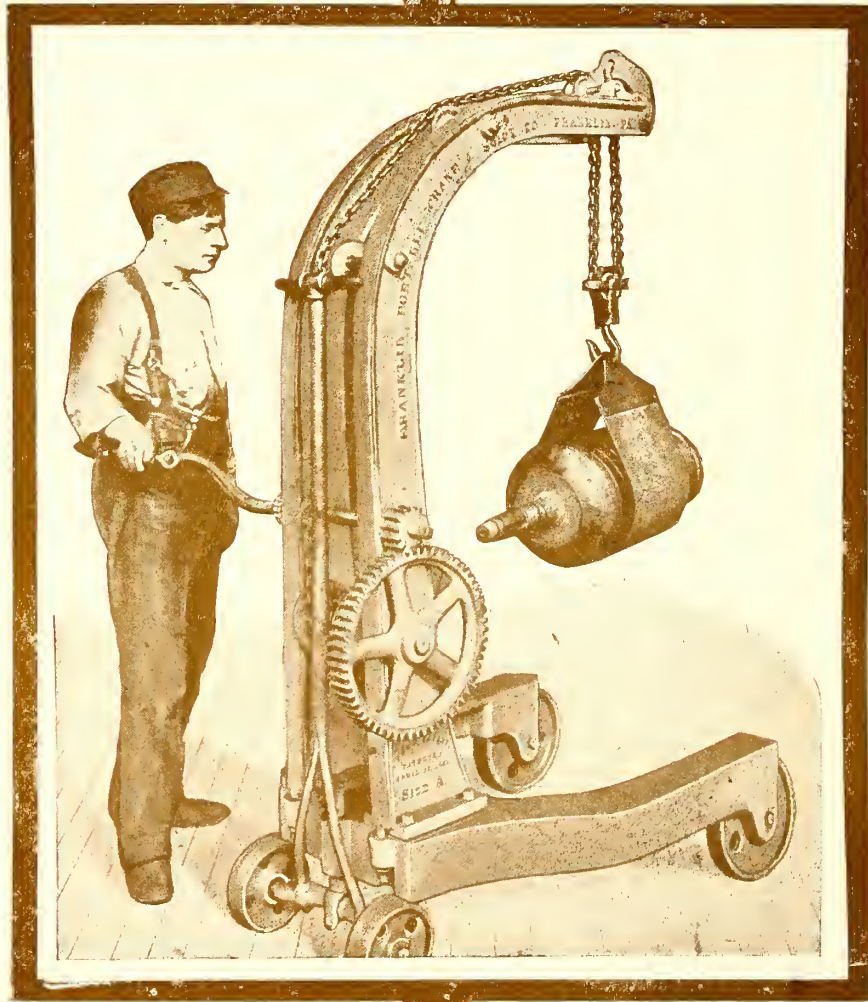
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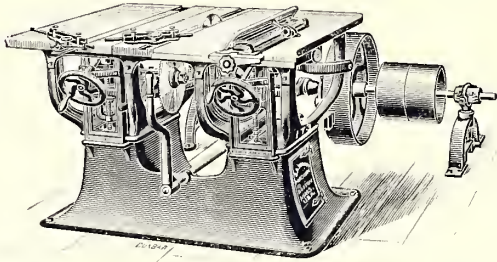
This cut shows their No. 2 stock. They make them in various sizes, cutting threads from 1-8 inch to 4 inches



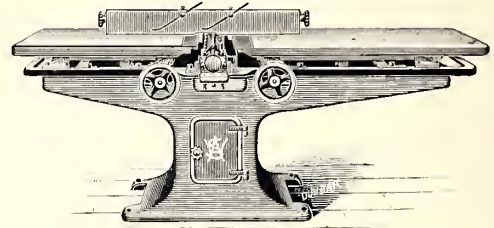
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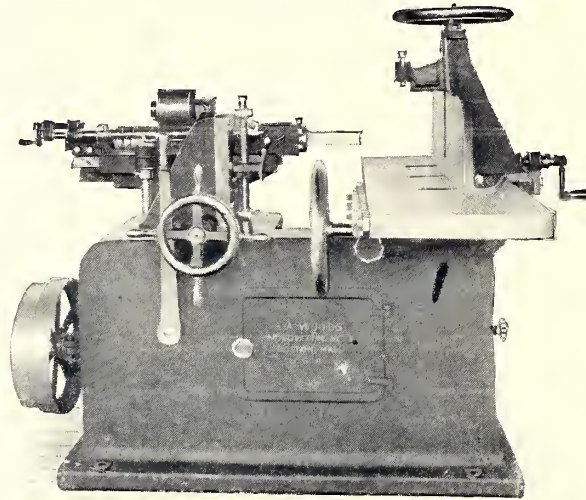


No. 173. Double Iron Saw Bench with Friction Countershaft.



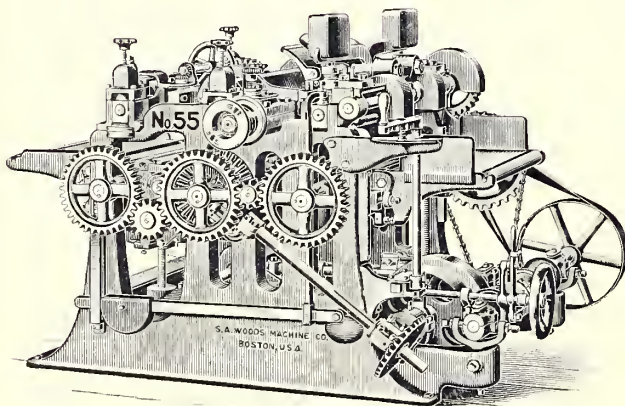
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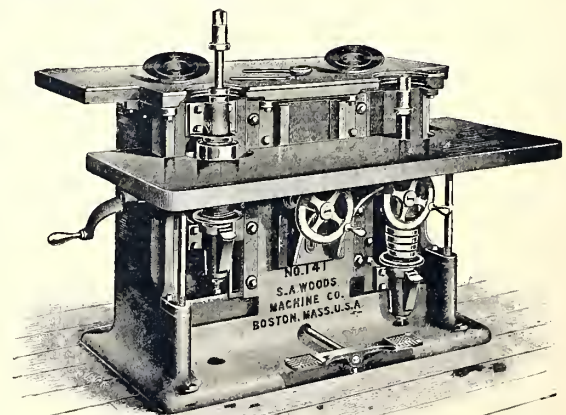


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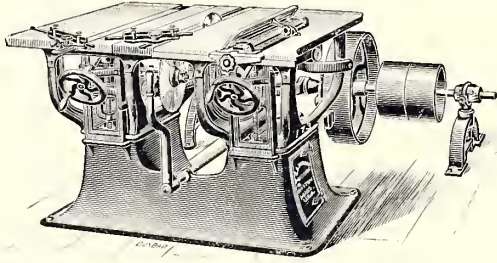


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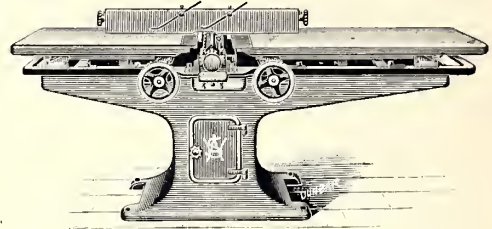
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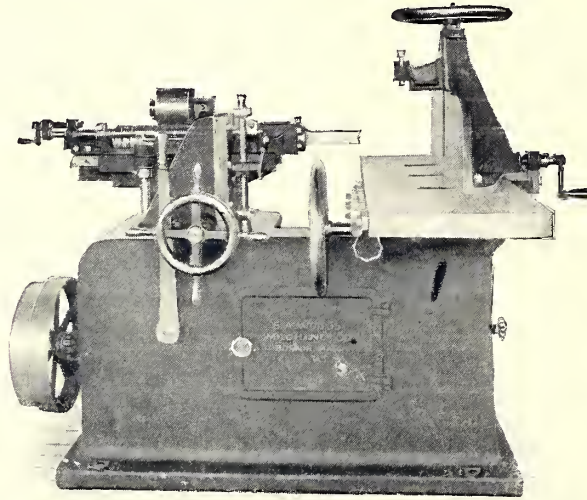
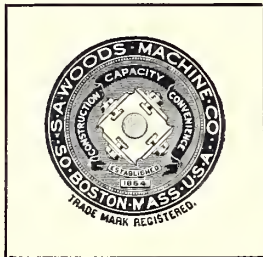


No. 173. Double Iron Saw Bench with Friction Countershaft.



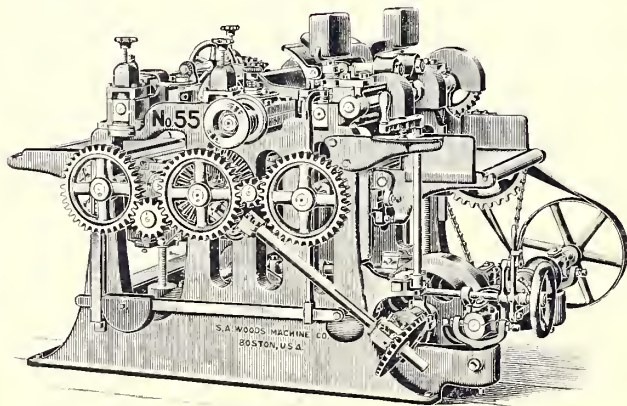
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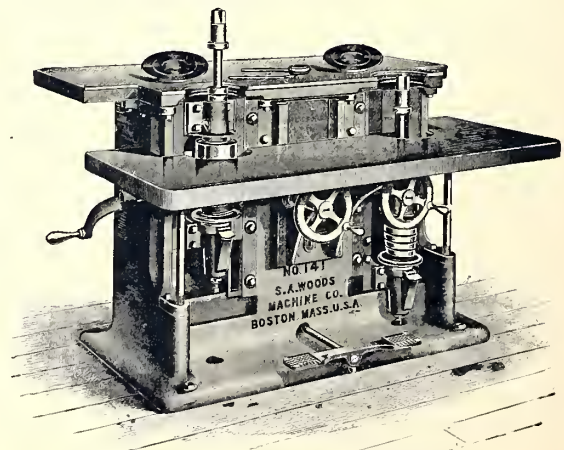


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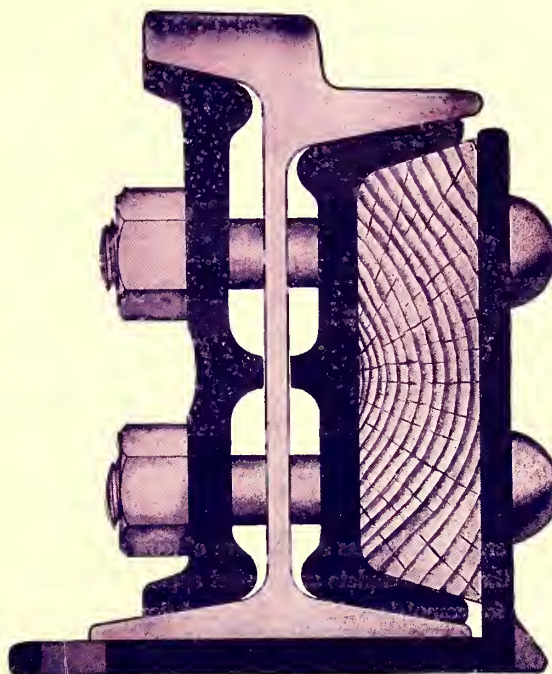
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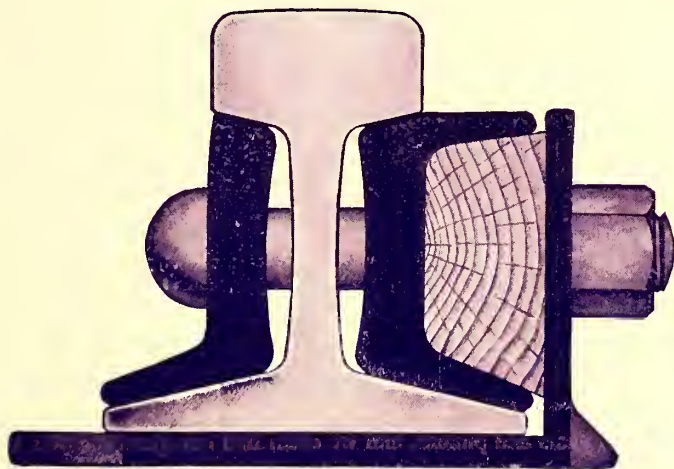
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GIRDER RAIL JOINT



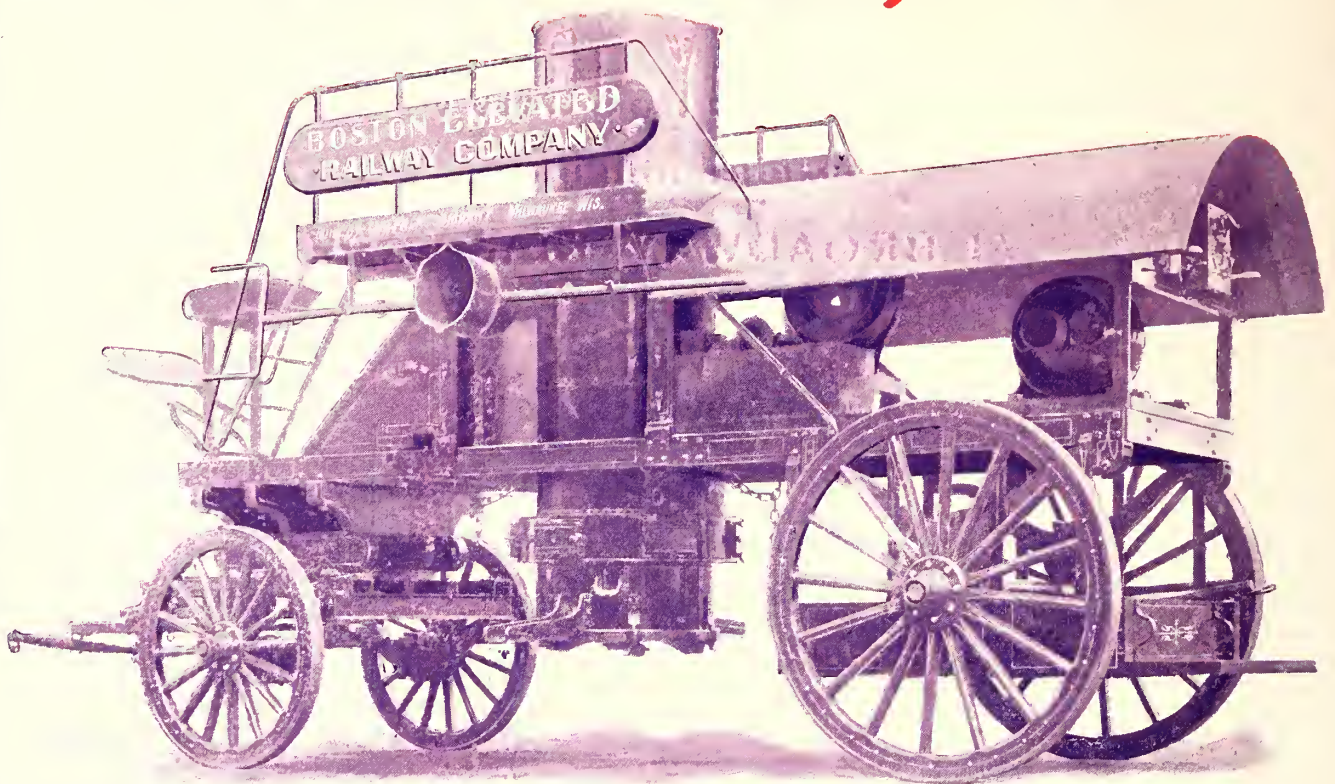
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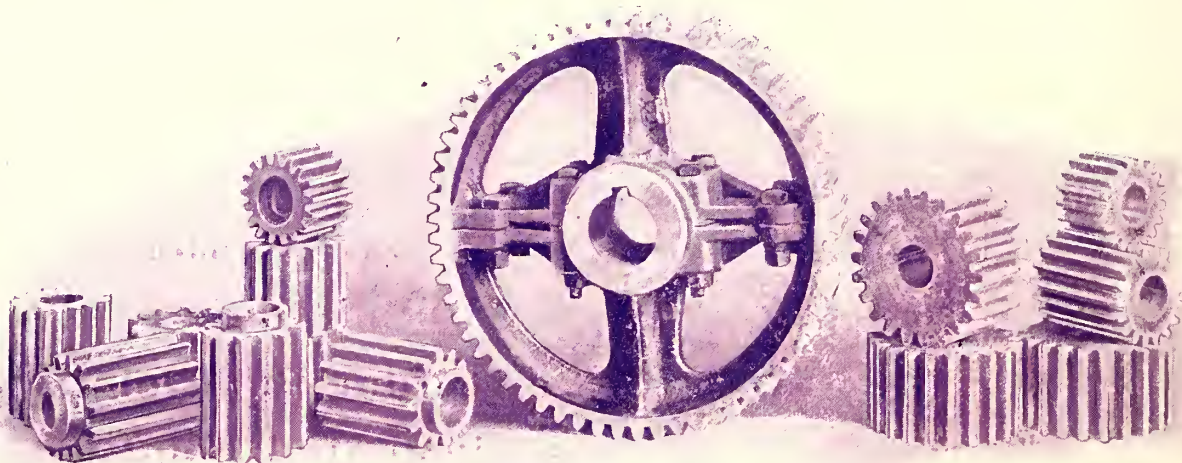
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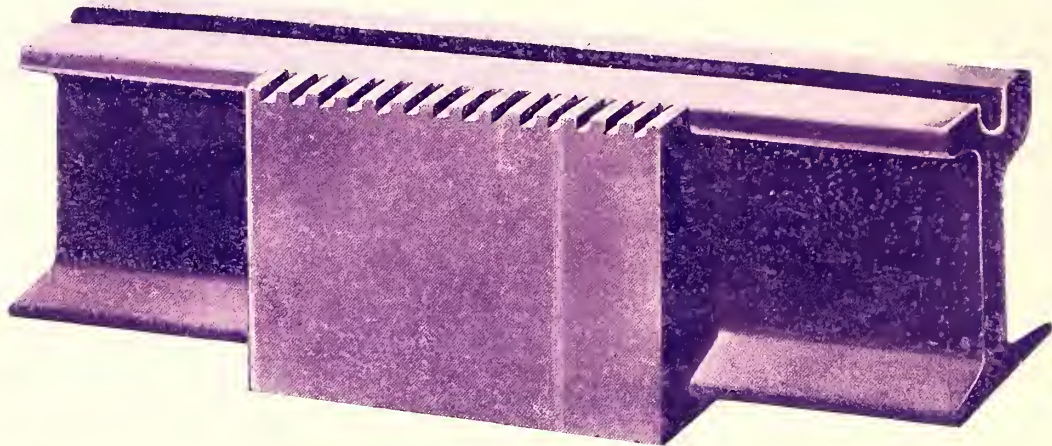
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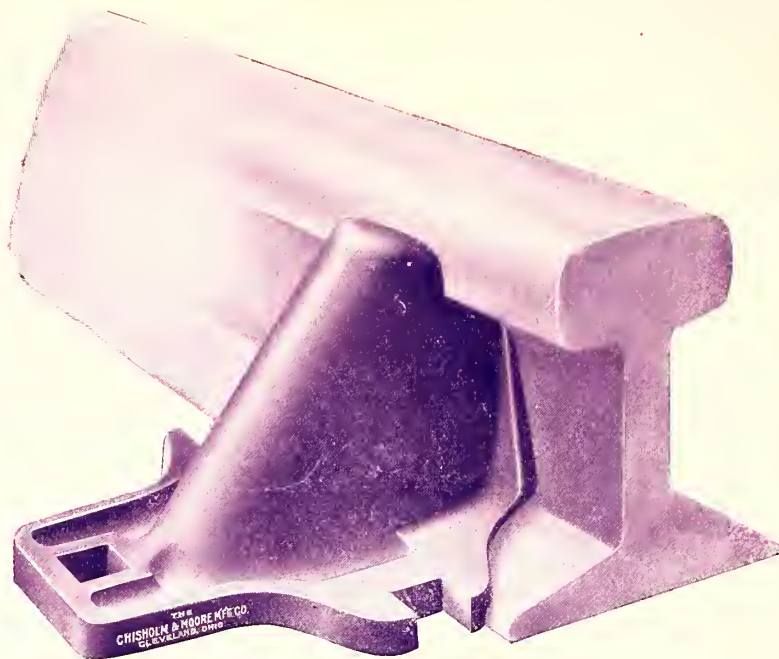
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REPRESENTATIVES:  
WESTERN ELECTRICAL SUPPLY CO.,  
ST. LOUIS, MO.



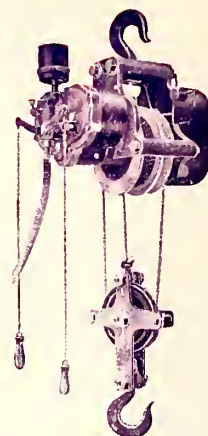
R. J. O'HARA, Vice-President



DIFFERENTIAL HOIST



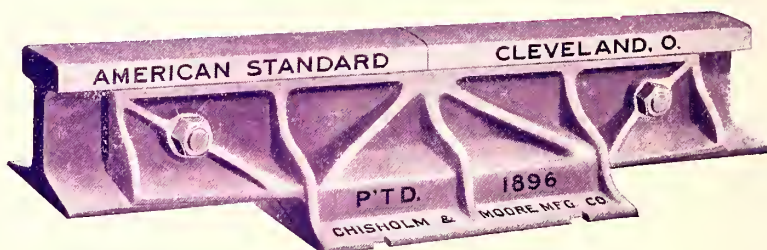
TEE RAIL BRACE



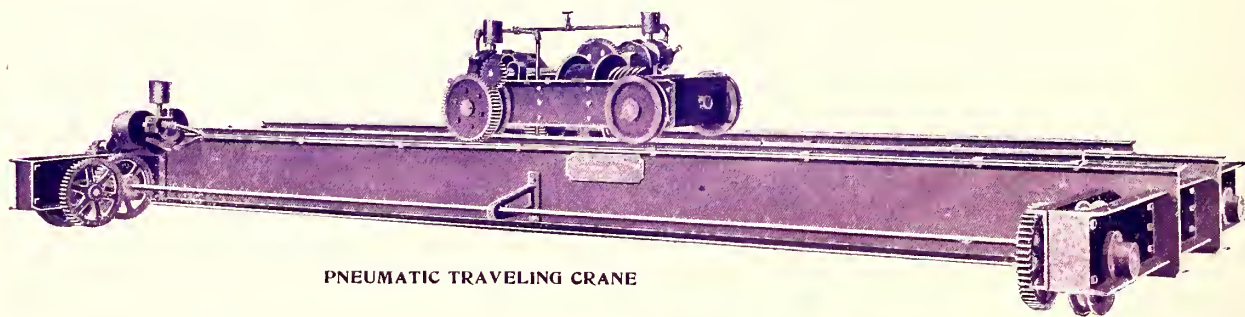
PNEUMATIC HOIST



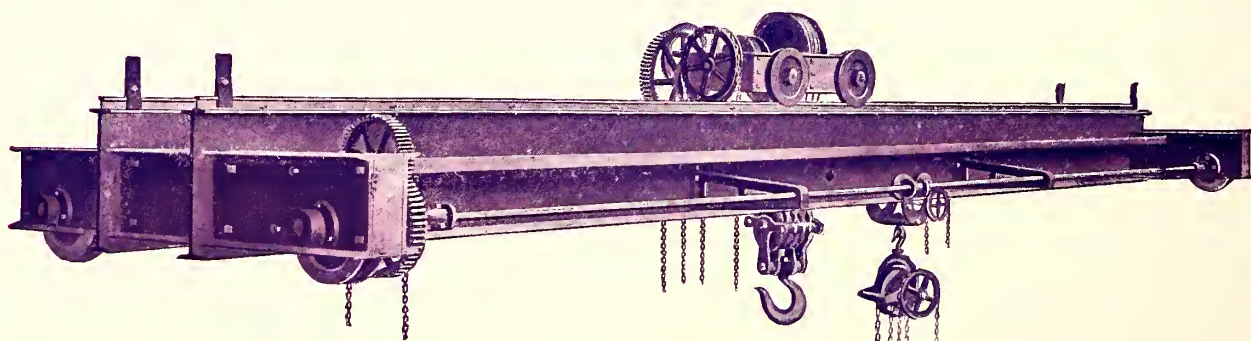
10 INCH JOINT



20 INCH JOINT



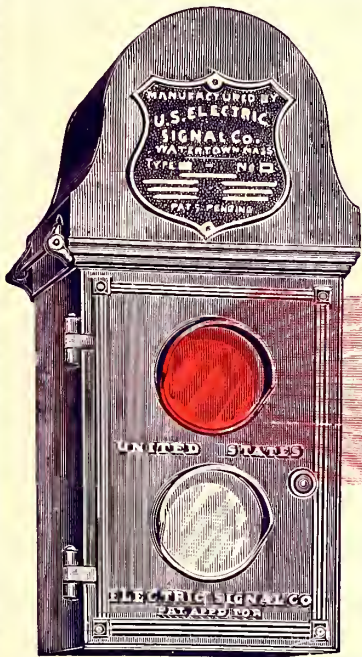
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HAND POWER TRAVELING CRANE

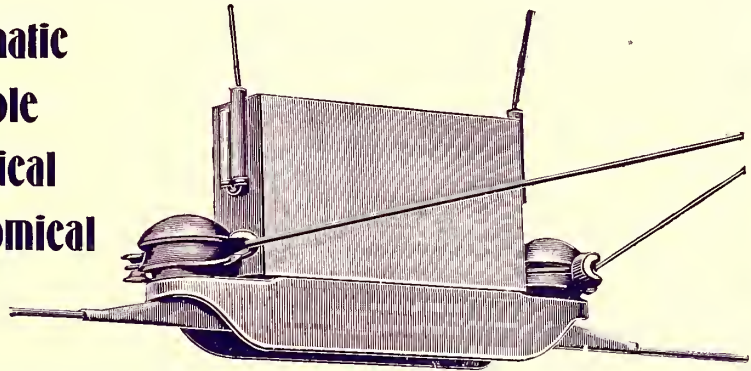
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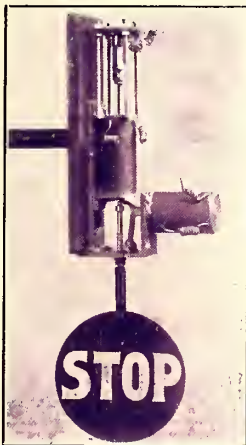
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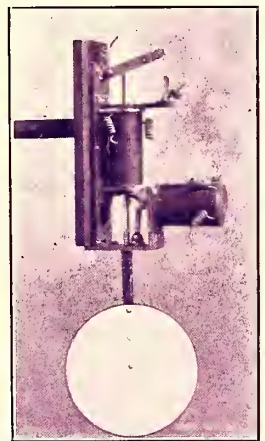
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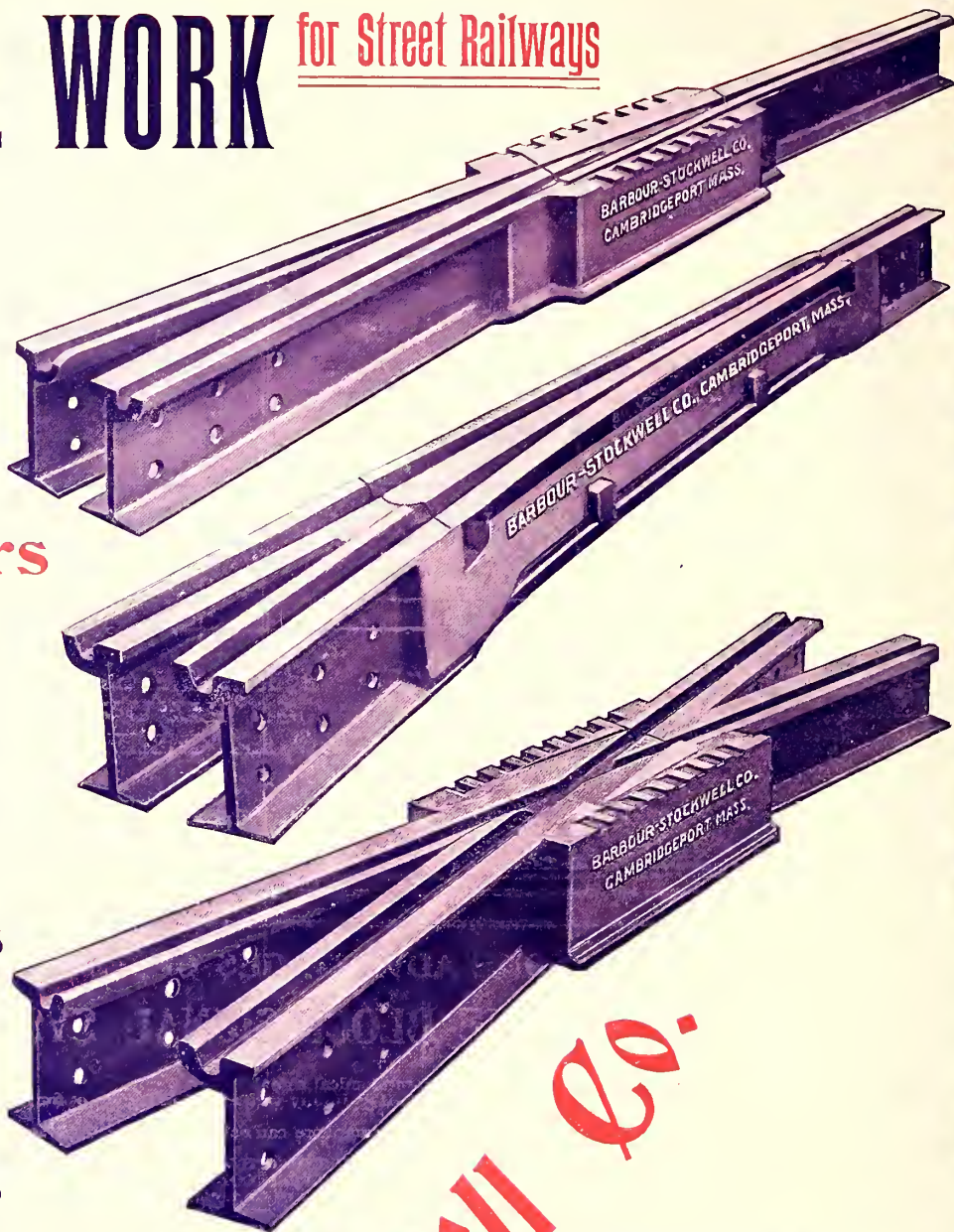
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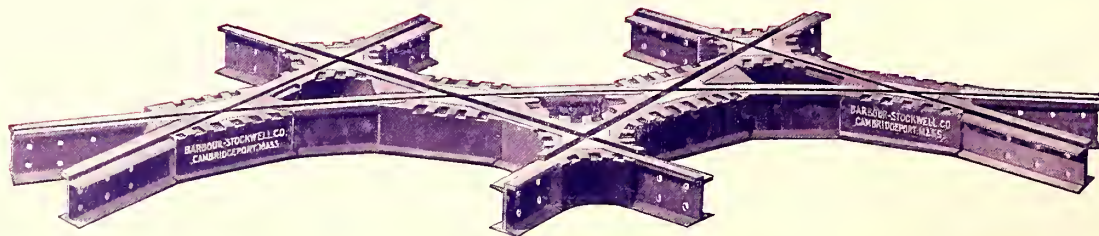
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Railroad  
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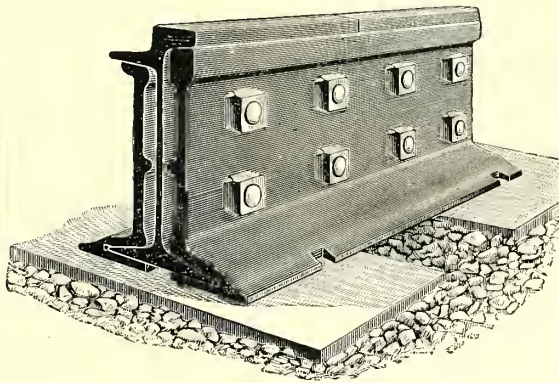
205 Broadway  
Cambridgeport, Mass.



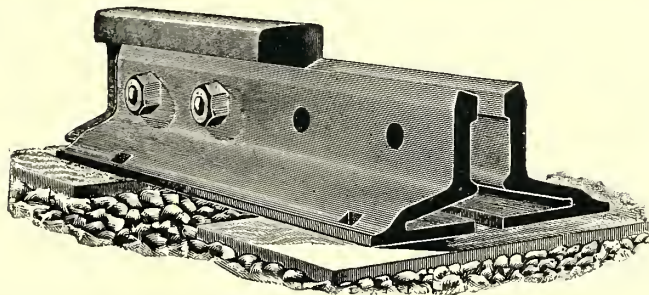
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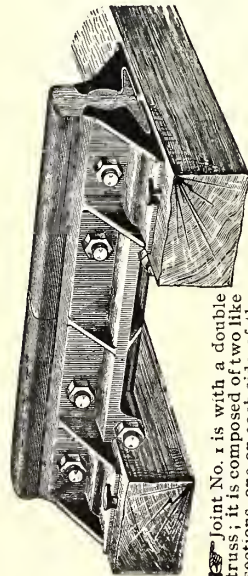
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Over One Million  
in Use.  
No Complaint.

Is Further  
Comment  
Necessary.



Joint No. 1 is with a double truss; it is composed of two like sections, one on each side of the rail, and made to fit any rail or rails.

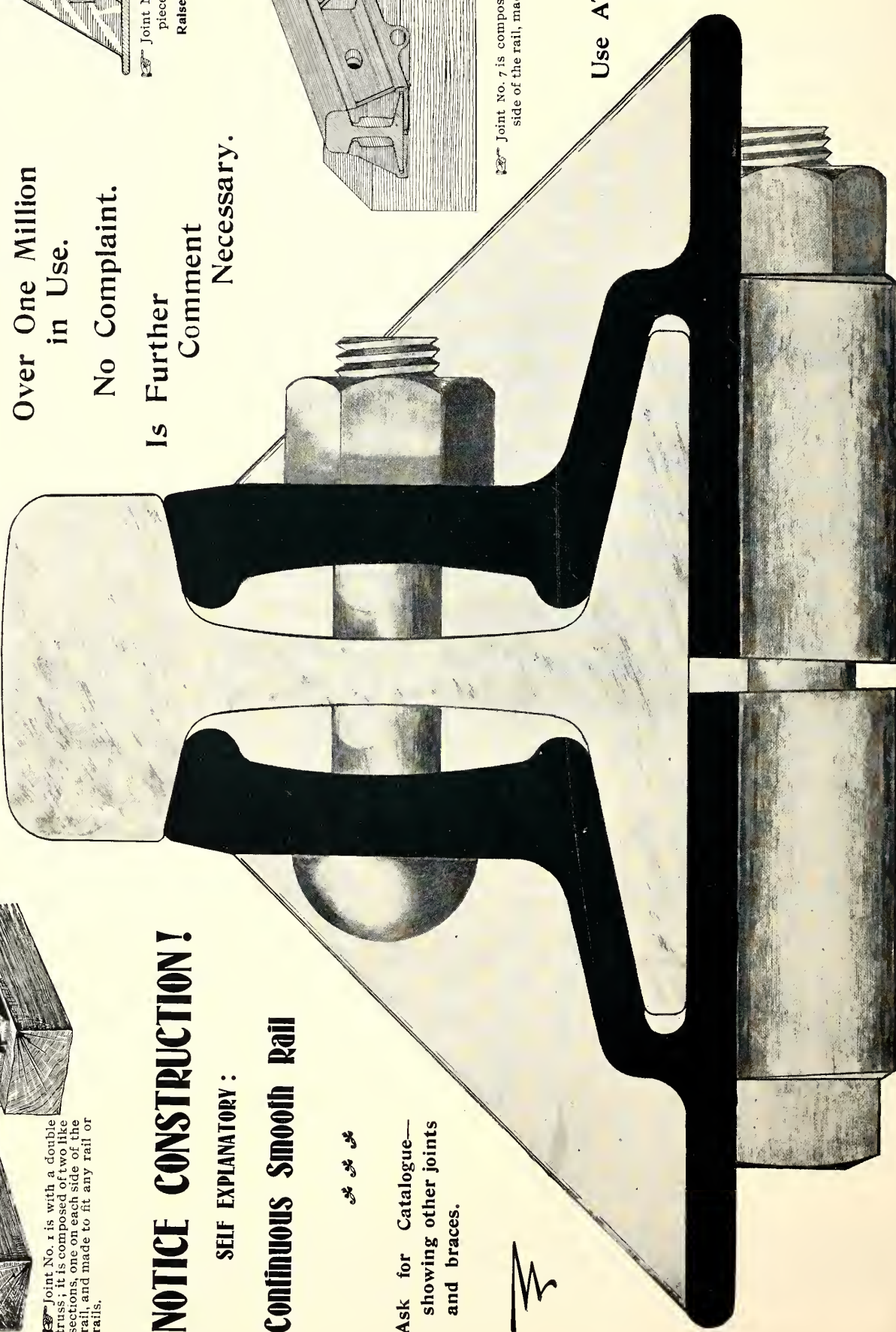
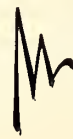
## NOTICE CONSTRUCTION!

SELF EXPLANATORY :

## Continuous Smooth Rail

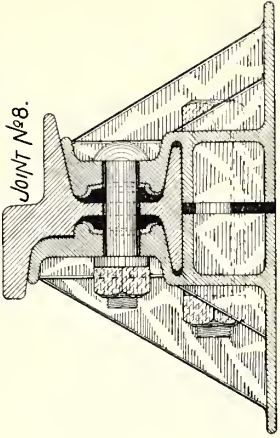
على على على

Ask for Catalogue—  
showing other joints  
and braces.

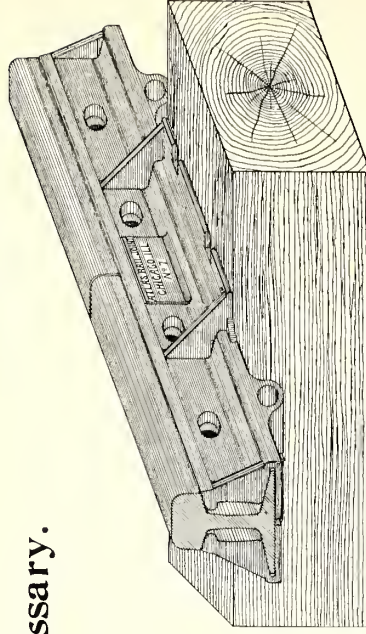


SECTION THROUGH AT TIE PLATE.

For Low Girder Rails

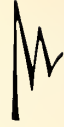


Joint No. 8 with chair composed of only two pieces.  
Raised Brace and Chair in one piece.



Joint No. 7 is composed of two like sections, one on each side of the rail, made to fit any rail or rails.

Use ATLAS PRIMER and  
SURFACER for Cars  
and Locomotives.  
I. X. L. for Wood  
and Iron Painting.



# THE PENNSYLVANIA STEEL CO.

MANUFACTURERS OF

**Steel Rails** OF ALL SECTIONS AND WEIGHTS FOR BOTH  
STEAM AND ELECTRIC RAILWAYS.

**Frogs, Switches,** AND CROSSINGS FOR STEAM RAILROADS

**Special Work** FOR STREET RAILWAYS.

**Bridges.** WE CAN BUILD AND HAVE BUILT THE LARGEST AND HEAVIEST

**Viaducts** FOR STEAM RAILROADS AND ELEVATED RAILWAYS.

**Steel Buildings.** WE CAN FURNISH ALL THE FRAME WORK.

**Steel Castings** OF HIGHEST QUALITY.

**Special Steels** FOR ALL PURPOSES.

CALL ON OR ADDRESS OUR NEAREST AGENT FOR INFORMATION  
AND PRICES.

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Rooms 11-12 Mason Bldg., Chas. S. Clark, Sales Agt.  
BALTIMORE AGENTS,  
R. C. Hoffman & Co., Equitable Building.  
ST. LOUIS AGENT,  
Joseph G. Miller, Security Building.

NEW YORK OFFICE,  
Empire Building, S. W. Baldwin, Sales Agent.  
CHICAGO AGENTS,  
Q. & C. Co., Western Union Building.  
SAN FRANCISCO AGENTS,  
George W. Gibbs Co., 33-39 Fremont Street.  
LONDON AGENTS—Sanders & Co., 110 Cannon St.

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**STEELTON, PENNA.**

and SPARROW'S POINT, near Baltimore. Md.

CABLE ADDRESS:

For the Pennsylvania Steel Co., PENNSTEEL, HARRISBURG.

For the Maryland Steel Co., MARYSTEEL, BALTIMORE.

USE "LIEBER'S," "A1," "A B C," or "WESTERN UNION" CODES.—LIEBER'S PREFERRED.

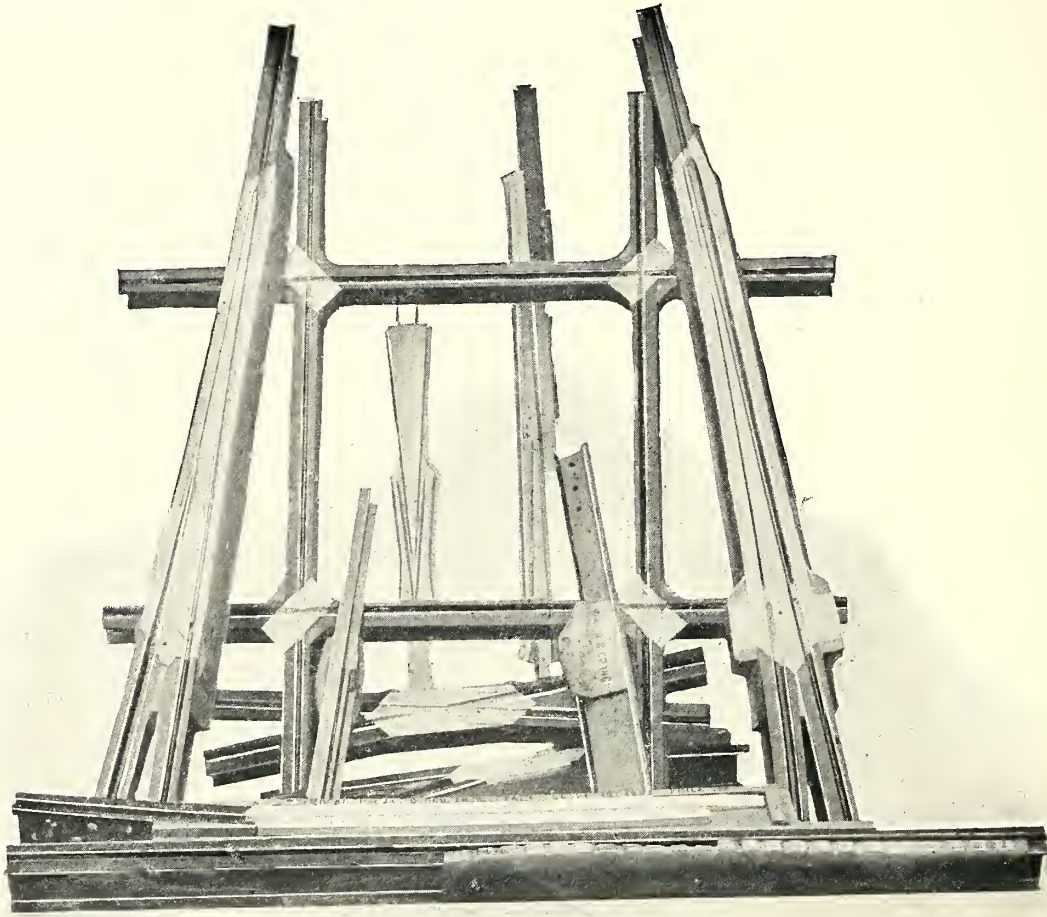
BUSINESS ESTABLISHED IN 1859

AND "IN THE LEAD" IN 1901

# WM. WHARTON, JR. & CO.

PHILADELPHIA, PA.

INCORPORATED

**Girder Rails and Other Rails for Street Railways Complete with Fittings**

## MANGANESE STEEL SPECIAL WORK

ACKNOWLEDGED BY ALL WHO HAVE TRIED IT AT HOME AND ABROAD  
TO BE

### THE BEST AND LONGEST WEARING

WE HAVE THE SOLE RIGHT TO USE MANGANESE STEEL IN TRACK STRUCTURES

**Steam R. R. Special Work, Industrial Railways, Railway Castings  
Brake Shoes, Etc.**

**W**HEN You Visit the Pan-American Exposition,  
We Respectfully Invite a Critical Inspection  
of the Electrically Welded Continuous Track of the  
Buffalo Railway Company.

During the past two years, our Track  
Welding Department has welded a total of  
99½ miles of track in Buffalo, as follows:

NEW TRACK, 9 IN. RAIL, - 34½ MILES OF TRACK  
NEW TRACK, 6 IN. RAIL, - 3½ MILES OF TRACK  
OLD TRACK, 9 IN. RAIL, - 13 MILES OF TRACK  
OLD TRACK, 6, 6¼ and 7 in. RAIL, 48½ MILES OF TRACK

We would call your especial attention  
to the track on Main Street, from  
Niagara Street to the Erie Railroad  
Crossing, a distance of five miles. This  
track, 9 in. rail, 60 foot lengths, rolled by  
The Lorain Steel Company, laid under  
the able supervision of the Buffalo Rail-  
way Company's own Engineers, upon a  
concrete foundation, all the joints elec-  
trically welded, is the embodiment of all  
that is best in modern track construction.  
The perfect track for electric railway  
service. Perfect mechanically, perfect  
electrically, the ideal track realized.

# THE LORAIN STEEL CO.

LORAIN, OHIO.

JOHNSTOWN, PENNSYLVANIA.

## SALES OFFICES:

New York: Battery Park Building.

Pittsburg: Penn Building.

Atlanta: Equitable Building.

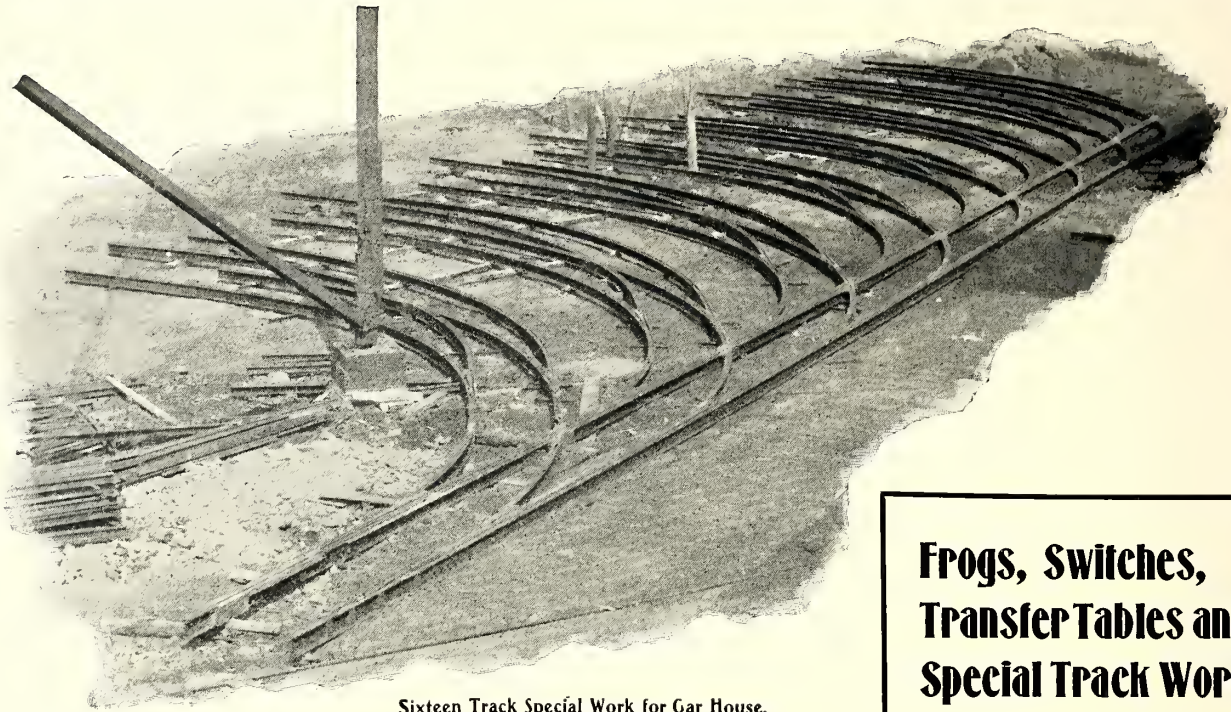
Chicago: Monadnock Building.

St. Louis: Bank of Commerce Building.

# New York Switch and Crossing Company

Cable Address, "Switch, Hoboken."

Hoboken, N. J., U. S. A.



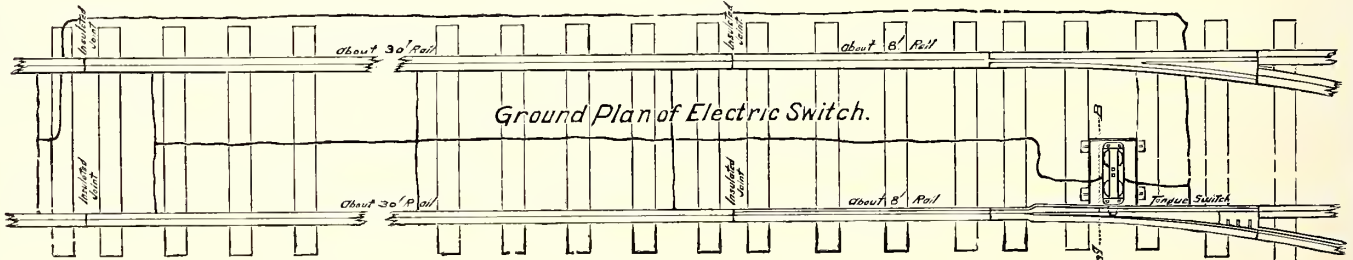
Sixteen Track Special Work for Car House.

**Frogs, Switches,  
Transfer Tables and  
Special Track Work**

## It will Pay you to Investigate our Automatic Electric Track Switch.

THIS switch is thoroughly reliable in operation and will throw the switch point, or not, at the will of the motorman on the car. An electro-magnet is used to move the switch point in either direction. The magnet is located in the return circuit of the motors which propel the car. Every car throws the switch, unless it is in the right position when the car approaches, in which case the current is turned off by the motorman, and the car travels by its momentum over the switch. The track through which the return current flows has an insulated section preceding the switch point connected with the magnets in the switch box (the regular return circuit shunting around).

Fig. 1.



While the car is on this section the motorman can throw the switch point as often as he pleases by repeatedly putting the current on and off. With this switch the road cannot be blocked should the switch fail to operate electrically. The switch point may be moved by hand at any time, and after each operation the parts will be in position to operate electrically. There are no joints to wear. The whole apparatus is enclosed in a strong cast iron box imbedded in the road bed and connected with the sewer. There are absolutely no attachments of any kind placed on the car.

This switch is warranted to fulfill every requirement that can be made of a switch with the same care any switch receives; the weather has no effect on it.

This switch is now in operation on many of the large roads throughout the country.

OUR NEW CATALOGUE IS YOURS FOR THE ASKING



# Automatic Electric Track Switch

Operated and Controlled by the Motorman without extra attachments to car.  
Can be adjusted to any Switch Tongue.

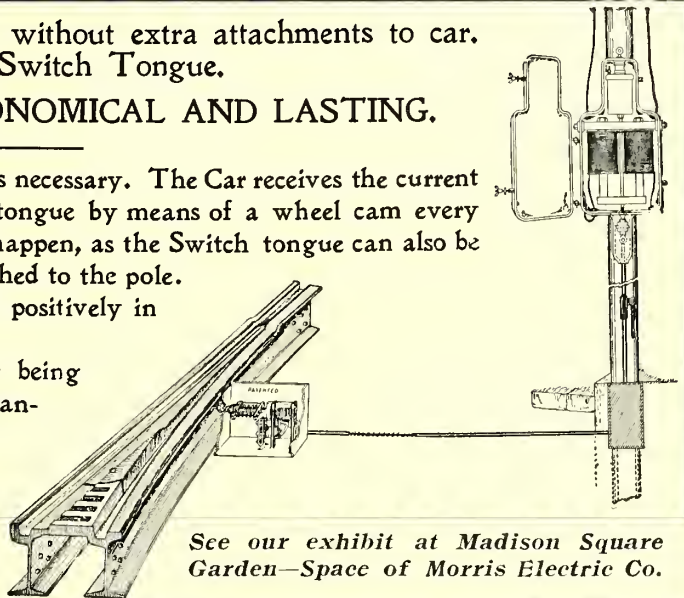
**GUARANTEED SAFE, SURE, ECONOMICAL AND LASTING.**

With this device no insulated section of track is necessary. The Car receives the current through a solenoid coil which throws the Switch tongue by means of a wheel cam every time power is applied. No blocking of cars can happen, as the Switch tongue can also be thrown either with a switch iron or a lever attached to the pole. The mechanism is thoroughly protected and works positively in all kinds of weather.

Our Automatic Switches are in operation or being installed in Pittsburgh, Cincinnati, Boston, Indianapolis and other cities.

*Write for prices and full descriptions.*

We are Manufacturers and Dealers in Automatic, Electrical and Mechanical Switches and Street Railway Supplies of all kinds.



See our exhibit at Madison Square Garden—Space of Morris Electric Co.

## American Electric Switch Company,

308-309-310 Lewis Block, Pittsburgh, Pa., U. S. A.

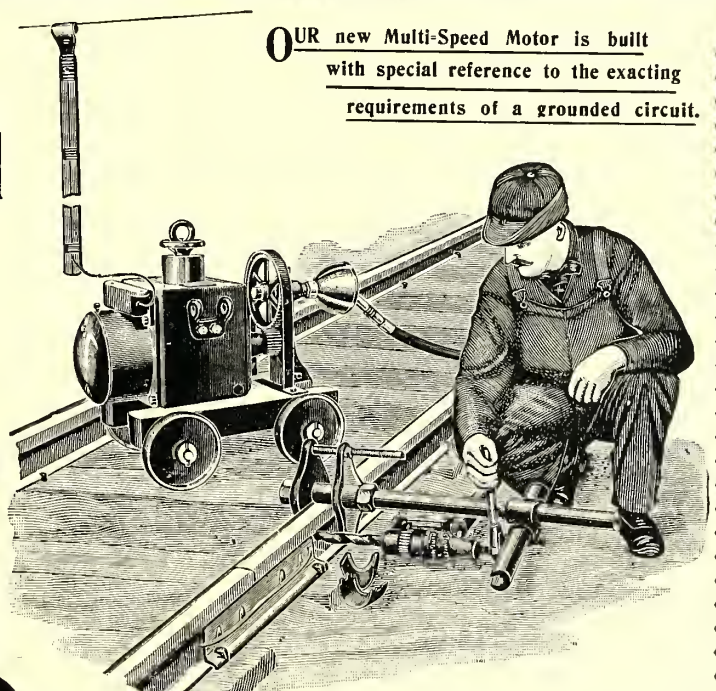
Respass

# Electric Street Railroad Track Drill

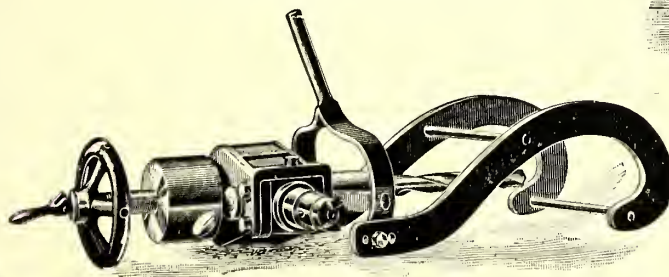


Is it wise economy to go on drilling by hand with a trolley wire just above you? **LOOK UP!**

And write us for prices.



OUR new Multi-Speed Motor is built with special reference to the exacting requirements of a grounded circuit.



THE AUTOMATIC TRACK DRILL (with clamp) is very convenient for quick adjustment.

ESTABLISHED 1875.

**STOW MFG. CO.,** Binghamton, N. Y.

Inventors and largest Manufacturers in the World of the **STOW FLEXIBLE SHAFT FOR ALL PURPOSES.**

Inventors and Sole Manufacturers of the **Ironclad Multi-Speed Electric Motor.**

General European Agents:

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**STEEL ROLLING** DOORS  
 SHUTTERS  
 PARTITIONS  
 Excellent Construction and Trolley Arrangement. **FOR CAR BARN**

CONSTRUCTIONS FOR EVERY PURPOSE,  
 Freight Houses, Round Houses, Warehouses, Business Blocks, Churches.  
 FIRE PROOF. DURABLE. REASONABLE IN COST.  
**THE KINNEAR MFG. CO.,**  
 COLUMBUS, OHIO, U. S. A.

**NEW CASTLE BRIDGE CO.**  
 NEW CASTLE, IND.  
 MANUFACTURERS OF  
**Steel Bridges and Structural Iron Work**  
 Special attention given to the requirements of street and suburban railways  
 Plans and specifications furnished on application. Prompt service guaranteed.

**THE AMERICAN FROG AND SWITCH CO.** Hamilton, Ohio **Special Track Work for Electric Railways**

**RAILS** Joint Fastenings, Tie Rods, Knees, Bolts, Spikes, Etc. Curved Rail and Special Switch and Frog Work a Specialty.  
**HARRINGTON, ROBINSON & CO.,** 276 FRANKLIN STREET BOSTON.

**ELECTRIC RAILWAY SPECIAL WORK,** Frogs, Switches, Curves, Crossings, Rail Braces, Etc.  
**THE WEIR FROG CO.,**  
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**The Elastic Nut Track-Bolt**

makes the best and cheapest rail-fastening. NUTS NEVER WORK LOOSE. Requires no nut-lock. Our Elastic Self-Locking Steel Nut always stays, and is superior for use on Cars, Track, Bridges, Machinery etc. Write us for prices on Sq. and Hex. Nuts, (Elastic or Common) Machine Bolts, Track Bolts, Rivets, etc.  
**NATIONAL ELASTIC NUT CO.,**  
 MILWAUKEE, WIS.

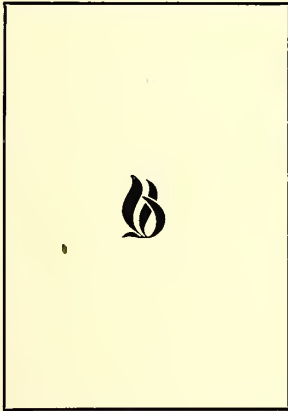
**WHEN WRITING TO ADVERTISERS** in the STREET RAILWAY JOURNAL you will confer a favor on both publisher and advertiser by mentioning this paper.

FOR ADVERTISEMENTS OF  
**POLES, TIES, RAIL BONDS, WIRE, OVERHEAD LINE MATERIAL, ETC.**  
 SEE SECTION VI OF THIS ISSUE

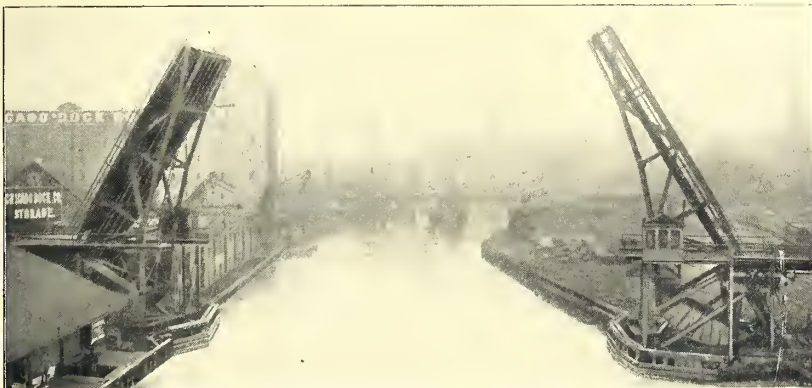
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are invited to call at our offices  
45 Broadway & 196 Aldrich Court Building



**We make a Specialty of Bridges and Steel Structural Work for Street Railway Purposes**



TAYLOR STREET SCHERZER ROLLING LIFT BRIDGE, CHICAGO—OPEN

**T**HE Scherzer Rolling Lift Bridge is rapidly replacing the swing bridge and other forms of movable bridges.

Twenty-seven other large Scherzer Rolling Lift Bridges in successful use and under construction at the present time.

The Scherzer Rolling Lift Bridge forms an artistic and pleasing structure, and fulfills every modern requirement of a movable bridge for

### STREET CAR

highway and railroad traffic.

Preliminary sketches and estimates furnished to responsible parties upon request, accompanied by the necessary data.

**The Scherzer Rolling Lift Bridge Co.**

1616 MONADNOCK BLOCK, CHICAGO

Invented by Wm. Scherzer, C.E.

Patented

DETROIT & NORTHWESTERN RAILWAY,  
717 Hammond Building,  
Detroit, Mich.

MICHIGAN MFG. CO., YPSILANTI, MICH.

Gentlemen:—Replying to your inquiry of the 13th inst., regarding the "Sweet's Track Drill," purchased by the Grand River Electric Railway Co. in 1898, we would beg to state that it has given the very best of satisfaction, and we would recommend it to all prospective purchasers. We are able to do from twice to three times the work with it that we could do with the old style of ratchet drill. We will gladly answer any inquiries regarding same at any time. Wishing you success, we remain,

Very truly yours,  
Detroit & Northwestern Ry.,  
Per F. A. LITTLE, Chief Engineer.

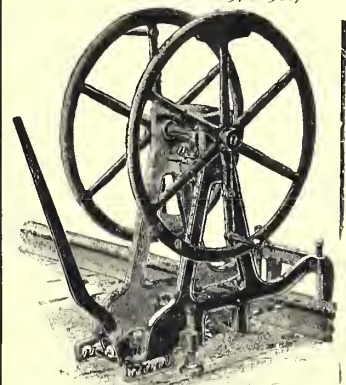
## Sweet's Track Drill

Lever Feed. Easy Action.

Tilting or Straight Adjustment.

DRILLS HOLES FROM SMALLEST SIZE TO  
1 1/4 INCH. USED INSIDE OR  
OUTSIDE OF RAIL.

(Patented March 29, 1898.)



Michigan Manufacturing Co., - - Ypsilanti, Mich., U. S. A.

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WORKS  
Harvey, Ill.

CHICAGO OFFICE  
917 Monadnock Block.

Manufacturers of Complicated Special  
Work for City and Interurban Railways.  
We Guarantee Accuracy and Excellence.

Let us quote you prices on Switches,  
Frogs, Crossings, Curves, Etc.

**PAIGE IRON WORKS.**

## THE ADVERTISEMENT

.. OF THE ..

### American Improved Rail Joint Company

CHICAGO

Will be found on page 28 of this issue

## A List

OF THE RAILWAY  
APPARATUS AND SUPPLIES  
MANUFACTURED BY THE

### General Electric Company

WILL BE FOUND ON THE  
BACK COVER OF  
THIS ISSUE.

See also Pages 115-118.

## The Union Switch & Signal Co.

Manufactures every known variety of  
automatic and semi-automatic railroad  
signals; also manual control signals,  
frogs, switches, etc. It makes mechan-  
ical, pneumatic and electrical interlock-  
ing mechanisms of all kinds.

See Westinghouse Advertisements in Every Section of this  
Book.

FOR ADVERTISEMENTS OF  
**EUROPEAN**  
MANUFACTURERS,  
DEALERS AND  
CONTRACTORS

See pages 34-102 of this issue.

**Section I**

**FINANCIAL AND  
ENGINEERING**

Bankers, Brokers, Trust  
Companies, Engineers  
and Contractors

**Section V**

**RAILS AND TRACK  
MATERIAL, SIGNAL SYS-  
TEMS, STRUCTURAL  
IRON WORK**

**CLASSIFIED  
CYCLOPÆDIA OF  
MANUFACTURERS,  
DEALERS,  
CONTRACTORS,  
ETC.**

**Section II**

**EUROPEAN MANUFACTUR-  
ERS AND CONTRACTORS**

Leading British,  
German and  
French Houses

**Section VI**

**POLES AND LINE MAT-  
ERIAL, RAIL BONDS, WIRES  
AND CONDUITS, ELEC-  
TRICAL INSTRUMENTS  
AND SUPPLIES**

**SECTION VI.**

**POLES AND LINE MATERIAL, RAIL BONDS,  
WIRES AND CONDUITS, BRUSHES AND  
COMMUTATORS, MICA, ELECTRICAL  
INSTRUMENTS AND SUPPLIES**

**PAINTS AND VARNISHES.**

**Section III**

**ELECTRICAL MACHINERY,  
STORAGE BATTERIES,  
MOTIVE POWER  
SYSTEMS**

**Section VII**

**CAR and TRUCK  
EQUIPMENT**

Brakes, Registers, Fenders,  
Wheels, Heaters, Head-  
lights, Trolleys,  
Gears, etc.

**FOR  
ALPHABETICAL  
INDEX TO  
ADVERTISERS  
SEE  
PAGES 5-6-7**

**Section IV**

**STEAM PLANT  
EQUIPMENT  
REPAIR SHOP  
APPLIANCES**

**Section VIII**

**ROLLING  
STOCK**

Cars, Trucks, Snow  
Plows, Sweepers and  
Sprinklers



908-Toggle Feed Wire Insulator



"Philadelphia" Section Insulator



908-Toggle Feed Wire Insulator

# Complete Overhead Equipment



No. 825-Frog Pull-Off



No. 805-Brooklyn Strain



No. 830-No. 1 Giant Strain



Section of 830

# Vulcabeston Controller Insulation

Resists High Temperatures

Tough—Strong—Dense—Non-Absorbent

Produced in Special Forms

## Is Your Car Equipment Safely Protected?

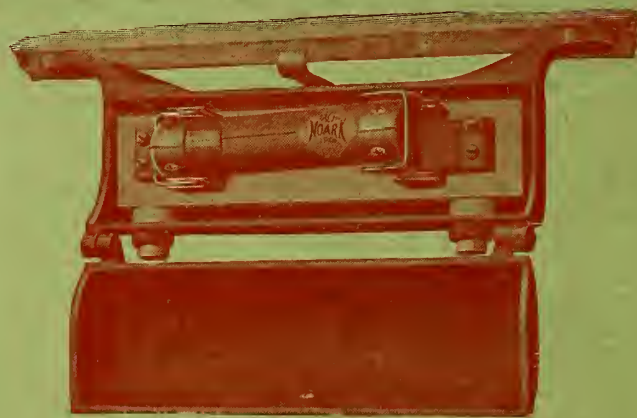
ACCIDENTS ARE MORE EXPENSIVE THAN NOARK FUSES

## SACHS "NOARK" ELECTRIC RAILWAY CAR EQUIPMENTS ARE SAFE

DO NOT ARC BUT INDICATE

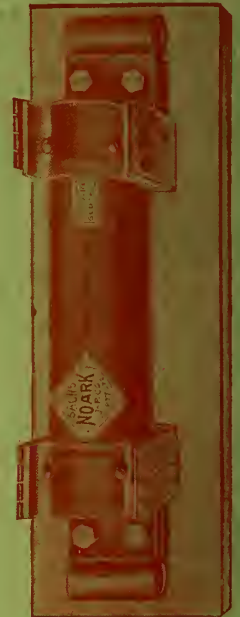


Type "A"—100 Ampere Screw Contact



"Noark" Car Cutout Equipment with Type "D" 150 Ampere Block

THE NOARK FUSE IS THE IDEAL MOTOR PROTECTOR  
IT DOES NOT BLOW ON MOMENTARY RUSHES, BUT DOES ON CONTINUED OVERLOAD



Type "C"—600 Ampere Switch Contact

SEE PRACTICAL DEMONSTRATION AT CONVENTION BOOTH

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Styles "E," "A" and "H."



Class H.—Length, 18 in.; height, 8 in.; diam., 4 in.; weight, 9 lbs.



908-Toggle Feed Wire Insulator

# H. W. JOHNS M'F'G CO.

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PHILADELPHIA  
COLUMBUS

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NEW ORLEANS  
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908-Toggle Feed Wire Insulator

Western Representatives, MANVILLE COVERING CO., Chicago

# OVER 400 MILES

Complete Overhead and Pole Equipment  
(excepting wire) furnished in the last

## SIX MONTHS

We doubt if this has been equaled  
by any other dealer in America.

We carry the largest and most  
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Telephone and Lighting Supplies  
in New England.



# Stuart-Howland Co.

Tel. Branch                      281-283-285-287 DEVONSHIRE ST.  
Exchange with 4 Trunk Lines,                      BOSTON.  
4144 Main.



# Protection

of the most perfect kind—which is absolute—  
which secures peace of mind and dismisses that  
constant dread from an ever threatening danger  
during the summer months.

# Guaranteed

results add to that feeling of security which “pro-  
tection” brings. The small air-gap and low  
resistance path for the discharge makes the

# GARTON LIGHTNING ARRESTERS

the best protectors and they don't burn  
out like other makes — anyway we  
warrant them for one year.

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**L. J. HEALING & CO., 74 Main St., Yokohama Japan  
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**GOUDEY-McLEAN CO., 28 Platt Street, New York City.**





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B R A S S  
C O M P A N Y  
M A N S F I E L D , O H I O  
U . S . A**

**MANUFACTURERS  
*of*  
ELECTRIC  
RAILWAY  
SUPPLIES**

# American Steel & Wire Co.

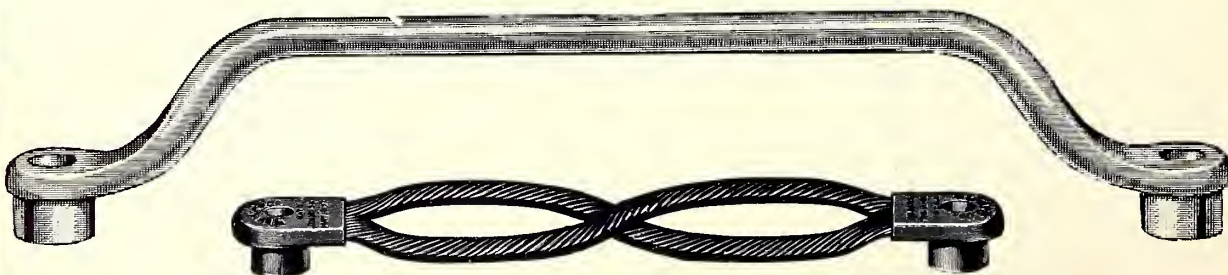
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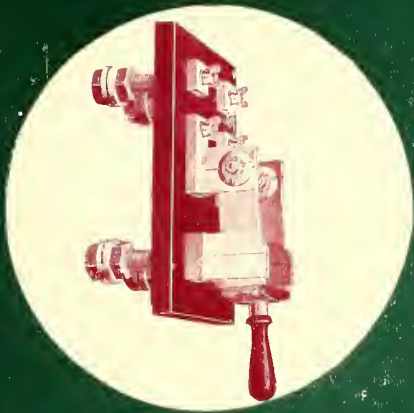
DENVER

SAN FRANCISCO.

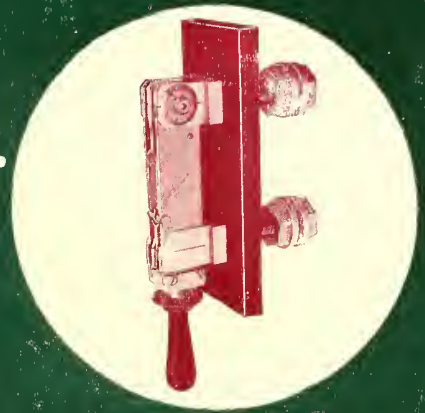
**“CROWN”**  
**RAIL BONDS**

PERFECT ELECTRICALLY AND MECHANICALLY





# SWITCHES AND SWITCH BOARDS.



## ANDERSON LINE MATERIAL

FOR ELECTRIC RAILWAYS

AETNA AND HECLA  
INSULATION

# ALBERT & J. M. ANDERSON MFG. CO.

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BRANCH OFFICES

135 BROADWAY, NEW YORK.

BRANCH OFFICES

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LONDON, ENGLAND.

50 BOULEVARD,  
HAUSSMAN,  
PARIS, FRANCE.

1 RUE D'ARENBERG,  
BRUSSELS, BELGIUM.

Two Awards  
At Chicago  
1893

"Hors Concours"  
At Belgium  
1897  
Medal at Paris  
1900

# American Steel & Wire Co.

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## BARE AND INSULATED ELECTRICAL WIRES OF EVERY DESCRIPTION

Catalogue on Application

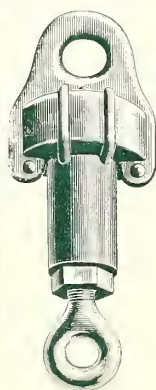


This "Trade Mark" is to  
Electric Railway Material  
as Sterling is to Silver

A Good Thing  
Will Bear  
Repeating

Catalogs on Application

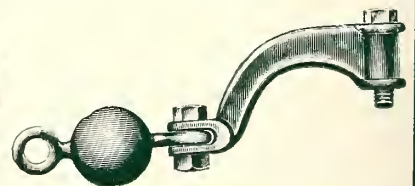
Manufacturers of  
**Overhead Electric Railroad Material**  
Everything Required for their  
Construction and Maintenance



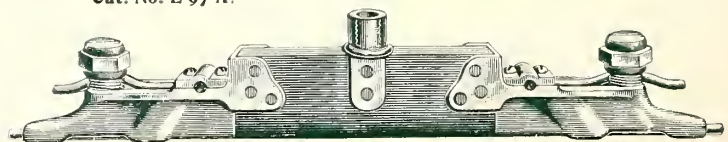
E 136



Cat. No. E 97 A.



Cat. No. 103. Single Curve Pull Off.



Cat. No. E'144. New York Type Section Insulator.

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NEW YORK, 118-120 John Street. LONDON OFFICE, 8 Long Lane, E. C.  
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GEO. T. MANSON, General Supt.  
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**A NEW DEPARTURE  
IN RAIL BONDING**  
*The Chase-Shawmut*  
**Flexible Rail Bond**

No Compressed  
Heads to  
become loose

**Perfect Contact**



**Enduring Life**  
 without  
**Deterioration**

**No Loss of**  
**Current to cause**  
**Electrolysis**

PATENTED

WRITE  
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**Chase-Shawmut Co.**

SOLE MANUFACTURERS

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John A. Roebling's Sons Co.

THE RELIABILITY OF ROEBLING  
TRACTION EQUIPMENT

— IN —

TROLLEY WIRE

FEEDER WIRE

Underground Leadcovered Cables, Magnet Wire

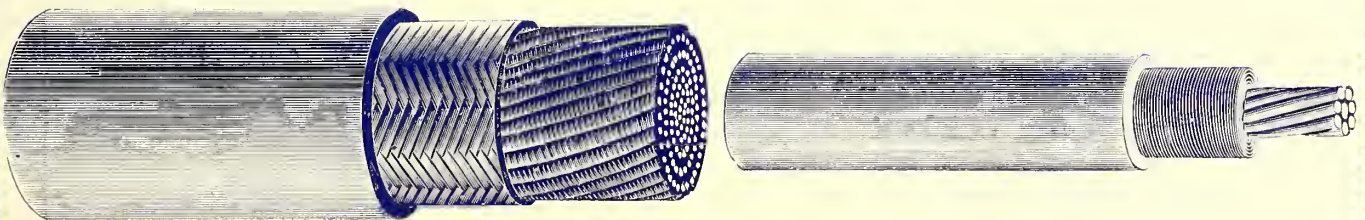
Suspension Strand

HAS STAMPED OUR PRODUCTS IN THIS LINE

THE STANDARD OF THE WORLD



WORKS AT TRENTON, N. J.



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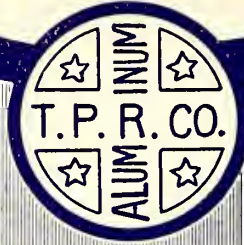
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Aluminum Feeders are less than one-half the weight of copper feeders and are of equal conductivity and strength.

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**EASILY APPLIED  
EQUALS  
CONDUCTIVITY OF RAIL  
AFTER  
FIVE YEARS  
SERVICE**



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High Tensile Strength and Elastic Limit. Great Ductility. Will not stretch. Does not break at kinks, joints or scratches. Practically non-corrodible. This wire cannot be equalled where safe, durable and permanent construction is required.

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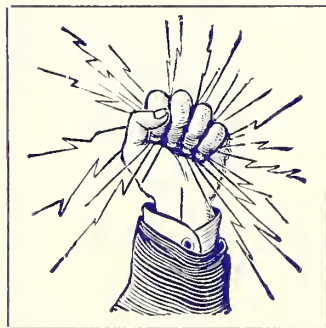
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Bare and Insulated Electric Wire. Railway Feeder and Trolley Wire.  
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# SEE ANNOUNCEMENT OF THE BISHOP GUTTA PERCHA CO.

FACING LAST READING PAGE OF THIS ISSUE

<p>FACTORIES: Perth Amboy, N.J. Pittsburgh, Pa. and Oakland, Cal.</p>	<p><b>Standard</b> Rubber, Paper, Fiber, <b>Underground</b> Street Railway, Tele- <b>Cable Co.</b> graph, Telephone and Electric Light Wires and Cables.</p>	<p>Overhead- Underground - Sub-marine.</p>	<p>Cables and Wires for all Service Furnished and Installed. Write for Estimates.</p>	<p>OFFICES: Pittsburgh, Pa. Westinghouse Bldg. N. Y. City, 56 Liberty St. Philadelphia, Pa. 1225 Betz Bldg. Chicago, Ill. 542 The Rookery San Francisco, Mills Bldg. Boston. Tremont Bldg.</p>
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# Don't Blame Us!

If the Earth  
Eats Up Your Money

If you are driving good workable  
current into the ground ❧ ❧ ❧

## Blame Yourself

We can show you the way to keep all this good current in its proper useful channel.

**The way is by using "Protected" Rail Bonds**

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It's economical because it's the best. You can apply it anywhere.

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All Types — Solid, Flexible,  
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The very best bonds that the market affords. Strands and terminals are perfectly united. Made on scientific principles and guaranteed to possess 98% of conductivity.



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UNDER LETTERS PATENT  
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- Will last many times longer than any other brush.
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RES  
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ROLL DROP AND DROP FORGED

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A cheap but excellent Switchboard Instrument for Direct Current Circuits. Particularly suited for Isolated Plants and Feeder Circuits in Railway and Power Plants.

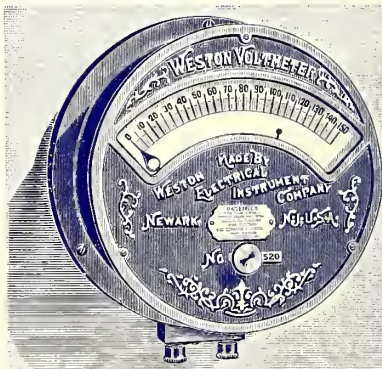

Voltmeters in ranges from 3 to 750 volts. Ammeters in ranges from 1 to 2,500 amp.

All Weston Instruments are unsurpassed in excellence of workmanship, in accuracy and economy of operation.

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Opens instantly on dangerous overloads.  
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Guaranteed to open the circuit 500 times without requiring repairs.

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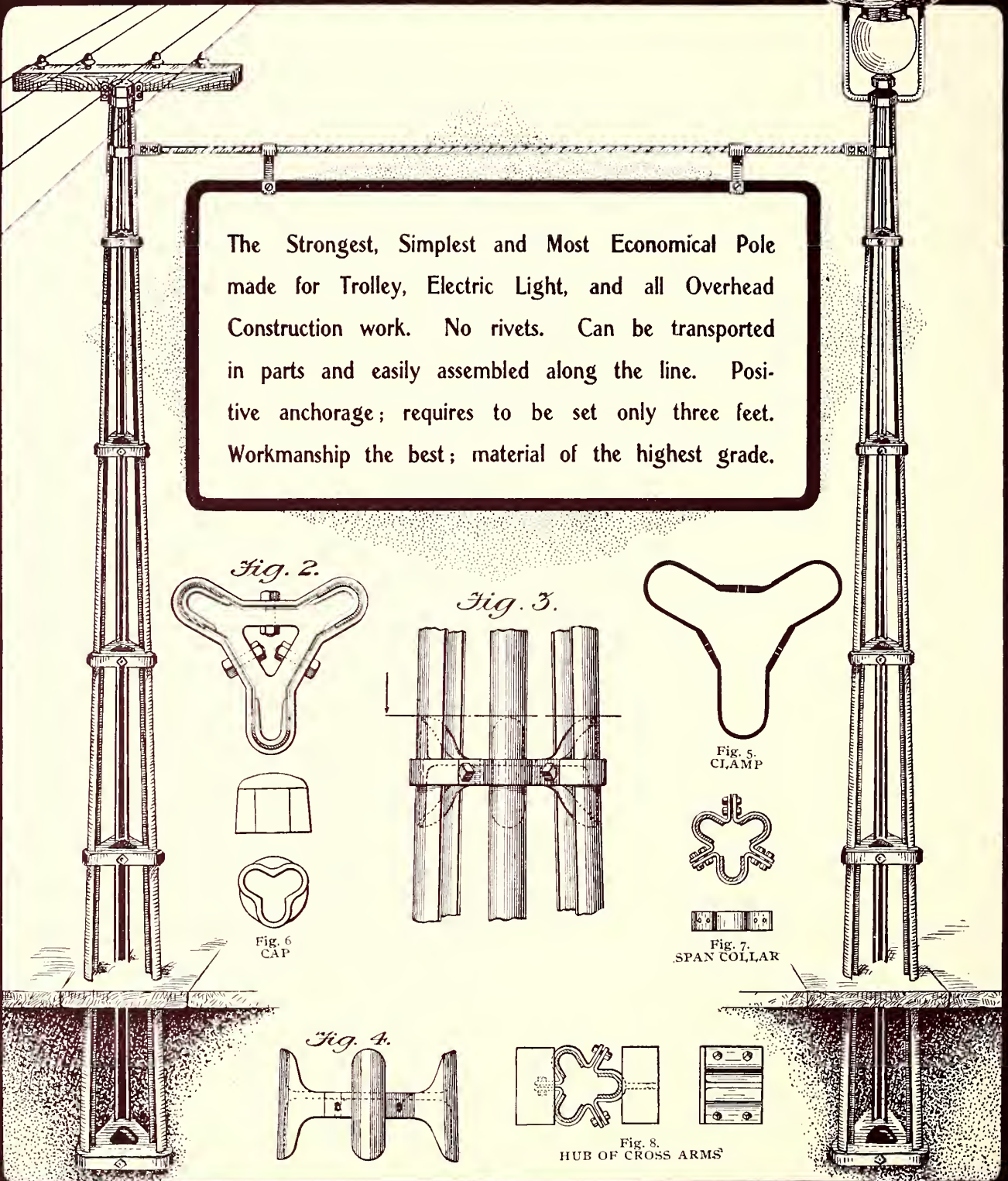
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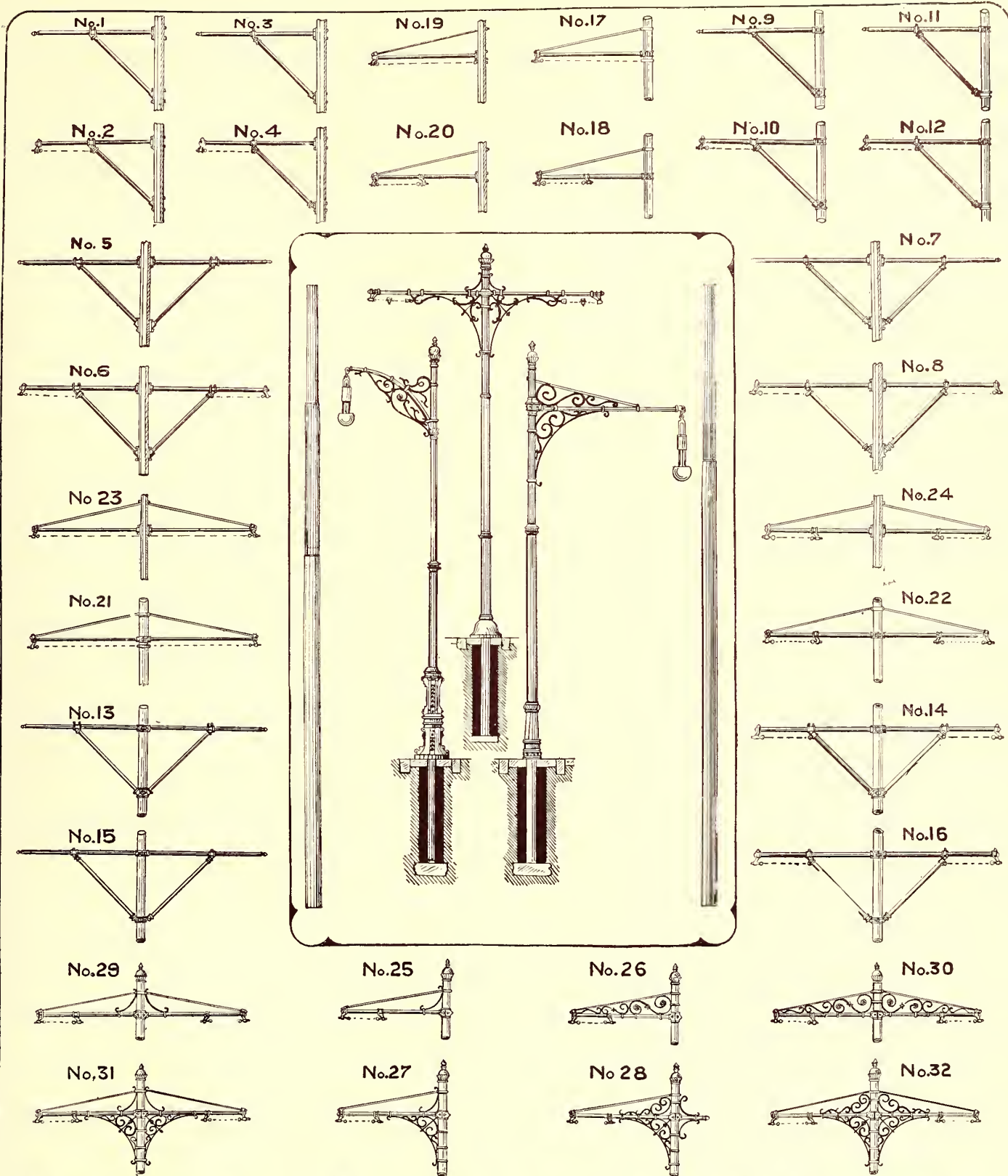


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From Long Leaf Yellow Pine

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**SOUTHERN WHITE  
CEDAR POLES...**  
For Trolley and Electric  
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LARGE STOCK of YELLOW **TIES**  
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**TIES** TROLLEY AND STEAM  
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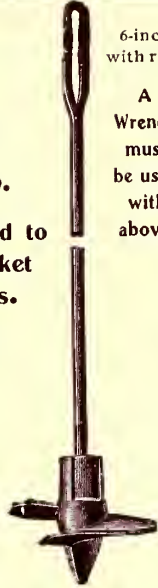
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Use 6 and 8-inch for  
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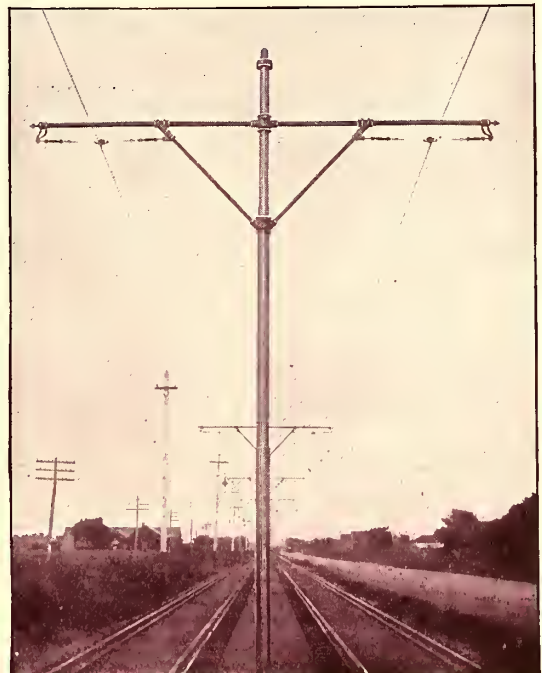
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Complete Equipment for  
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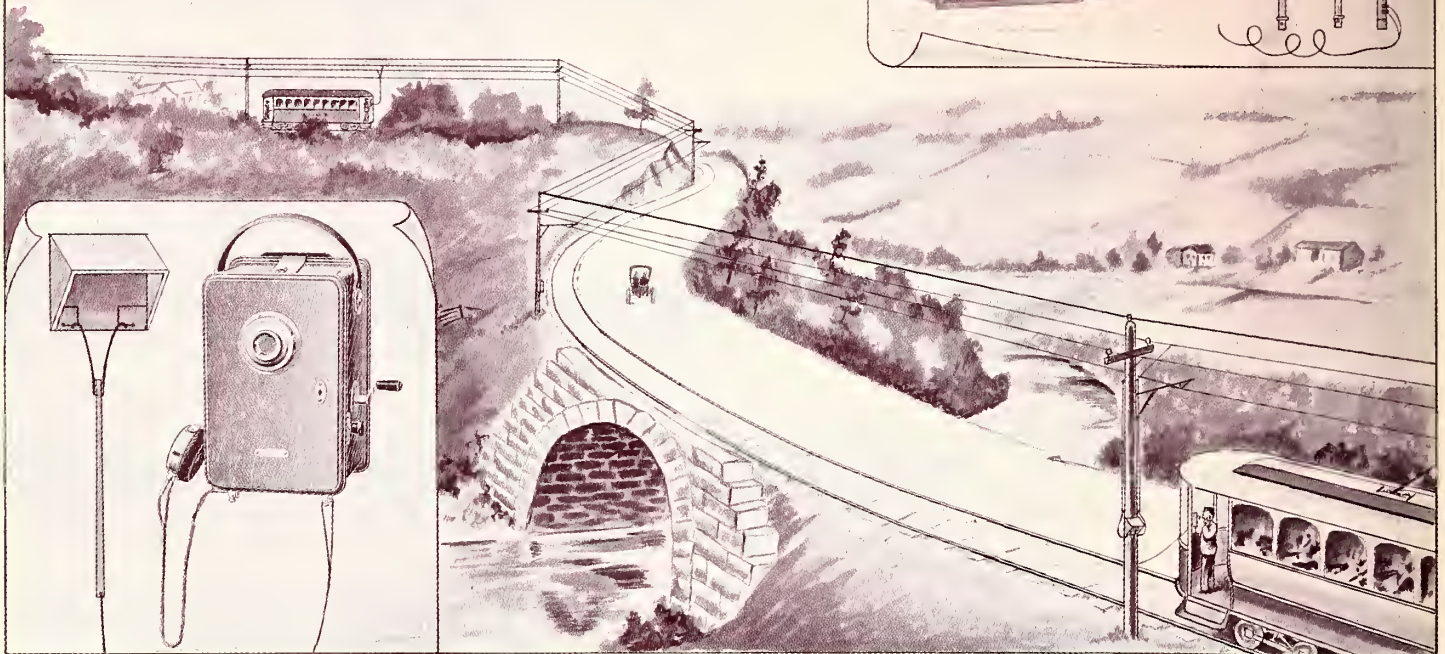
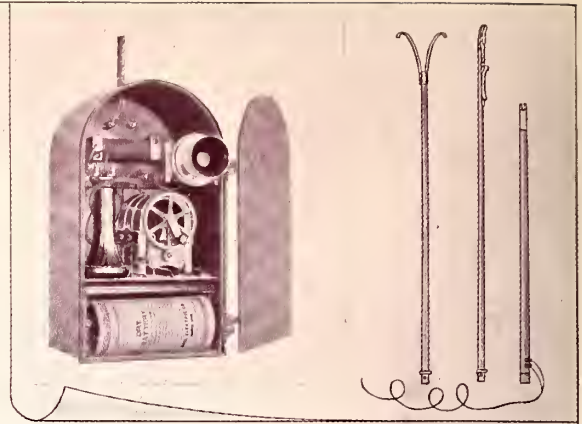
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Armature Winding and Building.  
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 Transformers and Fields of all types rewound  
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.005 in thick	1500 volts.	.005 in.	about 2½ lbs per 100 sq. ft.
.010 "	" 2000 "	.010 "	" 5 "
.015 "	" 3000 "	.015 "	" 7½ "

Tensile strength about 10000 lbs. per square inch of section.

For further particulars write the  
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 Manufacturers of Hard and Flexible Fibre for Electrical and Mechanical Purposes. Sheets, Rods, Washers, Discs, Special Shapes

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A Hard, Firm,  
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Is absolutely the whitest white paint made.  
It is strictly a paint in every sense of the word. It is a dry powder simply mixed with water instead of oil. It is **ABSOLUTELY WEATHERPROOF**; a surface as hard and firm as iron, that will not come off with the most severe rubbing, will never chip or peel.  
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It obviates frictional heating,  
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Put up in packages for conveni-  
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Send for a catalogue explain-  
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For Roofs, Bridges, Boiler Fronts, Stacks  
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Few buildings are burned, but all are exposed to  
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COMPARE IT with the Insulating Varnish  
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Fire, Frost, Water and Acid Proof.  
 The Best Insulation for Contact Rails

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 MORE ECONOMICAL } **THAN GLASS**

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BARE COPPER WIRE and CABLE,  
 PAPER INSULATED CABLES

For Telephone, Telegraph, Electric Light and Power

CEMENT LINED PIPE FOR CONDUITS

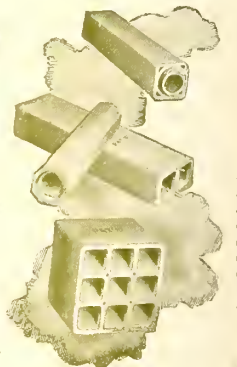
Executive Offices, Times Building, NEW YORK, N. Y.

## AMERICAN VITRIFIED CONDUIT COMPANY

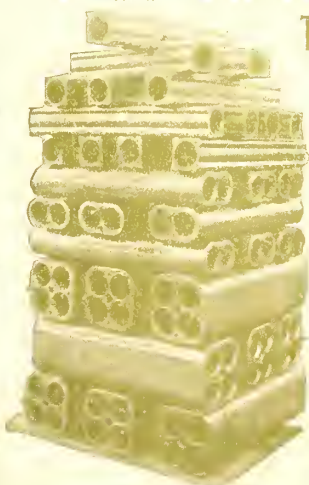
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Vitrified Glazed Conduits

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FOR UNDERGROUND ELECTRIC WIRES

FIVE  
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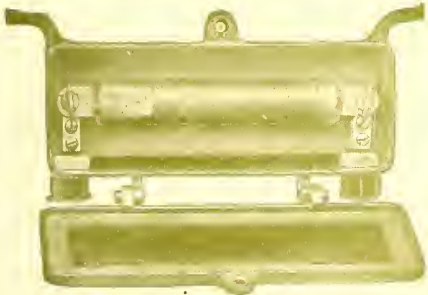
- 1st. Being of *Vitrified Terra Cotta* they do not absorb water and when properly laid are indestructible by the elements.
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- 3d. Our *standard length of 30 inches* is the most suitable to insure perfect vitrification and glazing, is most easily handled, least liable to breakage in handling, and consequently the most economical.
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- 5th. As no mortar or other substance is allowed to enter the ducts while being laid there is no cleaning of them required preliminary to drawing the cables.

The Potomac Terra Cotta Co., 36 CORCORAN BUILDING WASHINGTON, D. C.



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IF NOT



D. & W. Street Car Motor Cut-Out. Safety Devices of all kinds, with Non-Arcing Fuses. They are convenient, save time, protect property. Ask for Price List No. 7.



“The Gem” saves current by forcing rain to drip. Skirt won't jar loose. Insulation can't be beat. Has  $\frac{5}{8}$  inch stud.



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AND PRICES

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Cost more per foot than other wires, but is the cheapest in the end because it lasts longer than any other wire made.



## Central Electric Company

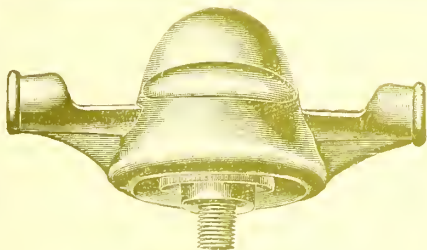


264, 266, 268, 270 FIFTH AVENUE, CHICAGO.



### Shaw's Non-Arcing Lightning Arrester

MEDBERY  
INSULATION



SHAW'S COPPER AND COMPOSITION CASTINGS

H. M. SHAW

C. J. HARRINGTON

Manufactured by

### H. M. Shaw & Co.

Send for  
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# Westinghouse

Electric & Mfg. Co.

BUILDERS OF

Generators                      Rotary Converters  
Stationary and Railway Motors  
Transformers  
Switchboards and Auxiliary Apparatus

See Westinghouse Advertisements in Every Section  
of this Book.

# A List

OF THE RAILWAY  
APPARATUS AND SUPPLIES  
MANUFACTURED BY THE

## General Electric Company

WILL BE FOUND ON THE  
BACK COVER OF  
THIS ISSUE.

See also pages 115-118.

## The Columbia Patent Strain Line Anchor...

IS ONE OF  
OUR LEADING  
SPECIALTIES

*See advertisement on page 247 of this issue.*

## COLUMBIA MACHINE WORKS

18 FULTON STREET :: :: :: BROOKLYN, N. Y.

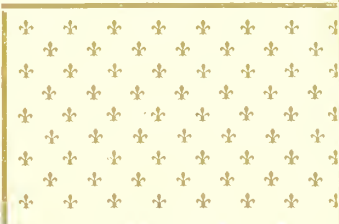
## “EVERYTHING FOR ELECTRIC RAILWAYS”

See Our Advertisements in  
Sections II, V, VII and VIII  
Of this issue ✨ ✨ ✨ ✨ ✨ ✨

## Wendell & MacDuffie

26 CORTLANDT ST., NEW YORK

Headquarters for  
High Grade  
Electric  
Railway  
Supplies



# Pettingell-Andrews Company



Boston, Mass., U. S. A

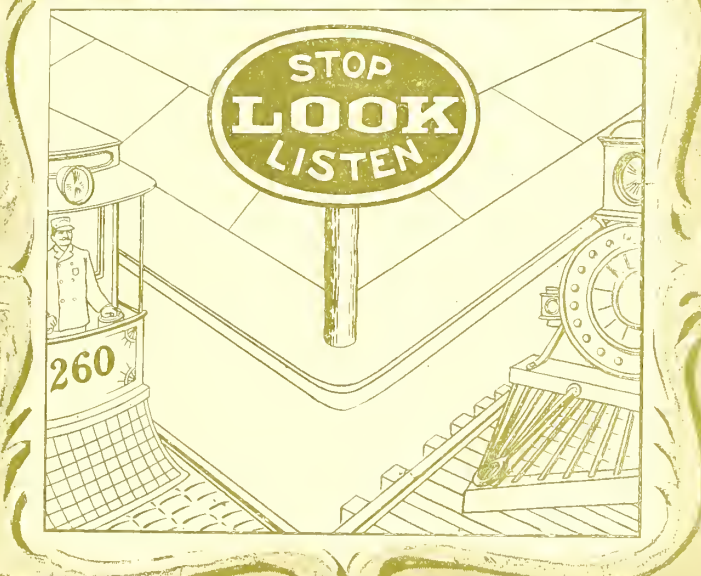
WRITE US FOR PRICES

A COMPLETE REPAIR SHOP FOR EVERYTHING ELECTRICAL  
**ARMATURE & ARMATURE**

**COILS & & CORES**

WE WILL CONTRACT TO OVERHAUL YOUR  
EQUIPMENTS COMPLETE.

WE  
MAKE  
TROLLEY  
HARPS



WE  
MAKE  
TROLLEY  
POLES

COMMUTATORS, NEW, ASSEMBLED AND REFILLED.  
SPECIAL SERIES BURNING RAILWAY LAMPS.

A GUARANTEE GIVEN WITH EVERY LAMP.

GENERATOR REPAIRS A SPECIALTY.

LARNS SELF LUBRICATING METALLIC PACKING.  
NO SPECIAL STUFFING BOX REQUIRED.

PROMPTNESS

RELIABILITY

PENNSYLVANIA ELECTRICAL AND RAILWAY SUPPLY CO

THIRD STREET AND PENN AVENUE.

PITTSBURG, PA.

U.S.A.

**DRESSEL**

**RAILWAY HEADLIGHTS**

**For Street Railways  
and Locomotives.**

**THE DRESSEL  
RAILWAY LAMP WORKS**

3876-8 Park Ave.      934 Monadnock Block,  
NEW YORK.                      CHICAGO.

## The Sawyer-Man

incandescent lamp has been the standard lamp for over twenty years. It is produced with the same careful attention to details which characterizes all Westinghouse products. It is particularly noted for its long life, its all-round efficiency and for mechanical and electrical uniformity.

See Westinghouse Advertisements in Every Section of this Book.

**LE VALLEY  
VITAE CARBON  
BRUSH CO.**

45 Broadway,  
New York City.

**COMMUTATORS  
LAST 5 TIMES LONGER**  
With Le Valley Brushes;  
and Le Valley Brushes last  
**4 TIMES LONGER**  
than other carbon brushes.  
**CALCULATE YOUR SAVING.**

## WARD LEONARD CIRCUIT BREAKERS

WARD LEONARD ELECTRIC CO., BRONXVILLE, N. Y., U. S. A.

We take the liberty of calling your attention to the suits of the Mercantile Publishing Syndicate (Limited) against the Western Union Telegraph Co., and same against the International Cable Directory Co., and another, decided in the High Court of Justice, Queen's Bench Division (England), before Mr Justice Ridley as appears from the London Times of July 11th, 1899, in which suits judgment was rendered, enjoining the publication or sale, by the defendants or their agents, of the Western Union Telegraphic Code and International Cable Directory, on the ground that such publication and sale are infringements on the copyright of the plaintiff in those actions.

## Lieber's Standard Code

AN ENTIRELY ORIGINAL CODE.  
PRICE, \$10.00.

**SELECTED CODE WORDS** The Ciphers are selected from the "OFFICIAL VOCABULARY," care having been taken to omit such DANGEROUS ciphers as "cheap," "charge," "collect," "himontbly," "eleventh," "eighteenth," "cargo," etc., which are found in other codes.

**CONTENTS** The Code contains 800 pages of 75,000 Ciphers 65,000 have sentences, and 10,000 are blank, enabling the addition of private phrases under their proper headings.

**DIRECTORY OF USERS** LIEBER'S MANUAL published every three months, contains a revised list of those using the code. NO OTHER CODE FURNISHES SUCH A LIST.

**BEST EXTANT** That LIEBER'S CODE is recognized as the best ever offered to the public is shown by the following houses, who have unqualifiedly endorsed it in preference to all others.

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| Garton-Daniels Electric Co.      | Machine Co.                 |
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| Robert W. Blackwell.             | Christensen Engineering Co. |
| Safety Third Rail Electric Co.   | Berlin Iron Bridge Co.      |
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| Risdon Iron Works.               | Ball & Wood Co.             |
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| American Metal Co.               | Manning, Maxwell & Moore.   |

## LIEBER CODE CO.,

2 and 4 STONE STREET  
NEW YORK.

20 BUCKLESBURY,  
LONDON, E. C.

..Always in Season..



SECTIONAL VIEW

**Always Ventilating**

DAY AND NIGHT RAIN OR SHINE

Also VENTILATORS FOR EXPORT

# Power Houses and Buildings Ventilated AT LITTLE COST

WE have equipped Power Houses and Buildings all over the world—such as the

- KOLGOORLIE TRAMWAY CO., AUSTRALIA
  - ST. CHARLES STREET RY. CO., NEW ORLEANS
  - GALVESTON CITY RY. CO., GALVESTON, TEXAS
  - PEEKSKILL LIGHTING & R.R. CO., PEEKSKILL, N. Y.
  - YOUNGSTOWN GAS & ELEC. CO., YOUNGSTOWN, O.
- AND MANY OTHERS

We will be pleased to send you our new catalogue and sample and give you an estimate.

## PANCOAST INTERNATIONAL VENTILATOR CO.

Manufacturers "IMPROVED PAN-COAST VENTILATORS"

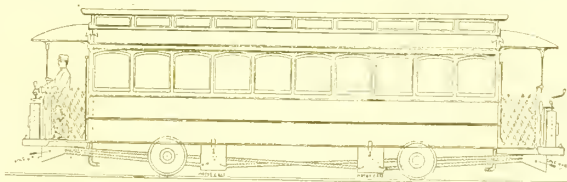
Salesroom and Office, 223 and 225 SOUTH FIFTH ST., PHILADELPHIA

Offices, NEW YORK and LONDON

### ELECTRIC MOTOR AND GENERATOR VENTILATING CO.

421 Chestnut Street, Philadelphia.

Our new ventilator is a simple and efficient device for carrying cold air direct to the motor case, from the hood through hose under car, or from the funnel at top as may be preferred. Will ventilate from either end, according to direction of moving car.



SOME POINTS OF MERIT.

Keeps motors clean and cool; will break arcs on commutators; increases fully five times the life of armatures, commutators, field coils and brush holders; decreases labor in car house; takes no power to operate.

WHY NOT GIVE IT A TRIAL?

## The Street Railway Roadbed....

By MAON D. PRATT  
.....and C. A. ALDEN

An essential feature of a well-equipped street railway is a good track, and in this book are brought together and illustrated the various modern types of track material and methods of construction, with their good and bad features indicated. The authors are engineers of the Pennsylvania Steel Company, one of the largest manufacturers of rails and "special work" in America, and are therefore particularly well equipped to treat of the subjects of which they write. All the various features of street railway roadbed construction are carefully described, with illustrations where necessary, the latter including sections of rail, of roadbed, views of special joints, diagrams etc. Rules and tables are also given for running curves, laying out crossings, turnouts, etc.

135 Pages, 157 Illustrations. Price, \$2.00.

PUBLISHED BY THE

Street Railway Publishing Company, 120 LIBERTY ST., New York.



**THE IDEAL FIRE PROTECTION FOR ALL KINDS OF ELECTRICAL APPARATUS**

## A Sure Fire Extinguisher — A Perfect Insulator

The only Extinguisher adapted for Switch Boards, Electric Light Stations, Street Railway Equipments, Subway Manholes, and all Electrical Fires.

Adopted by the Western Union and Postal Telegraph Companies, and by many of the leading Street Railways, Telephone and Electric Light Companies throughout the United States and Canada.

**Monarch Fire Appliance Co.**  
27 WILLIAM ST., NEW YORK

Write for Descriptive Booklet



This is our "Black Badge," No. 167. It has been eminently satisfactory. Employers like them because they are so readily seen; employees like them, because they are so light (in weight); we like to make them because they are so satisfactory.

**AMERICAN RAILWAY SUPPLY COMPANY**  
24 Park Place - New York

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 British Electric Car Co., Ltd., London.  
 British Insulated Wire Co., Prescott, England.  
 British Thomson-Houston Co., Ltd., London.  
 British Schuckert Electric Co., Ltd., London.  
 British Westinghouse Electric & Mfg. Co., Ltd., London.  
 Brush Electrical Engineering Co., Ltd., London.  
 Callenders Cable & Construction Co., London.  
 Connolly Bros., Ltd., Manchester.  
 Crompton & Co., Ltd., London.  
 De Ferranti, S. Z., Ltd., Hollingwood, England.  
 Dennis, W. F. & Co., London.  
 Dick, Kerr & Co., Ltd., London.  
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 Electric Tramway Equipment Co., Birmingham, England.  
 Elliott Bros., London.  
 Estler Bros., London.  
 Forest City Electric Co., Manchester, England.  
 General Electric Co., Ltd., London.  
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 Howard Conduit Co., Ltd., Manchester, England.  
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 Johnson-Lundell Electric Traction Co., Ltd., London.  
 Kelvin & James White, Ltd., Glasgow, Scotland.  
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 Nalder Bros. & Thompson, Ltd., London.  
 Witting Bros., Electrical Engineers & Contractors, Ltd., London.  
 Siemens Bros. & Co., Ltd., London.  
 Simplex Steel Conduit Co., Ltd., Birmingham, England.  
 Smith, Frederick & Co., Wire Mfrs., Ltd., Manchester, England.  
 Societe Francais des Cables Electriques, Paris.  
 Societe Industrielle d'Electricite Procèdes Westinghouse, Paris, France.  
 Sterling Varnish Co., Birmingham, England.  
 Suter, Frank & Co., Ltd., London.  
 Union Electricitäts-Gesellschaft, Berlin, Germany.  
 Witting Bros., Electrical Engineers and Contractors, Ltd., London.

*For European Advertisements, see pages 34-102 of this issue*



We like to Sing the Praises Of Our Carbon Brushes...

JOIN IN THE CHORUS:  
 "PARTRIDGE BRUSHES ARE THE BEST."  
 PARTRIDGE CARBON WORKS, - - - SANDUSKY, OHIO.

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 JOSHUA HENDY MACHINE CO., San Francisco, Cal.  
 C. R. HEAP, London Agent, 47 Victoria St., Westminster, S. W., England.  
 Mr. VICTOR DOURIN, 28, Rue de la Montagne, Brussels, Belgium.

**Switches, Panel Boards and Switch Boards**

**FOR ALL REQUIREMENTS**

See pages 240-241 of this issue

**CROUSE-HINDS ELECTRIC CO.**  
 SYRACUSE, N. Y.

**THE ANGLO-AMERICAN VARNISH COMPANY**

ESTABLISHED 1872. NEWARK, N. J. INCORPORATED 1890.

**MILLER-KNOBLOCK** **COMMUTATORS** **SOUTH BEND, INDIANA.**

**MICA MICANITE EMPIRE CLOTH AND PAPER M. I. C. COMPOUND**

QUALITY THE BEST  
 PROMPT SHIPMENTS  
 LOW PRICES  
 LARGE STOCK

AWARDED GOLD MEDAL, PARIS, 1900  
 EUGENE MUNSELL & CO. MICA INSULATOR CO.  
 FIRST HANDS ORIGINATORS  
 CHICAGO AND NEW YORK

OPEN HEARTH  
CAST STEEL CUT  
**GEARS**

**U. S. PROJECTILE BRAND  
GEARS**

PATENT PRESSED  
HIGH CARBON STEEL  
**PINIONS**

AND

ACCURACY  
UNIFORMITY  
TOUGHNESS  
AND GOOD WEARING  
QUALITIES ARE  
PRODUCED BY  
OUR METHODS



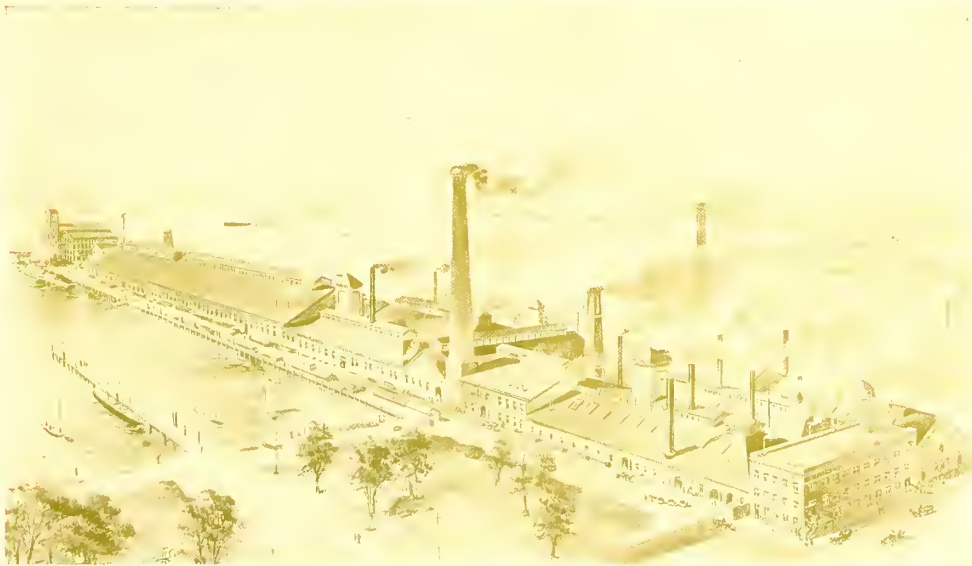
USED FOR  
NINE YEARS  
BY THE LARGEST  
STREET RAILROADS  
IN THE U. S. AND  
CANADA

**PINIONS**

FOR ALL ELECTRIC SYSTEMS

**HIGHEST IN CARBON**

**LONGEST IN LIFE**



WORKS AND DOCK OF THE UNITED STATES PROJECTILE CO.

MANUFACTURED BY

**THE UNITED STATES PROJECTILE CO.**

**ARMATURE  
SLEEVES**

OFFICE AND WORKS **FIRST AVE. AND 530 ST.**

Borough **BROOKLYN**

**NEW YORK, N. Y., U. S. A.**

Cable Address, "PROJECTILE, BROOKLYN"

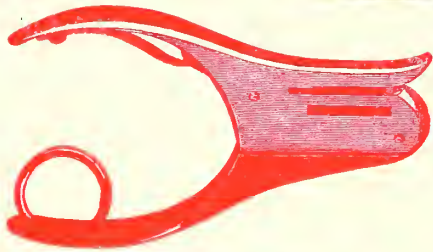
**FORGINGS**

SELLING AGENTS  
**ECCLES & SMITH**  
SAN FRANCISCO, CAL.

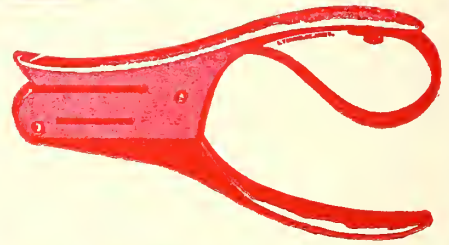
**THE W. R. GARTON CO.**  
CHICAGO, ILL.

# WOODMAN

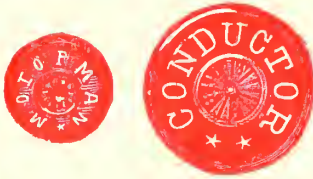
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...Our...  
**Cast Steel  
Ticket Punches**



are almost universally  
used for cancelling transfer  
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**UNIFORM  
BUTTONS**

special designs, with monogram  
on same, made to order.



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**WHISTLES**

made in many different styles  
and tones.



**Cap and  
Coat Badges**

of every description, in  
imitation gold, nickel  
and German silver.

Send for descriptive  
circular and price list  
of our railroad supplies.



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IRON WORK**

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**ELECTRICAL MACHINERY,  
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MOTIVE POWER  
SYSTEMS**

**Section IV**  
**STEAM PLANT  
EQUIPMENT  
REPAIR SHOP  
APPLIANCES**

**FOR  
ALPHABETICAL  
INDEX TO  
ADVERTISERS  
SEE  
PAGES 5-6-7**

**Section VII**  
**CAR and TRUCK  
EQUIPMENT**  
Brakes, Registers, Fenders,  
Wheels, Heaters, Head-  
lights, Trolleys,  
Gears, etc.

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Plows, Sweepers and  
Sprinklers

# GOLD'S ELECTRIC HEATERS

have invariably shown the highest efficiency in delivering the warmed air into the space to be heated—an even graduation of temperature and a uniform distribution always provided when our electric heaters are used. The economical consumption of current, the low cost of original installation and the simple method of applying our electric heaters are also prominent points of advantage.

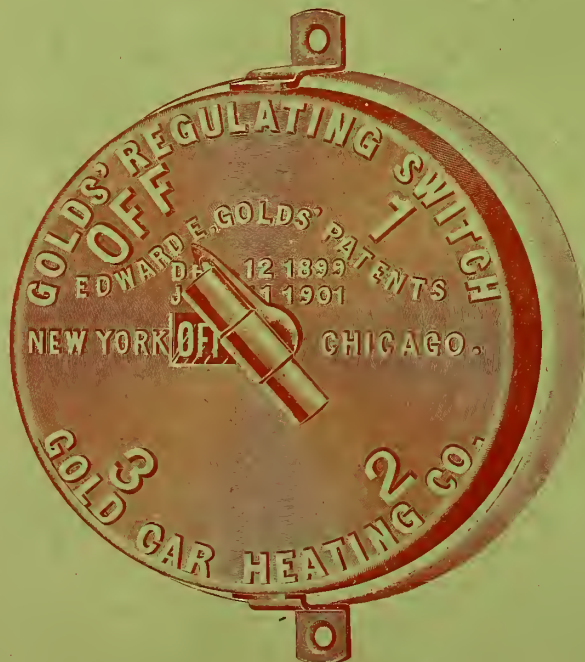


GOLD'S IDEAL (3-degree) PANEL ELECTRIC HEATER.

The GOLD ELECTRIC HEATERS always maintain their original condition. There is no possibility of the wire corroding, burning out or short circuiting. Our electric Heaters do not increase in consumption of current with usage, (a very detrimental feature and one that shortens the life of some other types of electric heaters).

About 75,000 Gold Electric Heaters are now in use and all are giving entire satisfaction.

The Metropolitan Street Railway of New York City, The Brooklyn Rapid Transit Company, The Boston Elevated and Street Railways, The Massachusetts Electric Companies and many other prominent Elevated and Street Railways are using Gold Electric Heaters.



## GOLD'S IMPROVED 3-POINT REGULATING SWITCH

This regulating switch may be operated in either direction. It is arranged to control three intensities of heat, and will easily carry and break .50 amperes at 600 volts.

*WE MANUFACTURE AND  
SELL ABOUT THIRTY  
DIFFERENT SIZES AND  
STYLES OF ELECTRIC HEATERS.*

Catalogues, Circulars and further information cheerfully furnished.

## GOLD STREET CAR HEATING COMPANY

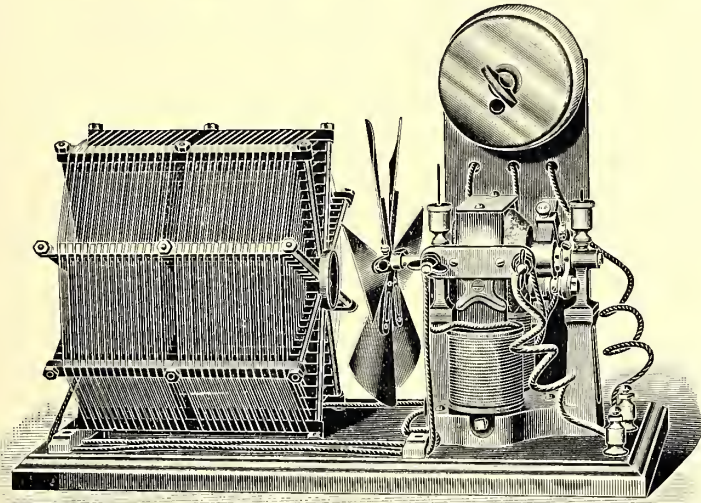
MAIN OFFICE

Frankfort and Cliff Streets, NEW YORK

BRANCH OFFICE

614 Rookery, CHICAGO, ILL.

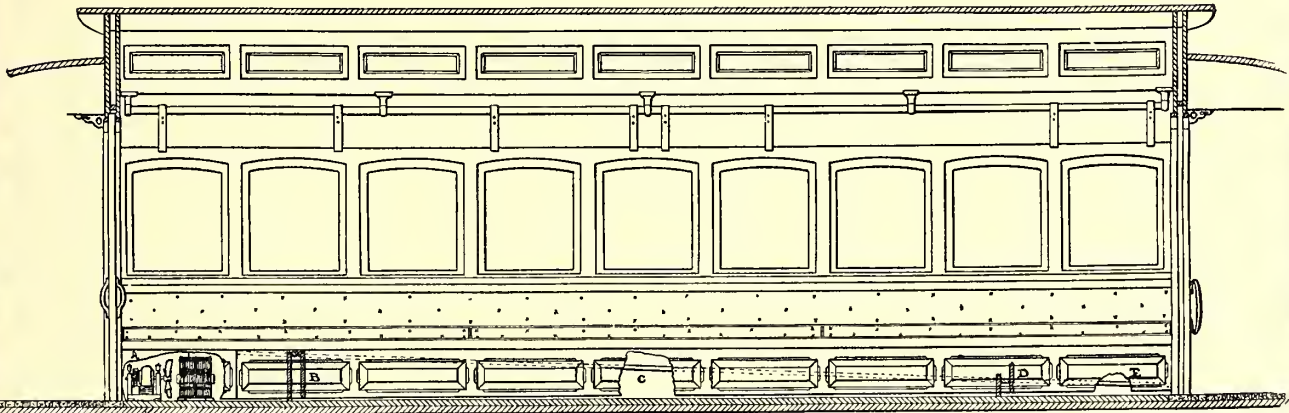
# A New Departure in ELECTRIC HEATERS FOR CAR HEATING



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Embodying *the Latest and Best Principles* to insure

**ECONOMY**  
**SAFETY**  
**DURABILITY**  
**CIRCULATION**  
**PURITY and**  
**GENERAL**  
**SATISFACTION**



SECTION OF CAR, SHOWING HEATER

**BAY STATE ELECTRIC HEAT  
*and* LIGHT COMPANY**

**286 Roxbury Street, Boston, U. S. A.**

**SEE OUR EXHIBIT AT THE CONVENTION, SPACE "H"**



**BUY IT  
USE IT  
RE=USE IT**

# IN ELECTRIC "CIRCULAR LOOM"

## ON SURFACE ELECTRIC ROADS

- TO PROTECT the controller cables running from one controller to another.
- TO PROTECT the cables running from controllers to motors.
- TO PROTECT the lead wires from the trolley to the light circuit cut-outs.
- TO PROTECT the wires from the trolley to the main cut-out and fuse box.
- TO PROTECT dynamo cables carried in ducts.
- TO PROTECT the car barn wiring.
- TO PROTECT wires and cables

**IN 101 PLACES**

**American Circular  
CHELSEA,**

NEW YORK:  
R. B. COREY, 26 Cortlandt Street



**ANYWHERE  
ANYWHERE  
ANYWHERE**

# RAILWAY WORK MAY BE USED

## ON ELEVATED ELECTRIC ROADS

- TO PROTECT the wires extending from the trolley shoe to the car body.
- TO PROTECT the wires running from the car body to the bottom of the resistance box.
- TO PROTECT wires passing through the transoms on double trucks.
- TO PROTECT wires extending from the bottom of the car to heater and light switches.
- TO PROTECT wires passing near any iron work on the car or wires exposed to the weather.
- TO PROTECT the repair shop wiring.
- TO PROTECT wires and cables

**ABOUT THE PLANT**

**Loom Company**  
MASS., U. S. A.

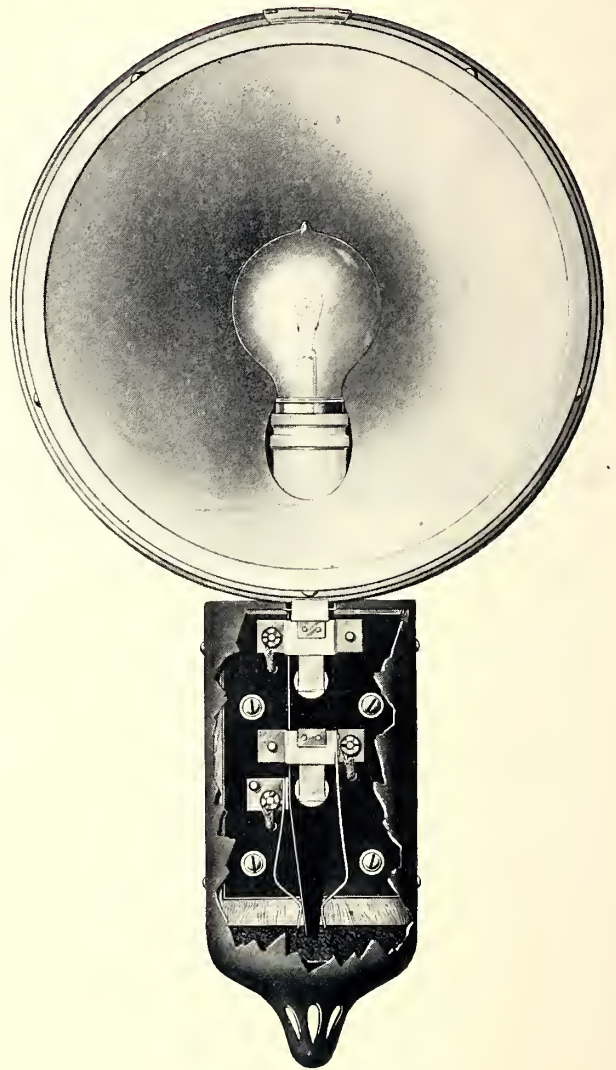
CHICAGO:  
THOS. G. GRIER, 128 W. Jackson Boulevard

# The SYRACUSE

## Change- able Head- light

For  
Trolley  
Cars

$\frac{1}{2}$  THE MONEY  
FOR TWICE THE  
EQUIPMENT



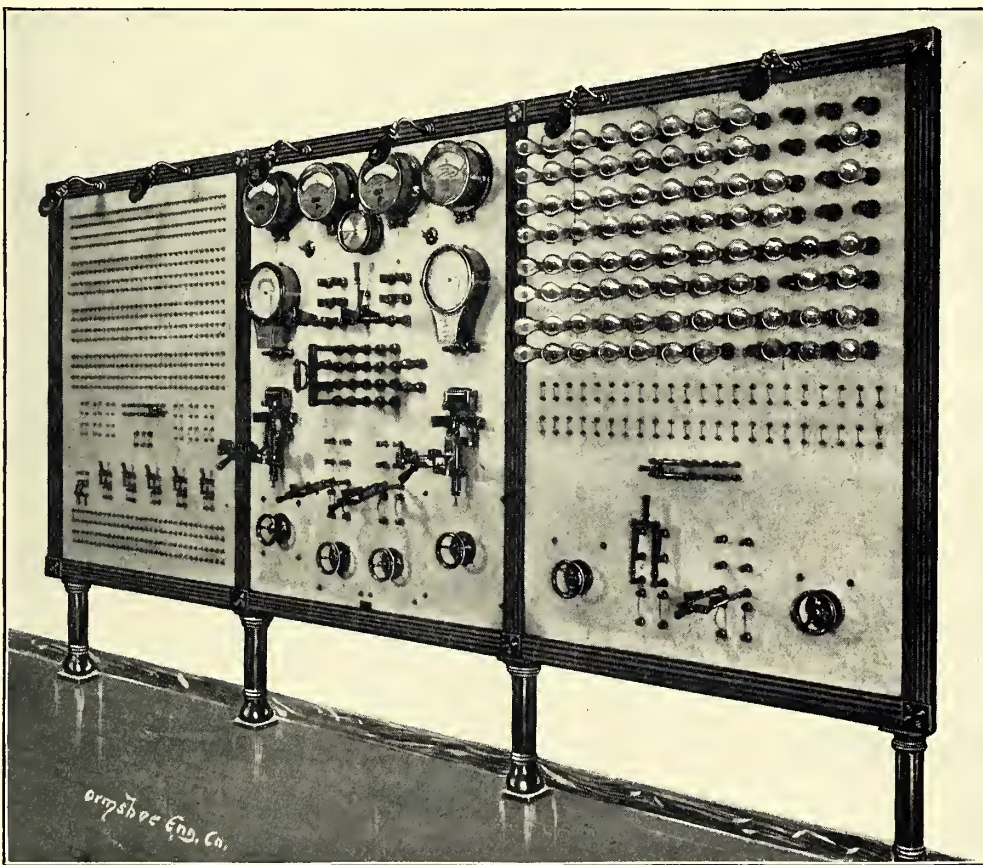
## CROUSE - HINDS

### Electric Company

New Catalogue  
on the press.  
Put your name on  
our mailing list.

Main Office and Works, Syracuse, N.Y., U.S.A.

# Switches, Panel Boards *and* Switch Boards For ALL REQUIREMENTS



## CROUSE-HINDS

Electric Company

Main Office  
*and* Works Syracuse, N.Y., U.S.A.

### Branches

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CHICAGO OFFICE, - 130 W. Jackson Bvd.  
BOSTON OFFICE, - New England Bldg.  
CINCINNATI OFFICE, Union Trust Bldg.  
SAN FRANCISCO OFFICE, - Mills Bldg.  
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Richmond, Va.

No. 1406. FRONT AND SIDE VIEWS



# NEAL ELECTRIC HEADLIGHT CO.

F. E. HUNTRESS, Manager.

“The Pioneers in the Electric Headlight Business”

The following list represents but a small portion of the many roads that have adopted them:

METROPOLITAN STREET RAILWAY CO., N. Y.  
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 BOSTON ELEVATED R. R. CO., Boston, Mass.  
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 CLEVELAND STREET RAILWAYS, Cleveland, O.  
 PITTSBURG STREET RAILWAYS, Pittsburg, Pa.

Write for our new illustrated catalogue

## F. E. HUNTRESS

General Eastern Agent

ST. LOUIS CAR COMPANY

## F. E. HUNTRESS & COMPANY

Manufacturers' Agents, Dealers and Exporters of

ELECTRIC RAILWAY SUPPLIES AND EQUIPMENT  
 CONSTRUCTION AND MAINTENANCE MATERIAL

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IRON, STEEL AND WOODEN POLES

SNOW PLOWS

OVERHEAD LINE MATERIAL

CAR WHEELS AND AXLES

BRACKETS AND POLE TRIMMINGS

SPIRAL JOURNAL BEARINGS

COPPER AND INSULATED WIRE

HEADLIGHTS

CAR SEATS

HIGH-GRADE CAR TRIMMINGS

Complete Line of Material for Electric Systems

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Telephone, No. 4553 Broad

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# THE DAYTON MANUFACTURING CO.

DAYTON, OHIO, U. S. A.

MANUFACTURERS OF

TRIMMINGS, LAMPS, ELECTROLIERS, Etc. For Steam and Street Railroad Cars  
KLING-LEAN and GRAVITY BRAKE HANDLES



The above scene is from a photograph taken at night on the road of the Southern Ohio Traction Company by the Light of a Wagenhals (Arc) Head-Light.

SELLING AGENTS FOR

**Wagenhals, Mosher, and Wellman (Arc) and Kirby-Neal patented Incandescent Head-Lights**

More than 1400 styles of Oil and Electric Head-Lights adapted for all kinds of service

SEND FOR CATALOGUE AND PRICES



# THE SAFETY CAR HEATING AND LIGHTING CO.

GENERAL OFFICE: 160 BROADWAY, NEW YORK

Branch Offices: { 1015 Union Trust Building, St. Louis  
 { 1017 Monadnock Building, Chicago

## PINTSCH SYSTEM CAR AND BUOY LIGHTING

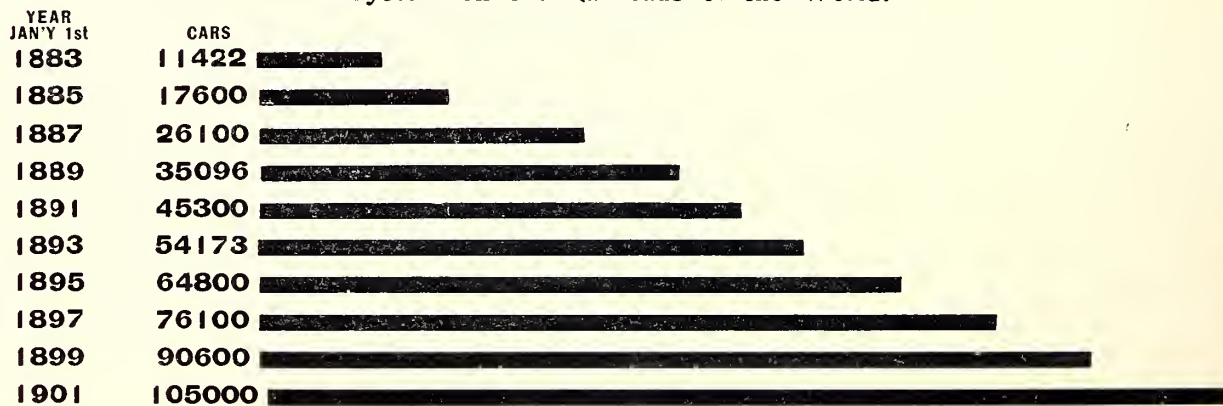
This company controls in the United States the celebrated Pintsch System of Car and Buoy Lighting. It is economical, safe, efficient and approved by railway managers and the Light House Board of the United States, and has received the highest awards for excellence at the World's Expositions at Moscow, Vienna, St. Petersburg, London, Berlin, Paris, Chicago and Atlanta. 105,000 cars, 4,500 locomotives and 1,150 buoys are equipped with this light.

154 railroads in the United States have adopted this system of lighting. Applied on over 17,000 cars.

## FOR STREET RAILWAY LINES

This system of lighting has also been adopted as the **standard light** by the Manhattan Elevated Railroad, the Broadway and Third Avenue Cable Lines of New York, the North and West Chicago and the Chicago City Railway Lines of Chicago; the Olive Street Railway of St. Louis; the Columbus Central Electric Line of Columbus, Ohio; the Metropolitan Street Railway of Kansas City, and the Denver Cable Lines of Denver, Colorado. These roads have over 3,000 cars equipped with this light.

A Graphical Illustration of the Progress made in the Application of the Pintsch Lighting System on the Railroads of the World.



## CAR HEATING

By Steam Jacket System of hot water circulation, regulating direct steam system, return and single train pipe systems.

105 railroads in the United States are using these systems of heating. Applied on over 9,000 cars.

AUTOMATIC STEAM TRAPS

STRAIGHT PORT COUPLERS

# ELECTRIC HEATERS

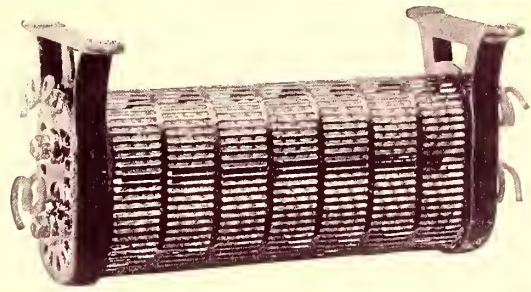
Theoretically } **Perfect**  
Practically }

Sold under a FIVE YEAR guarantee

RECORD: Heating equipments after eight years service are still Efficient and Satisfactory

ADOPTED BY THE MANHATTAN RAILWAY, NEW YORK CITY

**CONSOLIDATED CAR-HEATING CO., ALBANY, N. Y.**



**“H. W. J.”**

## Electric Heaters

Are illustrated in our advertisement on page 198 of this issue.

H. W. JOHNS M'F'G CO.,

100 WILLIAM STREET, - NEW YORK.

### THE SIMPLEX ELECTRICAL COMPANY,

MANUFACTURERS,

Under the patents of the American Electric Heating Corporation, of  
**ENAMEL CAR HEATERS AND COIL SPRING CAR HEATERS.**

A variety of designs to meet all requirements. Send for Catalogue.

The Simplex Electrical Company,

Chicago Office:

Cambridgeport, Mass.

Monadnock Block

Our Catalogue of

*Street Railway and*

*Electrical Books*

is yours for the asking.

STREET RAILWAY JOURNAL,  
120 Liberty St., New York.

## BAKER HOT WATER HEATERS FOR ELECTRIC CARS.



Positively Non-Freezing.

Cheaper, More Constant, Satisfactory and Agreeable than Electricity.

Various Sizes.

Simple but Perfect in Operation.

Hot Water Pipes run around the car and at the feet of every passenger. The Heater proper may project half-way, or be placed entirely within the vestibule, and thus keep the motor-man warm, and his windows free from frost.

In use on the Detroit, Ypsilanti and Mt Clemens Railway Co., Ann Arbor, Mich.; Detroit, Lake Shore and Mt. Clemens Railway Co., Detroit, Mich.; Twin City Rapid Transit Co., Minneapolis, Minn.; Milwaukee Electric Railway and Light Co., Milwaukee, Wis.; Waterloo and Cedar Falls Rapid Transit Co., and others.

Manufactured and Sold Only by

**William C. Baker,**

143 LIBERTY ST.,  
New York, U. S. A.

Type of Baker Heater used in large Electric Cars.

## PETER SMITH HEATER

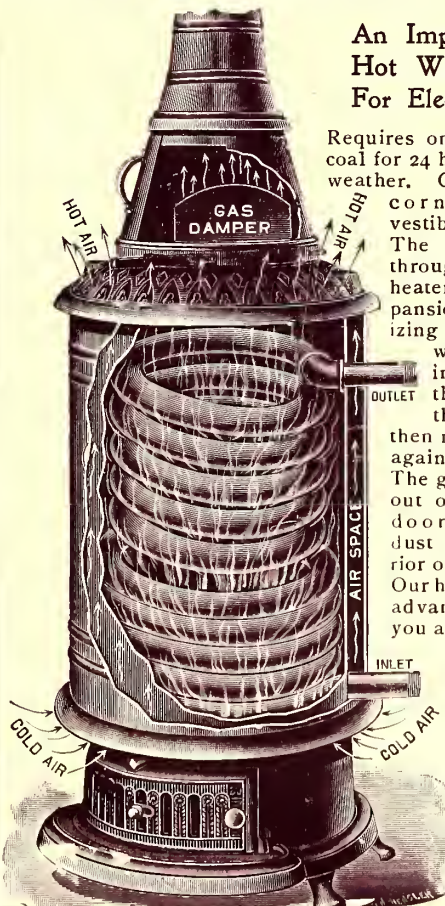
An Improved Hot Water Heater For Electric Cars

Requires only about 75 lbs. of coal for 24 hours in the coldest weather. Can be carried in a corner of car or in vestibule.

The hot water passes through a coil tube in the heater, thence to an expansion tank for equalizing the pressure, from which point it travels in pipes throughout the car at the feet of the passengers and then returns to the heater again.

The grate is shaken without opening the ash pit door, thus preventing dust from flying in interior of car.

Our heater has many other advantages. Let us tell you about them.



**Peter Smith Heater Co.**

Detroit, Mich.  
U. S. A.



**THE BEST HEADLIGHT IS NONE TOO GOOD  
WE MAKE THE BEST  
IT IS GOOD ENOUGH FOR ANYBODY**

WIRES ENTER FROM BACK OR FROM BOTTOM OF CASE

10 1/2 Inch Parabolic Reflector  
Malleable Iron Case

Brass Door and Hinge  
Projects But 4 1/2 Inches

**MANY THOUSANDS IN USE TESTIFY TO THEIR MERIT**

In Ordering State What Base Lamp is Used

**WHEELER REFLECTOR CO.**

100 Purchase St., BOSTON, MASS.

<p><b>THE DRESSER RAIL- HEADLIGHTS of</b></p> <p>3876 - 3878 PARK SOUTHERN REPRESENTATIVES, R. J. ROUSE &amp; CO., RICHMOND, VIRGINIA</p>		<p><b>WAY LAMP WORKS,</b> AVE., NEW YORK. <b>Every Description.</b></p> <p>CHICAGO OFFICE, 934 THE MONADNOCK</p>
---	--	--

<p><b>BENT GLASS</b></p>	<p><b>FOR RAILWAY CARS</b> Largest exclusive Glass Bending Works in the World.</p>	<p><b>ORIEL GLASS CO.</b> ST. LOUIS, MO.</p>
--------------------------	--	--

**“FEMCO” INCANDESCENT LAMPS**

FOR  
**STREET RAILWAY SERVICE**

ON THE CARS, IN THE POWER HOUSE,  
FOR STREET LIGHTING GIVE SATISFAC-  
TION, LONG LIFE AND ECONOMY.

*OUR GUARANTEE FOLLOWS OUR LAMPS*

 **The Franklin Electric Manufacturing Co.**  
HARTFORD, CONN.  
Complete stock at 219 Havemeyer Building, New York

# Columbia Machine Works

## SPECIALTIES



Car Sign Attached



Car Sign Detached

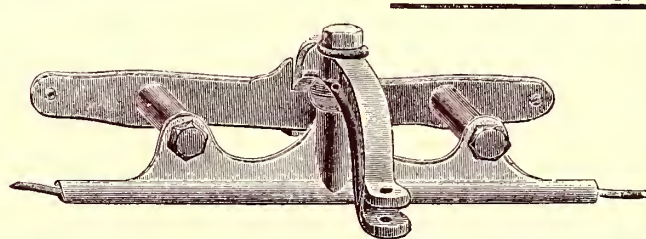
We are the sole manufacturers of

### The Millen Illuminated Car Sign

now in use on all the cars of the Metropolitan and Union Street Railway Companies of New York, as well as many other street railways.

### The Columbia Patent Strain Line Anchor

is also in use by many of the leading street railways and by actual tests has proved to fulfill all we have claimed for it.



Columbia Patent Strain Line Anchor

We manufacture all kinds of street railway supplies and have extensive facilities for the filling of orders promptly.

## Columbia Machine Works

18 FULTON STREET, BROOKLYN, N. Y.

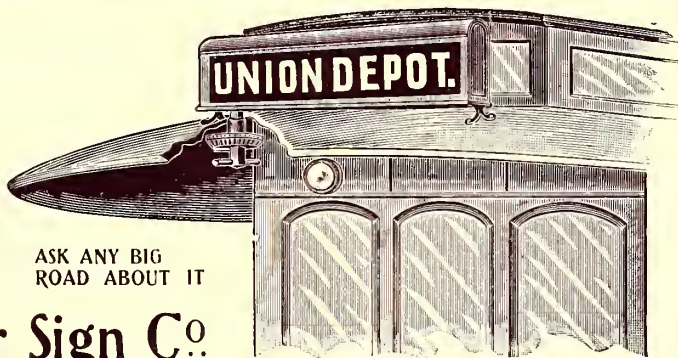
## THE ONLY PERFECT CAR SIGN

*Equally useful day and night*

When ordering cars don't fail to specify The Hunter Sign

## The Hunter Illuminated Car Sign Co.

Commercial Tribune Bldg., CINCINNATI, OHIO :: Lytle J. Hunter, Secy.



ASK ANY BIG ROAD ABOUT IT

EASTERN REPRESENTATIVES : MORRIS ELECTRIC CO., 15 Cortlandt St., N. Y.

WESTERN REPRESENTATIVES : MCGILL, PORTER & BERG, 309 Dearborn St., Chicago

## THE HENDERSON CAR SIGN ILLUMINATOR

A Day or Night Sign

The Strongest and Cheapest on the Market  
See Illustration on Page 183

**U. S. ELECTRIC SIGNAL CO.**  
49 GALEN ST., WATERTOWN, MASS.

## Special Series Burning Railway Lamps

ARE ONE OF OUR SPECIALTIES.

**PENNSYLVANIA ELECTRICAL AND RAILWAY SUPPLY CO.**

THIRD STREET AND PENN AVENUE, PITTSBURG, U. S. A.

See our page in Section VI.



FOR CAR SEATS, CAR CURTAINS, HEAD LININGS USE

# PANTASOTE

Exactly resembles morocco leather, costs half as much and endures longer.

Waterproof, Stain proof, grease proof and odorless.

Will not rot, crack or stiffen; is not affected by heat or cold.

Contains no rubber or cellulose; unlike its cellulose imitations its surface will not burn.

Made in plain leather grains or in richly embossed patterns for seats, panels head linings.

ALL STANDARD COLORS.



Used for ten years by leading Railways in this Country and Europe.

Awarded the Edward Longstreth Medal of Merit as the "only satisfactory substitute for leather" by Franklin Institute.

Awarded first prize at Philadelphia Exposition, 1899.

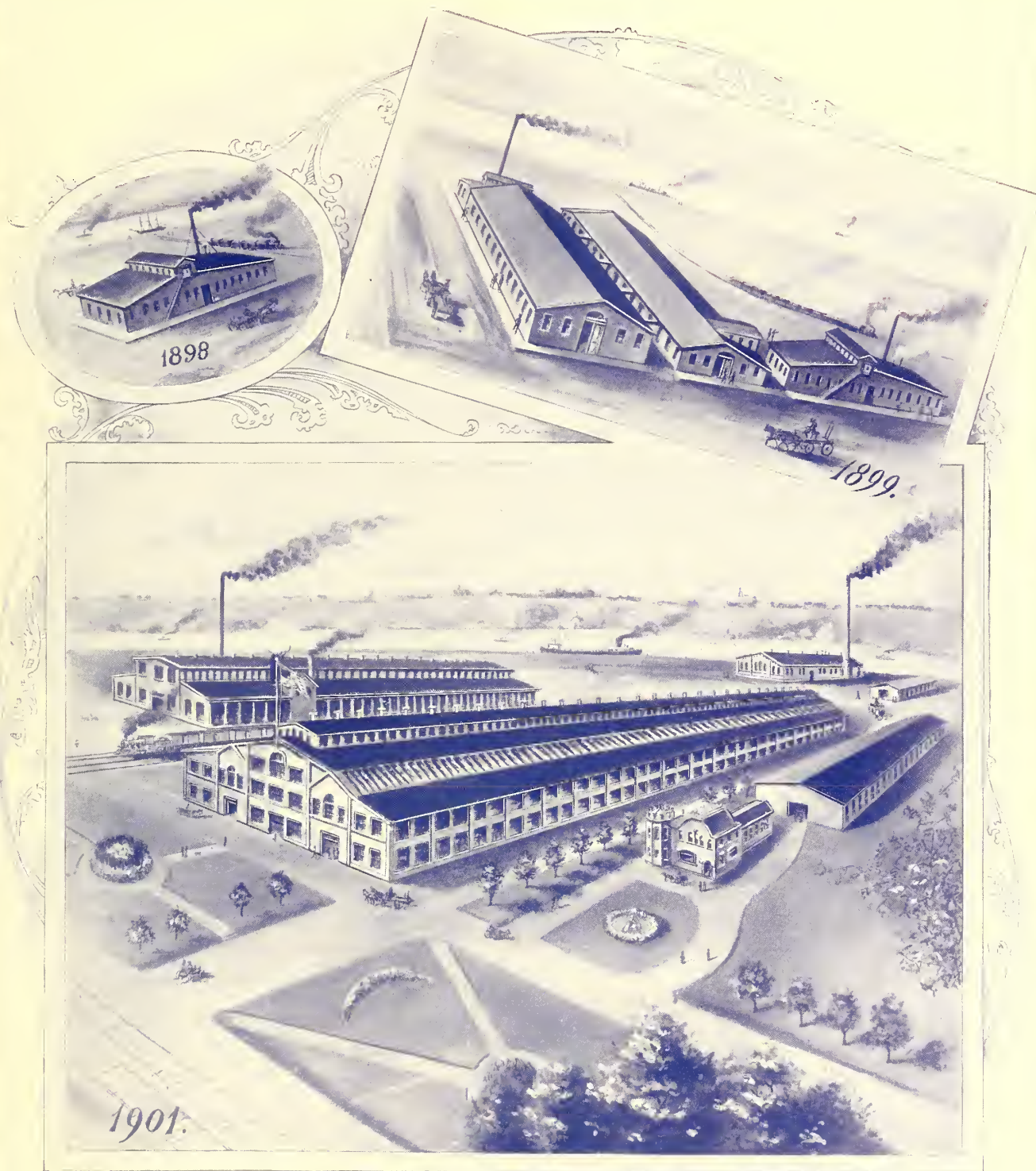
Adopted by U. S. Government for upholstering ambulances.

Material for shades and curtains is double textile face, figured or plain.

CAUTION! There are worthless and dangerous imitations. Genuine has "Pantasote" stamped on the goods.

**PANTASOTE COMPANY, - 29 BROADWAY, N. Y. CITY.**

The Largest and most completely equipped plant in the World devoted to the manufacture of Air Brake Equipments for Electric Roads



GENERAL OFFICE, WORKS AND FOUNDRY,

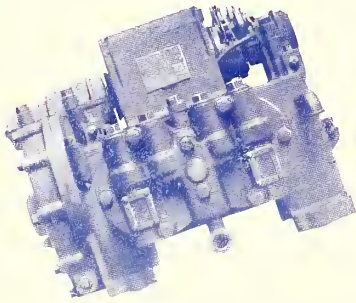
# CHRISTENSEN ENGINEERING CO.

... MILWAUKEE ...

F. C. RANDALL, Manager Eastern Department, 135 Broadway, New York.

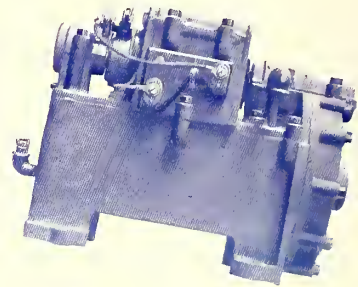
# CHRISTENSEN AIR BRAKES

Have enabled electric roads to rival steam roads in the important features of speed and safety



## 1684

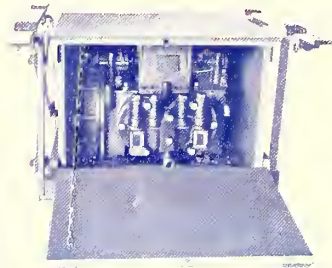
of these independent motor driven equipments are in standard service in Philadelphia Chicago and Buffalo



OVER 175

COMPANIES

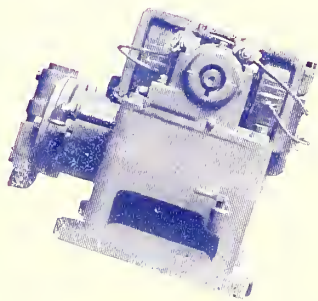
USE THEM



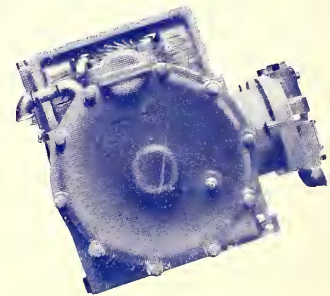
MANY OF WHICH

HAVE EQUIPPED ALL

OF THEIR CARS



Don't fail to see apparatus in actual operation at the Convention



There are many more Christensen Air Brakes in standard service in the State of New York alone than there are of all other makes in the entire world

## CHRISTENSEN ENGINEERING CO.

MILWAUKEE CABLE ADDRESS  
CECO

MANUFACTURERS OF AIR BRAKES  
General Office MILWAUKEE Works and Foundry

LONDON CABLE ADDRESS  
FANABITS

REPRESENTATIVES:

R. W. BLACKWELL & CO., London, Brussels and Paris  
HENRY PELS, Berlin, Edge and Edge, Sydney

W. A. PARKER, Manager European Dept., 59 City Road, London  
F. C. RANDALL, Manager Eastern Dept., 135 Broadway, N. Y.

New York Warehouse: 410-412 West 13th Street

# CHRISTENSEN AIR BRAKES

Are now in practical operation on 95% of all the cars that are equipped with air brakes



MACHINE DEPARTMENT

2000 Independent Motor Compressor Equipments are now in the course of construction and all future orders can be promptly filled from our warehouses

## CHRISTENSEN ENGINEERING CO.

MILWAUKEE CABLE ADDRESS  
CECO

MANUFACTURERS OF AIR BRAKES  
General Office **MILWAUKEE** Works and Foundry

LONDON CABLE ADDRESS  
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New York Warehouse: 410-412 West 13th Street.



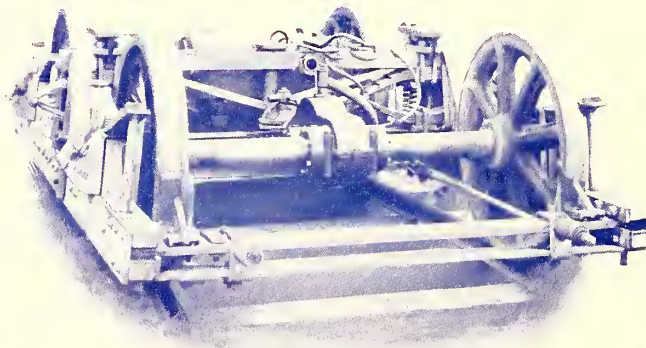
# KNELL AIR-BRAKE SYSTEM

## Combines Simplicity and Strength, Light Weight and Durability

Our New Axle-Driven Compressor meets fully the requirements of a Simple and Efficient Air Brake for City and Suburban Service. It can be applied to maximum traction trucks, with pony wheels of any dimension in use.

ELECTRIC DRIVEN COMPRESSORS, STATIONARY AIR COMPRESSORS, ETC.

See Our  
Exhibit at  
Madison  
Square  
Garden,  
New York  
October 9-11



Send for  
Copy of our  
New  
Illustrated  
Catalogue

THE ABOVE ILLUSTRATION SHOWS ONE OF THE 38 KNELL AIR BRAKE EQUIPMENTS BOUGHT BY THE BIRMINGHAM RAILWAY, LIGHT AND POWER CO., WHO HAVE PLACED THREE ORDERS WITH US WITHIN 10 MONTHS

THE INSTANTANEOUS ACTION AND REMARKABLY LIGHT WEIGHT OF OUR AUTOMATIC SUCTION AND PRESSURE REGULATING VALVE ARE WORTH YOUR CAREFUL CONSIDERATION

**Every Road using Knell Air Brakes will furnish  
Highest Testimonials as to Their Efficiency**

## THE KNELL AIR-BRAKE COMPANY.

OFFICE: 3-4 THOMAS BLOCK, BATTLE CREEK, MICH.

A. H. METZELAAR, GEN. SUPT. FACTORY: BATTLE CREEK, MICH

### U.S. AND FOREIGN PATENTS

# THE G. P. MAGANN Storage Air Brake System

THE ONLY STORAGE AIR BRAKE SYSTEM EVER APPLIED TO CARS.  
BOTH AUTOMATIC AND STRAIGHT AIR.

Among other Contracts for Equipments lately made, we have completed arrangements for the equipment with our Storage Air Brake System, of the ENTIRE SERVICE of the UNITED RAILWAY COMPANY OF DETROIT, being ALL the lines of the City of Detroit Electric Railways, and have equipped FOUR complete divisions of this Company's road.

OUR LAST LARGE CONTRACT for air brakes has recently been closed with the EVERETT-MOORE SYNDICATE of Cleveland, Ohio, under which we supply all the power brakes required over 1400 miles of their railways.

Perfect operation and low cost of maintenance secured for us, as AGAINST ALL COMPETITORS, these equipments.

---

The New York State Railroad Commissioners, in their Official Competitive Tests, awarded the First Place of Merit of all Air Brakes to the G. P. Magann Air Brake Company, Ltd., the only manufacturers of STORAGE AIR BRAKES. United States and Foreign Patents.

Send for Catalogue.

## The G. P. Magann Air Brake Co.

LTD.

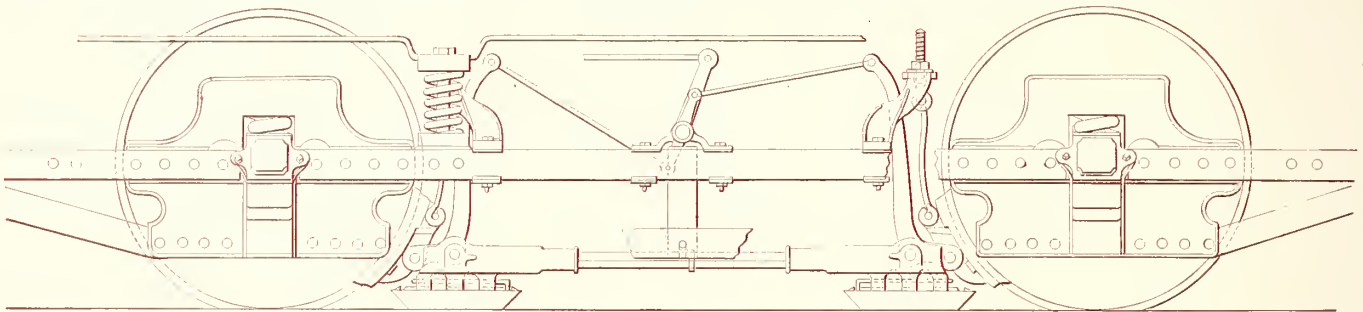
Office and Factory, 4th and PORTER STREETS  
DETROIT, MICH.

## A Few Points of Superiority of The **ROTE TRACK BRAKES**

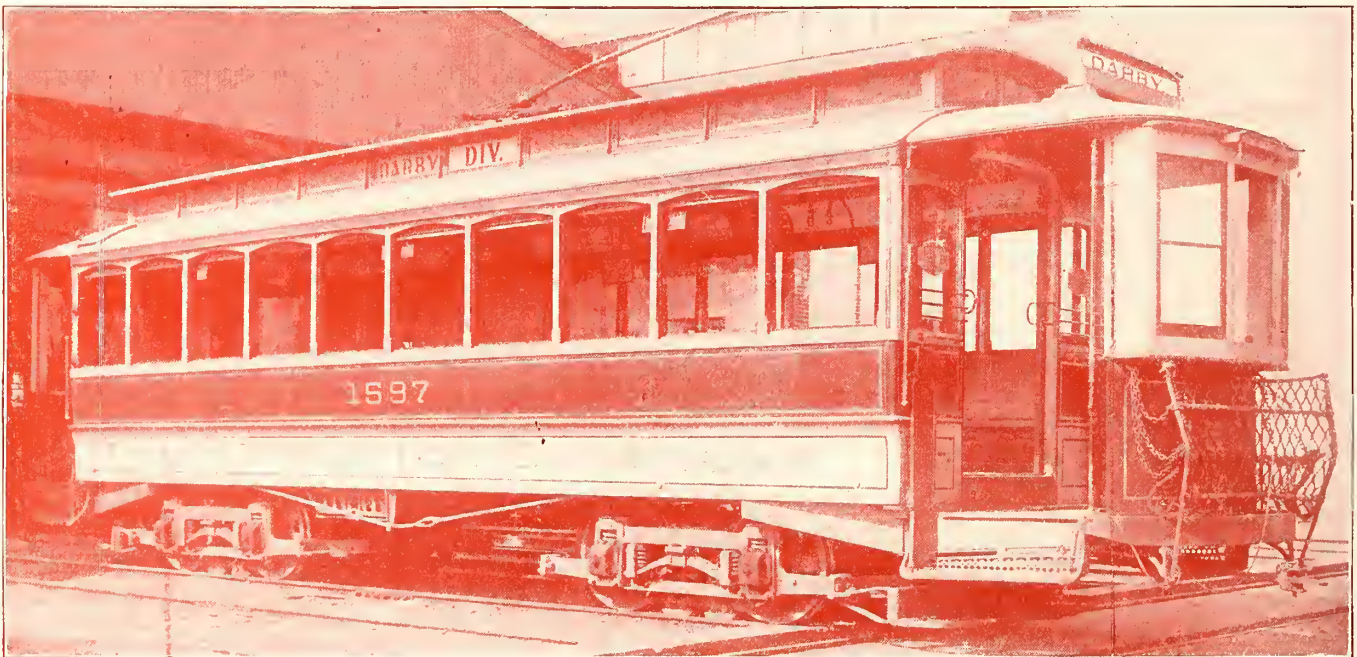
Will prevent at least 75 per cent of the accidents now due to wheel brakes, even if the latter be operated by the different mechanical devices now on the market, which render the wheel brakes less reliable and more expensive to maintain.

It is impossible to **SKID** a car with the **ROTE TRACK BRAKES**; therefore **SAND** is not necessary for stopping, and **FLAT WHEELS** are a thing of the past.

No matter in what condition the rail may be, these brakes are always **SURE** to control perfectly and with ease the stopping of any size or style of cars, by the use of the regular hand brake-staff.



**PRACTICAL, SAFE, EFFICIENT and ECONOMICAL**



The Rote Brake consists of shoes on the wheels and track, so constructed that contact is made with both wheels and track at the same time. After the brake is applied the pressure is automatically taken from the wheels and put on the track, thus preventing the wheels from sliding and becoming flat, and making it possible to handle the car with ease on a gummy or greasy rail.

Can be applied to any truck; is easy to adjust and keep in repair. Will operate perfectly on switches, curves and cross-overs. Have proved successful in practical operation, and are being installed in leading cities. For further particulars address,

**The Rote Track Brake Co.**  
LANCASTER, PA., U. S. A.

Here is a little Brake advertisement that is not so modest as it looks at first glance

The only excuse for any Street Railway to install any power brake other than the Neal Duplex Brake, is ignorance of the merits of that brake.

Send for Catalogue.

**UNITED STATES STEEL CO.**

BRAKE DEPARTMENT

145 Oliver Street, Boston, Mass.

## Standard Traction Brake Co.

The Westinghouse Electric Brake and Car Heating Apparatus more nearly approximates the ideal brake for electric cars than any other appliance heretofore invented.

The Westinghouse Air Brake Co.  
MANUFACTURERS

See Westinghouse Advertisements in Every Section of this Book.

## JOHN FINN METAL WORKS

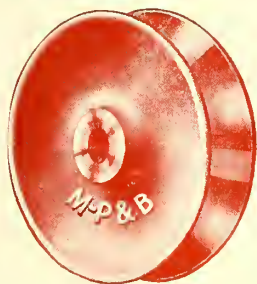
313-315 Howard St., San Francisco, Cal.

MANUFACTURERS OF ALL GRADES OF

**BABBITT METALS  
ARMATURE METALS**

For Motor and Electric Car Bearings

USED EXCLUSIVELY BY ALL THE  
ELECTRIC CARS OF SAN FRANCISCO



4-inch WHEEL, 2½ lbs.  
Made of Best Bronze Metal.

Trolley Supplies  
Line Supplies  
Feeder Supplies  
Station Supplies  
Car Supplies  
Track Supplies

WRITE US FOR PRICES

**PORTER & BERG**

309 DEARBORN ST., CHICAGO.

**OUR TROLLEY WHEELS  
ARE GOOD WHEELS**

SEE PAGE 215 OF THIS ISSUE

**EUREKA TEMPERED WORKS**  
COPPER . . .

NORTHEAST, PA.

The Original and Genuine

# “Bound Brook Bushings”

FOR TROLLEY WHEELS

**RUN WITHOUT OIL OR GREASE**

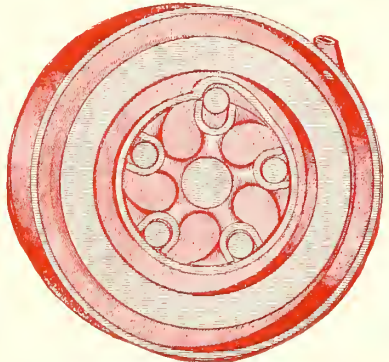
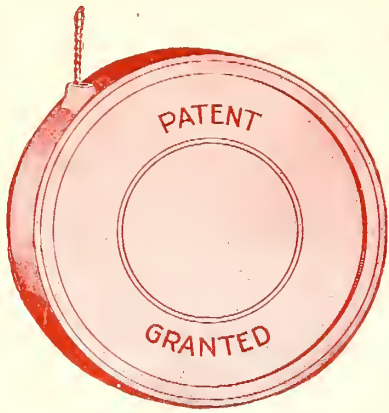
and are well known  
all over the world

MANUFACTURED ONLY BY

**The Graphite Lubricating Co.**

BOUND BROOK, N. J., U. S. A.

Also all kinds of Machinery Bearings, Bushings and Washers to run with or without oil.



LOCKING DEVICE

**I**F the trolley jumps the wire one of the balls will instantly fly up in the pocket and lock the reel.

Any device that requires, and can be adjusted, is sure to require, and will get out of adjustment.

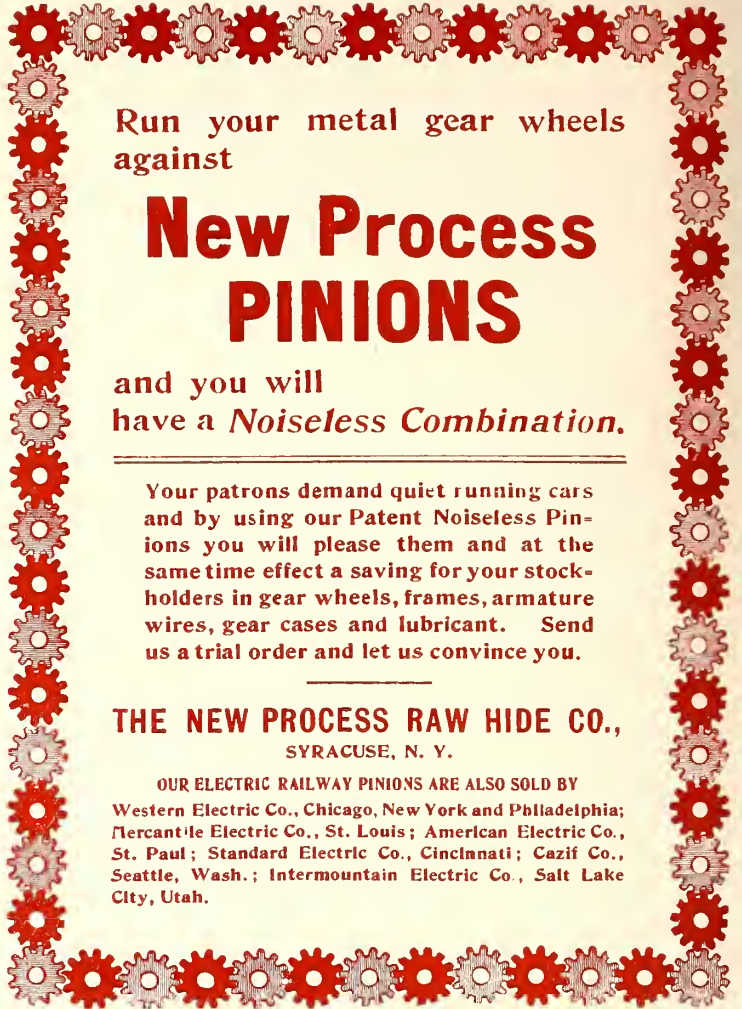
There never was a spring made that retained its adjusted tension for any great length of time.

Up to the present time, no device known as a trolley catcher has been put on the market in which the locking device is not governed by a spring or springs, and require a fine adjustment.

In the Trojan Trolley Catcher, there are no spring—controlled locking devices or adjustments. It cannot be adjusted, for there is no adjustment to it.

There is but one way for it to work and you cannot work it any other.

**The Trojan Trolley Tender Co.**  
TROY, NEW YORK, U. S. A.



Run your metal gear wheels against

# New Process PINIONS

and you will have a *Noiseless Combination.*

Your patrons demand quiet running cars and by using our Patent Noiseless Pinions you will please them and at the same time effect a saving for your stockholders in gear wheels, frames, armature wires, gear cases and lubricant. Send us a trial order and let us convince you.

**THE NEW PROCESS RAW HIDE CO.,**  
SYRACUSE, N. Y.

OUR ELECTRIC RAILWAY PINIONS ARE ALSO SOLD BY  
Western Electric Co., Chicago, New York and Philadelphia;  
Mercantile Electric Co., St. Louis; American Electric Co.,  
St. Paul; Standard Electric Co., Cincinnati; Cazif Co.,  
Seattle, Wash.; Intermountain Electric Co., Salt Lake  
City, Utah.



## HORSBURGH & SCOTT

MANUFACTURERS OF

### GEARS AND PINIONS

CLEVELAND, O.



**GEARS & PINIONS**  
PROMPT SHIPMENTS

The Simmonds Mfg Co.

**PITTSBURG, PA.**

Prompt Attention Given to all Correspondence.

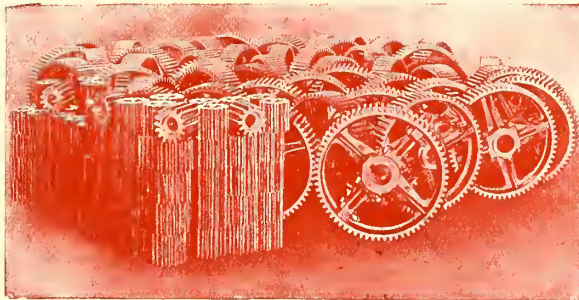
OPEN HEARTH  
CAST STEEL CUT  
**GEARS**

U. S.  
PROJECTILE BRAND  
**Gears and Pinions**

PATENT PRESSED  
HIGH CARBON STEEL  
**PINIONS**

FOR ALL ELECTRIC SYSTEMS

ACCURACY  
UNIFORMITY  
TOUGHNESS  
AND GOOD WEARING  
QUALITIES ARE  
PRODUCED  
BY OUR  
METHODS



USED FOR  
EIGHT YEARS  
BY THE LARGEST  
ST. R. R's. IN THE U. S.  
AND CANADA.

HIGHEST IN CARBON.  
LONGEST IN  
LIFE.

ARMATURE  
SLEEVES.  
FORGINGS

The **United States Projectile Co.**

OFFICE AND WORKS: FIRST AVE. AND 53d ST.,

Borough **BROOKLYN**  
**NEW YORK**

Cable Address  
"Projectile"  
Brooklyn.

SELLING AGENTS:  
**ECCLES & SMITH,**  
SAN FRANCISCO, CAL.  
**THE W. R. GARTON CO.**  
CHICAGO, ILL.



**KALAMAZOO TROLLEY WHEEL**

Our new method of treating copper produces a metal unequalled for this purpose—soft and long-lived.

Will run in sleet longer than any other. Self-oiling, and therefore saves bushings. Actual service proves superiority. Will not injure wire. Better conductor and not complicated.

**THE STAR BRASS WORKS (INCORPORATED), KALAMAZOO, MICH.**



**A Perfect Trolley Harp**  
Every Electric Road Needs It  
Every car man wants one  
**We have it**



The Economic Trolley Harp meets all practical requirements. Recent exhaustive tests prove it. An experienced street railway manager has spent years perfecting the Economic Trolley Harp. It saves time, expense and an immense amount of worn and broken wire, by keeping a correct position on the wire. The extra cost is nominal. Write us.

**ECONOMIC M'F'G COMPANY, SPRINGFIELD, OHIO**



**E**VERY UNION STANDARD TROLLEY in use was made by us. If you know how many Street Railway equipments were sold during the past twelve months, you know the exact number of Trolleys we have made.

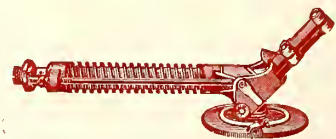
The worth of the Gears and Pinions made by us is fully equal to that of our Trolleys. All the Gears and Pinions turned out by us during the past year would make a pile 15,000 feet high and two feet in diameter. ...

Popularity is proof of merit.

Our Gears, Pinions and Bearings are made of the best material obtainable and rigidly tested and inspected.

Individual (steel) billets, hammered to size, are used in making our Steel Pinions. This is a method original with us.

Standard types shipped from stock.



WRITE FOR CATALOGUE

**R. D. Nuttall Company, Pittsburg, Pa.**

3

GOOD


 WILSON  
TROLLEY  
POLE  
CATCHER

 KILBOURN  
TRACK  
SANDING  
DEVICE

 WELD  
BABBITTING  
DEVICE

CARDS

**T**HE STREET RAILWAY COMPANY THAT IS not using the Wilson Trolley Pole Catcher is, perhaps unwittingly but none the less effectively, cutting off its own nose.

Economy and good business methods demand the use of the best.

The Wilson Trolley Pole Catcher is the best and most practical device for the prevention of breakage of trolley poles, trolley cords and damage to overhead construction.

It will increase the effectiveness of your service, save the time of your employees and reduce your expenses for repairs.

It is a good card to hold if you want to make your road all that it should be and could be.

**T**HE KILBOURN TRACK SANDING DEVICE distributes any kind of sand, fine or coarse, wet or dry, with equal ease and precision.

It is simple in operation.

The pressure of the motorman's foot does the business.

It puts on enough and yet not too much.

It is a very economical device, too.

Better sand your track with the Kilbourn, increase your mileage per pail of sand, and decrease your expenditures.

Railroad Managers who have tried it say they would not be without the Kilbourn for a farm.

It is another good card to hold if you want to make your road all that it should be and could be.

**T**HE WELD BABBITTING DEVICE IS OUR newest production.

This machine will babbitt axle bearings so that they come from the forms ready for use, requiring absolutely no machine work.

This is a strong statement, but we are prepared to back it up and we shall show these machines in our exhibit at the Convention.

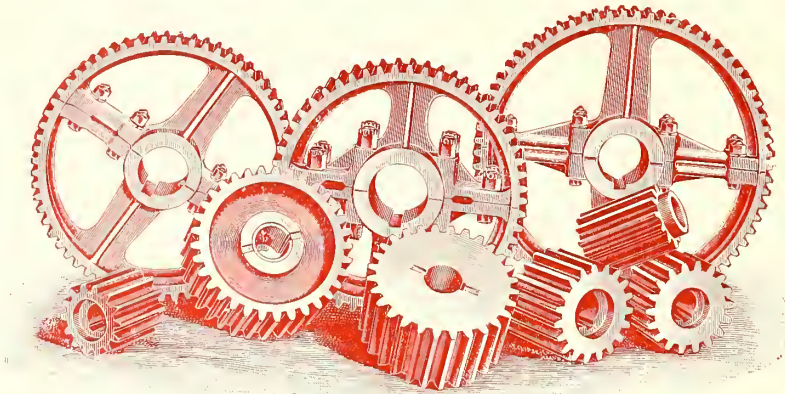
This advice saves time, labor and metal, and will babbitt more boxes per hour than any device heretofore put on the market.

The third good card that you should hold to make your road all that it could be.

**FRANK RIDLON CO., 200 Summer St., Boston, Mass.**



# THE VAN DORN & DUTTON CO.



Highest Quality. For all Types of Motors.

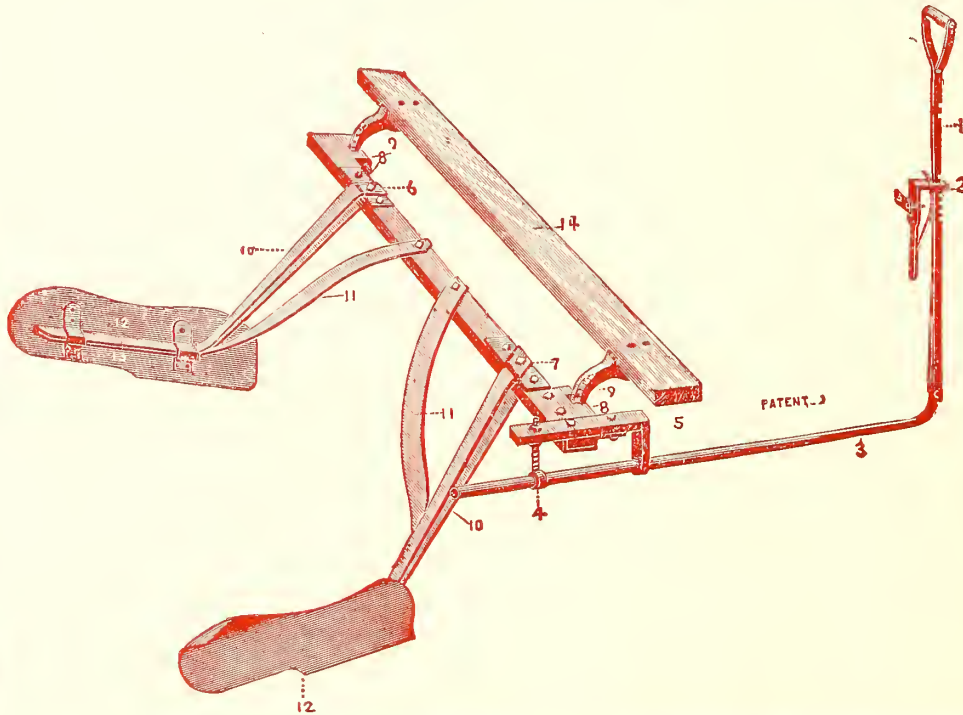
Manufacturers of

Open Hearth Steel  
**GEARS**

and

Hammered Steel  
**PINIONS**

**CLEVELAND, OHIO**



The  
Van Dorn & Dutton Co.

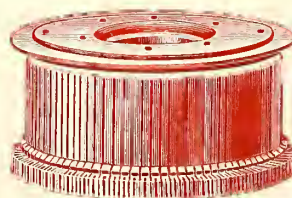
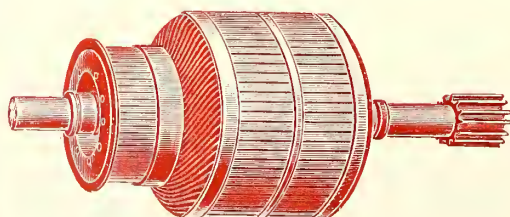
**TRACK  
CLEANERS**

are the Standard Cleaners, in use on over 300 Railways.

Now is the time to specify them for your new cars.

# THE VAN DORN-ELLIOTT ELECTRIC CO.

**CLEVELAND, OHIO**



Armature Winding and Building.  
Commutator Filling and Building.  
Transformers and Fields of all types  
Rewound.

**ARMATURE COILS**

... THE ...

# PROVIDENCE CAR FENDER

SAVES HUMAN LIVES.



... MANUFACTURED BY ...

## THE CONSOLIDATED CAR FENDER CO.

FACTORY:  
PROVIDENCE,  
R. I.

OFFICE:  
39 & 41 CORTLANDT ST.,  
NEW YORK.

## THE FOLLOWING IS A PARTIAL LIST OF ROADS USING PROVIDENCE CAR FENDERS

- Albany Railway, Albany, N. Y.  
 Albany & Hudson Railway & Power Co., Hudson, N. Y.  
 Allentown & Lehigh Valley Traction Co., Allentown, Pa.  
 Alton Railway & Illuminating Co., Alton, Ill.  
 Altoona & Logan Valley Electric Ry. Co., Altoona, Pa.  
 Amsterdam Street Railway Co., Amsterdam, N. Y.  
 Atlantic Highlands, Red Bank & Long Branch Electric Railway,  
 Red Bank, N. J.  
 Auburn City Ry. Co., Auburn, N. Y.
- Bellows Falls & Sexton's River Railway Co., Bellows Falls, Vt.  
 Bennington & Hoosic Valley Ry. Co., Hoosic Falls, N. Y.  
 Binghamton R. R. Co., Binghamton, N. Y.  
 Bradford Electric Street Railway Co., Bradford, Pa.  
 Bridgeport Traction Co., Bridgeport, Conn.
- Cairo Electric Ry. Co., Cairo, Ill.  
 Carbon County Electric Railway Co., Mauch Chunk, Pa.  
 Central Ry. & Electric Co., New Britain, Conn.  
 Cincinnati, Lawrenceburg & Aurora St. Ry. Co., Cincinnati, O.  
 Cincinnati & Hamilton Electric Ry. Co., Cincinnati, O.  
 Citizens' Rapid Transit Ry. Co., Nashville, Tenn.  
 Citizens' Street Ry. Co., Fishkill-on-Hudson, N. Y.  
 City Electric Ry. Co., Port Huron, Mich.  
 City Passenger Ry. Co., Altoona, Pa.  
 City Street Car Co., Staunton, Va.  
 Cleveland, Berea, Elyria & Oberlin Ry. Co., Cleveland, O.  
 Cleveland Electric Ry. Co., Cleveland, O.  
 Cleveland, Painesville & Eastern R. R. Co., Cleveland, O.  
 Cleveland & Chagrin Falls Electric Ry. Co., Cleveland, O.  
 Cleveland & Eastern Ry. Co., Cleveland, O.  
 Columbus, Buckeye Lake & Newark Railway Co., Columbus, O.  
 Columbus, Springfield & London Railroad Co., Columbus, O.  
 Connecticut Lighting & Power Co., Bridgeport, Conn.  
 Connecticut Lighting & Power Co., Norwalk, Conn.  
 Consolidated Street Ry. Co., Grand Rapids, Mich.  
 Consolidated Traction Co., Jersey City and Newark, N. J.
- Dayton, Springfield & Urbana Electric Ry. Co., Dayton, O.  
 Dayton & Western Ry. Co., Dayton, O.  
 Derby Street Railway Co., Derby, Conn.  
 Des Moines City Ry. Co., Des Moines, Ia.
- Electric Construction Co., Portsmouth, Va.  
 Electric Construction Co., Richmond, Va.  
 Elizabeth City Horse R. R. Co., Elizabethport, N. J.  
 Elizabeth City R. R. Co., Elizabeth, N. J.
- Fairhaven & Westville R. R. Co., New Haven, Conn.  
 Fall River Street Ry. Co., Fall River, Mass.  
 Fitchburg & Leominster Street Ry. Co., Fitchburg, Mass.  
 Fonda, Johnstown & Gloversville R. R. Co., Gloversville, N. Y.  
 Fort Wayne Traction Co., Fort Wayne, Ind.
- Hartford St. Ry. Co., Hartford, Conn.  
 Hartford & West Hartford H. R. R. Co., Hartford, Conn.  
 Herkimer, Mohawk, Ilion & Frankfort Elec. Ry. Co., Mohawk,  
 N. Y.  
 Hornellsville Electric Railway Co., Hornellsville, N. Y.  
 Hull Electric Co., Hull, Quebec.
- Indianapolis, Greenwood & Franklin R. R. Co., Greenwood, Ind.
- Interstate Consolidated Street Ry. Co., North Attleboro, Mass.  
 Jackson Street Ry. Co., Jackson, Mich.
- Lake Ontario & Riverside Ry. Co., Oswego, N. Y.  
 Linwood Street Ry. Co., Whitinsville, Mass.  
 Lorain & Cleveland Ry. Co., Cleveland, O.
- Maple Avenue Street Railway Co., Elmira, N. Y.  
 Meriden Electric R. R. Co., Meriden, Conn.  
 Meriden, Southington & Compounce Tramway Co., Meriden,  
 Conn.  
 Metropolitan Street Railway Co., New York City.  
 Miamisburg & Germantown Traction Co., Miamisburg, O.  
 Middlesex & Somerset Traction Co., New Brunswick, N. J.  
 Middletown-Goshen Traction Co., Middletown, N. Y.  
 Montoursville Passenger Railway Co., Montoursville, Pa.  
 Montoursville Railway Co., Montoursville, Pa.
- Newburgh Electric Ry. Co., Newburgh, N. Y.  
 New Jersey Electric Railway Co., Hoboken, N. J.  
 New Haven & Centerville St. Ry. Co., New Haven, Conn.  
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 Niagara, St. Catharines & Toronto Ry. Co., St. Catharines, Ont.  
 Norfolk Railway & Light Co., Norfolk, Va.  
 North Hudson County Ry. Co., Hoboken, N. J.  
 North Jersey St. Ry. Co., Jersey City, N. J.  
 Norwalk Tramway Co., South Norwalk, Conn.
- Ohio Central Traction Co., Galion, O.  
 Olympia Light & Power Co., Olympia, Wash.  
 Omaha Street Ry. Co., Omaha, Neb.  
 Omaha & Council Bluffs Ry. & Bridge Co., Council Bluffs, Ia.  
 Ottawa Street Ry. Co., Ottawa, Ont.
- Passaic & Newark Electric Traction Co., Passaic, N. J.  
 Paterson Railway Co., Paterson, N. J.  
 Peekskill Traction Co., Peekskill, N. Y.  
 Pennsylvania & Ohio Railway Co., Conneaut, O.  
 Pennsylvania & Ohio Traction Co., Ashtabula, O.  
 Perth Amboy Railroad Co., Perth Amboy, N. J.  
 Plainfield Street Railway Co., Plainfield, N. J.  
 Port Norfolk Electric Ry. Co., Portsmouth, Va.
- Raritan Traction Co., Perth Amboy, N. J.  
 Richmond & Petersburg Railway Co., Richmond, Va.  
 Richmond Traction Co., Richmond, Va.  
 Richmond Railway & Electric Co., Richmond, Va.  
 Rutland Street Ry. Co., Rutland, Vt.  
 Rochester & Sodus Bay Railway Co., Rochester, N. Y.  
 Rochester & Suburban Railway Co., Rochester, N. Y.
- Sandusky & Interurban Electric Ry. Co., Sandusky, O.  
 San Diego Electric Ry. Co., San Diego, Cal.  
 South Chicago City Ry. Co., South Chicago, Ill.  
 Southern Ohio Traction Co., Hamilton, O.  
 Springfield Electric Ry. Co., Springfield, Vt.  
 Staten Island Electric R. R. Co., New Brighton, N. Y.  
 Staten Island Midland R. R. Co., Stapleton, N. Y.  
 St. Louis & East St. Louis Electric Ry. Co., East St. Louis, Ill.  
 Suburban Traction Co., Orange, N. J.  
 Superior Rapid Transit Co., West Superior, Wis.  
 Syracuse, Lakeside & Baldwinsville Ry. Co., Syracuse, N. Y.  
 Syracuse Rapid Transit Ry. Co., Syracuse, N. Y.  
 Syracuse & East Side Ry. Co., Syracuse, N. Y.
- The Toledo & Maumee Valley Railway Co., Toledo, O.  
 Toledo, Fostoria & Findlay Ry. Co., Toledo, O.  
 Toledo & Western Railway Co., Toledo, O.  
 Toronto Suburban Railway, Toronto, Ont.  
 Tri-City Railway Co., Davenport, Ia.  
 Troy City Ry. Co., Troy, N. Y.
- Union Depot Railway Co., St. Louis, Mo.  
 Utica Belt Line Street R. R. Co., Utica, N. Y.  
 Utica & Mohawk Street Railway Co., Utica, N. Y.
- Van Brunt Street & Erie Basin Ry. Co., Brooklyn, N. Y.
- Wabash River Traction Co., Wabash, Ind.  
 Waterbury Traction Co., Waterbury, Conn.  
 Webster & Dudley Street Railway Co., Webster, Mass.  
 Westfield & Elizabeth St. Ry. Co., Plainfield, N. J.  
 West Side Street Railway Co., Elmira, N. Y.  
 Winchester Avenue St. Ry. Co., West Haven, Conn.
- Yonkers Street Railway Co., Yonkers, N. Y.
- Compania de Ferrocarriles del Distrito Federal, City of Mexico,  
 Mexico.  
 Compania de Transvias de Lerdo, a Torreon Gomez Palacio,  
 Durango, Mexico.  
 Compania de Tramvias Railway Co., Durango, Mexico.  
 Buenos-Aires & Belgrano Tramway Co., Buenos-Aires, Argentina.  
 Buenos-Aires Electric Tramway Co., Buenos-Aires, Argentina.  
 La Capital Tramway Co., Buenos-Aires, Argentina.  
 Costa Rica Electric Light & Transportation Co., San Jose, Costa  
 Rica.  
 Sao Paulo Railway Light & Power Co., Sao Paulo, Brazil.  
 Colombo Tramway Co., Colombo, Ceylon.  
 And all Electric Roads in Lisbon, Portugal.

“A New Broom Sweeps Clean.”

# THE CAMPBELL SNOW BROOM IS A NEW BROOM

The Campbell Broom will always be a new broom because it is so easy to repair

Patented  
February 14,  
1899



Other  
Patents  
Pending

Owned and Manufactured by The Consolidated Car Fender Co.

How a Street Railway Manager hates a snow storm—and can he be blamed? After months of careful, conscientious, hard work to make dividends possible, he sees the probability of a serious part of the accumulation about to be dissipated through lost daily earnings, expense of clearing streets, broken sweepers and generally unpleasant results; not to mention the complaints of a “kicking” public who have no appreciation of the difficulties surrounding the removal of this bane of the railroad man’s existence—“beautiful snow.”

In the work of clearing the snow from the streets the “sweeper” car plays a most important part.

In a heavy storm what is more discouraging for the manager than to hear that one by one the broom heads have broken and the sweepers are useless!

Too late then to wish that an order had been given for the Campbell Brooms!

Would it not be better to take this matter up at once and equip with this most workmanlike and effective invention?

The Campbell Snow Broom is made in half sections of any length, and can be applied or removed from the shaft in a few minutes—just the screwing or unscrewing of neatly fitted bolts and the deed is done.

Malleable iron adjustable heads make the Campbell Broom practically indestructible and good for years. The heads will not break, they cannot wear out.

The rattan being so small a part of the entire expense of the broom, a little work and small expenditure make a new broom.

Now for a recapitulation of the advantages of the Campbell Broom. Original cost but little more than the ordinary “home-made” broom whose short existence reminds one of the epitaph on the grave stone of the child who died at three days old,

“If I am so soon done for,  
I wonder what I was begun for.”

Practically indestructible; easily applied and removed—no difficulty about that; rattan easily renewed; and better yet the knowledge that whatever else the Manager has to worry about there is no trouble about the *sweeper car*, because if that is equipped with the Campbell Broom it is all ready to do *its* duty, and is not going to go to pieces at the moment when most needed.

Notice—in one heavy storm, the first where the Campbell Broom was used, at the end of forty-eight hours, twenty-eight sweepers equipped with the old style brooms were useless, and the sweeper equipped with the Campbell Broom came up on the morning of the third day “bright and smiling,” and as ready for work as when it began.

The question is not can you afford to put the Campbell Broom on, but can you afford to wait even a week before placing your order for a complete equipment with the Campbell Snow Broom, a “new broom”—always new—and, like the proverbial new broom “sweeps clean.” Fitted to all sweeper cars. Write us. Get in touch with this Campbell Broom, and be early prepared for the next snow.

OWNED AND MANUFACTURED BY

## THE CONSOLIDATED CAR FENDER CO.

FACTORY

PROVIDENCE, R. I.

OFFICE

39 & 41 CORTLANDT ST.,  
NEW YORK

# THE "MILLEN" CAR STEP LIFTER

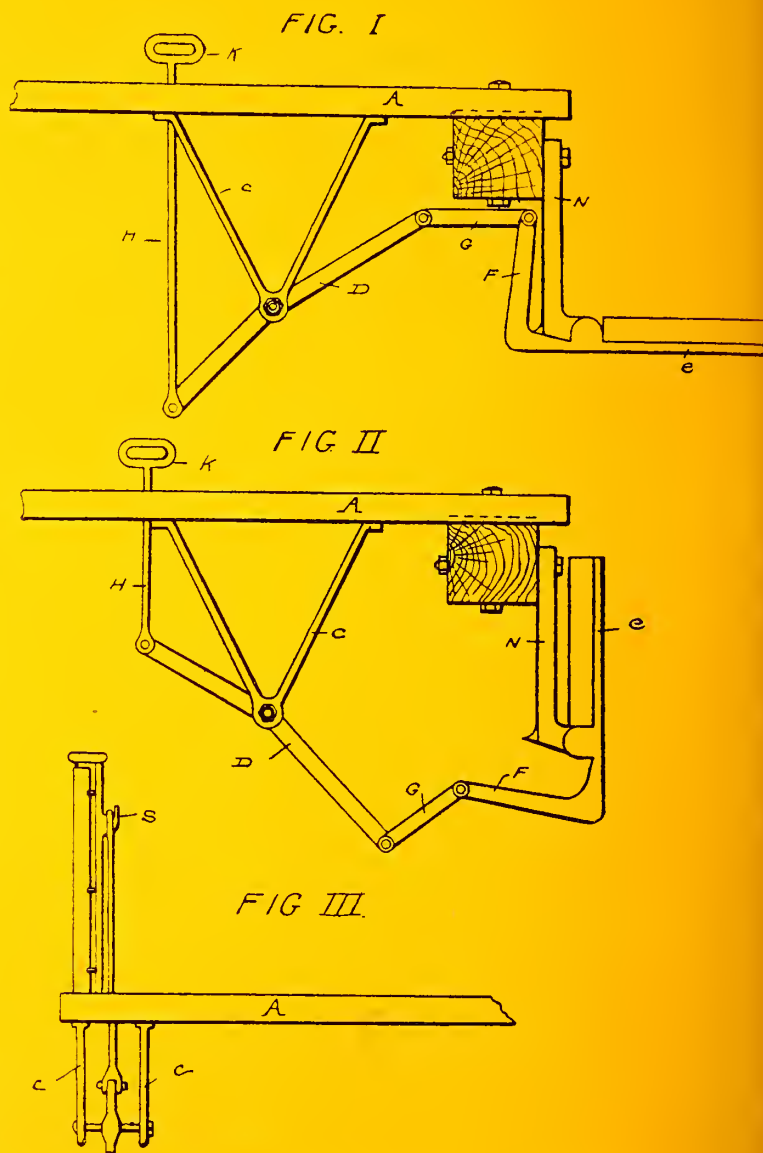
**THIS IS A LIFTING DEVICE,** attached to the under side of a car, and connected with both platforms of the same, so that the motorman or conductor, by lifting up a handle, can turn up the long step of an open car, and fasten it up, and also let it down again, without leaving the platform.

## IT HAS BEEN THE CUSTOM

heretofore to fold the steps up by hand, and fasten them with a hook or chain, it being necessary to have the step on the inside of the car, that is, the side which is next to opposite going car, folded up out of the way, so as to give more space between two passing cars, and also to prevent passengers from entering or leaving the car from the "off side." It is also quite necessary at times, when passing trucks or wagons in crowded streets, to lift up the outside steps until the vehicle or obstacle is passed, and then lower it down again. All of this may now be done without stopping the car or leaving the platform.

## WE HAVE ALREADY EQUIPPED

a large number of cars on the Metropolitan Road, in New York City, with this device, and they are giving perfect satisfaction.



For all information address

# THE CONSOLIDATED CAR FENDER CO.

39 & 41 CORTLANDT STREET,

FACTORY: PROVIDENCE, R. I.

NEW YORK

# WENDELL & MacDUFFIE

## 26 CORTLANDT STREET

Cable Address, Wenmac  
Lieber and Premier Codes

NEW YORK, U. S. A.

European Representative  
VICTOR DOURIN  
Paris and Brussels

SNOW  
PLOWS

SPRINK-  
LERS

TROLLEY  
POLES

WHEELS  
AND  
AXLES

CAST  
WELDED  
RAIL  
JOINTS

TROLLEY  
AND  
FEEDER  
WIRE

GEARS  
AND  
PINIONS

RAIL  
BONDS

LINE  
MATERIAL

TOWER  
WAGONS

POLES  
AND  
BRACKETS

STEAM  
RAILROAD  
SPECIAL-  
TIES



Electric Locomotives for all kinds of Transportation Service



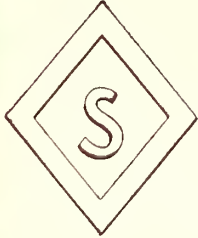
The Shop where our Gears and Pinions are made

### EVERYTHING FOR ELECTRIC RAILWAYS

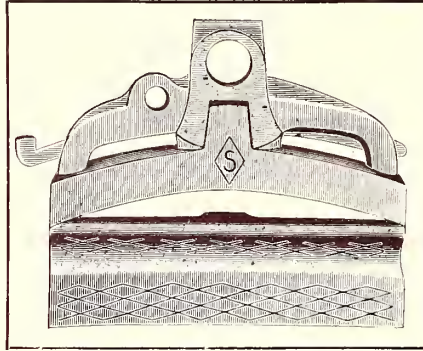
# THE AMERICAN BRAKE SHOE COMPANY

OWNER OF THE DIAMOND "S" AND SARGENT PATENTS

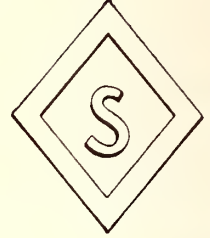
The Brake Shoes made under the A. B. S. Co.'s patents meet the Master Car Builders' Specifications and represent the highest development of Brake Shoe practice



Efficient  
Strong



Durable  
Economical



## THE DIAMOND "S" BRAKE SHOE

Manufactured and Sold by

THE SARGENT COMPANY  
Chicago, Ill.

RAMAPO FOUNDRY CO.  
Mahwah, N. J.

ROSS-MEEHAN FOUNDRY CO.  
Chattanooga, Tenn.

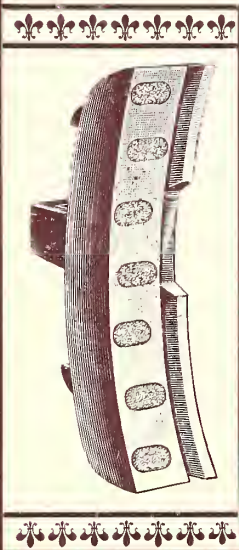
PARKER & TOPPING  
Brainerd, Minn.

EUREKA FOUNDRY CO.  
Cincinnati, O.

WESTERN ELECTRICAL SUPPLY CO.  
St. Louis, Mo.

PORTER & BERG  
Chicago, Ill.

# THE CRESCENT BRAKE SHOE



WILL RUN 250 PER CENT. MORE MILES THAN  
ANY OTHER BRAKE SHOE ON THE MARKET.  
WE WILL GUARANTEE THIS TO ANY ROAD

Does not jar the car in stopping!  
Does not grab the wheel!  
Does not lock the wheel!

Cannot get flat wheels using this shoe!  
Life of the gear and wheel lengthened!  
Less power needed than with other shoes!

TESTS AND REPORTS FURNISHED ON APPLICATION TO

## The Crescent Brake Shoe Co.

125 HUDSON STREET

PHILADELPHIA, PA.

# CAR SEATS

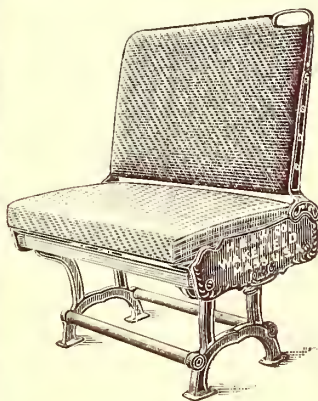
REVERSIBLE AND TURNOVER BACKS  
FOR STEAM AND ELECTRIC RAILROADS



Interior of Standard Car  
Albany & Hudson Railway & Power Co.



Interior of  
Brooklyn Elevated Railway Car.



No. 42

These two seats are the best traffic winners that you can put into your equipment.

Look at the cut of our No. 42 and of the interior of the Albany & Hudson Car and make a note of the finished appearance of the seats. There are no long, unsightly arms traveling by the ends. There is no seat made that gives more cushion space in proportion to the length over all, and our offset backs increase the aisle space to a maximum.

Our No. 97 Individual Revolving Seats are the most remarkable development that has been made during the last decade in the car seat line. They give every passenger a seat to himself without crowding. The people of Brooklyn, N. Y., where the first cars equipped with these seats were put into commission, call them "Parlor Cars," and they are the most popular cars in that city.

We also make Longitudinal Seating and Rattan Webbing for Upholstering Car Seats.



No. 97 B

**HEYWOOD BROS. & WAKEFIELD COMPANY**  
WAKEFIELD, MASS.



# THE HALE & KILBURN "WALKOVER" CAR SEATS ALWAYS IN ADVANCE

OUR SEATS in USE on  
the ELECTRIC LINES  
in the Following Cities  
of the UNITED STATES

- |               |                  |
|---------------|------------------|
| Philadelphia  | Cleveland        |
| New York      | Milwaukee        |
| Cincinnati    | Hartford         |
| Chicago       | St. Louis        |
| Detroit       | Kansas City      |
| Washington    | St. Paul         |
| Pittsburg     | Charleston, S.C. |
| Baltimore     | Saginaw          |
| Atlanta       | Providence       |
| New Orleans   | Omaha            |
| San Francisco | Denver           |
| Albany        | Norfolk, Va.     |
| Buffalo       | Binghamton       |
| New Haven     | Toledo           |
| Brooklyn      | Scranton         |
|               | Portland, Ore.   |

ADVANTAGES OVER ALL OTHERS

- Two inches more sitting space.
- Free Space for Luggage.
- Best Corner Grip Handle.
- Unequalled Spring Construction.

No. 80¾  
Made in Rattan,  
Plush, Carpet  
and Wood.



Photographs, Prices  
and all information on  
application.



Also  
Makers of  
The Best Longitudinal  
Spring Seating, either Spring edge or  
Non-Spring Edge, Covered in Rattan,  
Plush or Carpet.

Most durable in existence.

THE HALE & KILBURN MANUFACTURING CO.

PHILADELPHIA    NEW YORK    CHICAGO    RICHMOND

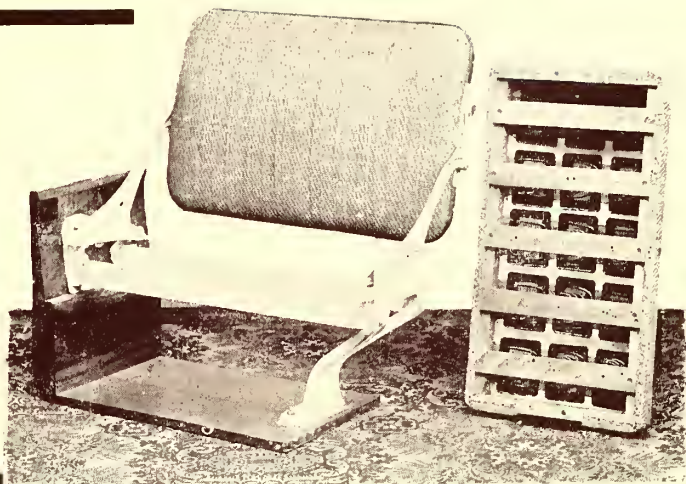
# ...SCARRITT... Street Car Seats

5 Points of Superiority: Comfort, Simplicity,  
Durability, Elegance and Economy

Reversible and Longitudinal Seating in Rattan, Leather or Wood

CORRESPONDENCE SOLICITED ESTIMATES FURNISHED

**Scarritt Furniture Co., ST. LOUIS**



**THE BEST RATTAN CAR SEATS** AT REASONABLE PRICES  
*American Car Seat Co.,* 13 GUERNSEY ST.,  
BROOKLYN, N. Y. MANUFACTURED BY THE

RATTAN CAR SEATING, CANVAS LINED MANUFACTURERS AND HEADQUARTERS  
*American Rattan & Reed Mfg. Co.,* 18 GUERNSEY ST.,  
BROOKLYN, N. Y.



Every Genuine Roller has the name of manufacturer,  
STEWART HARTSHORN, in script on label.

Special rollers for street and steam railway cars.  
Brackets suitable for all classes of fittings.  
Used all over the world wherever cars are run.

**STEWART HARTSHORN CO.**

NEW YORK, 486 Broadway, Office and Factory,  
CHICAGO 255-257 Wabash Ave. E. NEWARK, N. J.

## COTTON DUCK

and CURTAIN STRIPES

**JOHN BOYLE & CO.**

199-207 Fulton St., NEW YORK and 1016 Penn Ave., PITTSBURGH  
Samples and Prices on Application.



Send for  
Samples.

SILVER LAKE WATERPROOFED CORD  
FOR ARC LIGHT AND TROLLEY CORD.

**SILVER LAKE CO.,** Boston, Mass.

REG TRADE MARKS



THE PHOSPHOR BRONZE SMELTING CO. LIMITED,  
2200 WASHINGTON AVE., PHILADELPHIA.  
"ELEPHANT BRAND PHOSPHOR-BRONZE"  
INGOTS, CASTINGS, WIRE RODS, SHEETS, ETC.  
— DELTA METAL —  
CASTINGS, STAMPINGS AND FORGINGS.  
ORIGINAL AND SOLE MAKERS IN THE U.S.

## STUART-HOWLAND CO.

RAILWAY SUPPLIES  
283 & 285 Devonshire St.,  
Tel., Boston 4127 & 4144. BOSTON

# The Universal Car Step Lifter

Covered by U. S. Patent, No. 672,564

**A** PPLICABLE to open or closed cars having one, two or three folding steps, or both folding and fixed steps. Adds to the convenience of passengers and the ease of handling traffic. By folding both running boards, longer and wider cars may be used.

See Descriptive article in this issue

Patent rights for the equipment of cars with this step lifter in any of its forms may be acquired by addressing, **L. G. MONTONY,** 128 Twelfth Street ...TROY, N. Y.

## A List

OF THE RAILWAY  
APPARATUS AND SUPPLIES  
MANUFACTURED BY THE

## General Electric Company

WILL BE FOUND ON THE  
BACK COVER OF  
THIS ISSUE.

See also pages 115-118

BEFORE ORDERING REGISTERS IT WILL  
PAY YOU TO INVESTIGATE THE  
"SELF-RECORDING" TYPE OF THE

## St. Louis Register Co.

See Advertisement on page 4 of this issue

**GILES S. ALLISON**

Sole Sales Agent 57 Broadway, New York

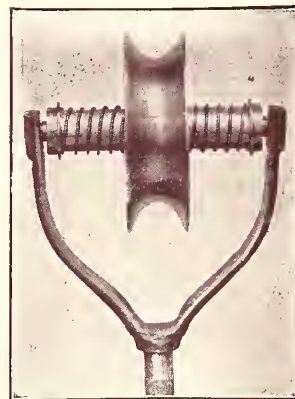
## Some Leading European Manufacturers of Car Fittings and Appliances:

Allgemeine Elektrizitäts-Gesellschaft, Berlin, Germany.  
Blackwell & Co., Robert W., Ltd., London.  
British Electric Car Co., Ltd., London.  
British Schuckert Electric Co., Ltd., London.  
British Thomson-Houston Co., Ltd., London.  
British Westinghouse Electric & Mfg. Co., Ltd., London.  
Brush Electrical Engineering Co., Ltd., London.  
Crompton & Co., Ltd., London.  
Dick, Kerr & Co., Ltd., London.  
Diener & Co., Alf., Zurich, Switzerland.  
Electric Railway and Tramway Carriage Works, Ltd., Preston, Eng.  
Estler Bros., London.  
European McGuire Mfg. Co., London.  
General Electric Co., Ltd., London.  
Imperial Electric Supplies, Ltd., London.  
International Electrical Engineering Co., London.  
Johnson-Lundell Electric Traction Co., Ltd., London.  
Lahmeyer Electrical Co., Ltd., London.  
Maguire & Baucus, London.  
Miller & Co., Ltd., Edinburgh, Scotland.  
Milnes & Co., George F., Hadley and Birkenhead, England.  
Siemens Bros. & Co., Ltd., London.  
Société Industrielle d'Electricité Procédés Westinghouse, Paris, France.  
Suter & Co., Ltd., Frank, London.  
Union Elektrizitäts-Gesellschaft, Berlin, Germany.  
Western Electric Co., London.  
Westinghouse Brake Co., Ltd., London.  
Witting Bros., Electrical Engineers and Contractors, Ltd., London.

For European Advertisements see pages 34-102 of this issue

## "ECONOMY"

"Self-lubricating Trolley  
Harp and Wheel"



### DECREASED FRICTION

on account of ball  
bearings

### LARGE WHEEL

and consequent

Longer Life

Lateral movement of  
wheel saves wheel and  
wire on rounding curves

and

### PREVENTS JUMPING OFF.

MANUFACTURED BY

**Edison-Johnson Electrical Mfg. Co.**

58 Greene Street, New York City

# The "New Haven" Fare Registers



ROUND SINGLE

ALL  
STYLES



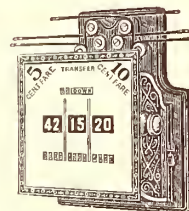
SQUARE SINGLE

SQUARE  
AND  
ROUND



SQUARE DOUBLE

SINGLE  
DOUBLE  
TRIPLE



SQUARE TRIPLE

ROUND DOUBLE REGISTER



YOU certainly want the best.

WE simply state

THAT THE "NEW HAVEN" FARE REGISTERS possess all the valuable features of ALL other makes, and besides others of their own.

THAT they are constructed on principles which years of experience and experiment have demonstrated to be absolutely correct, and we suggest

THAT YOU test a sample for YOURSELF, to be returned if not satisfactory.

....FULLY GUARANTEED....

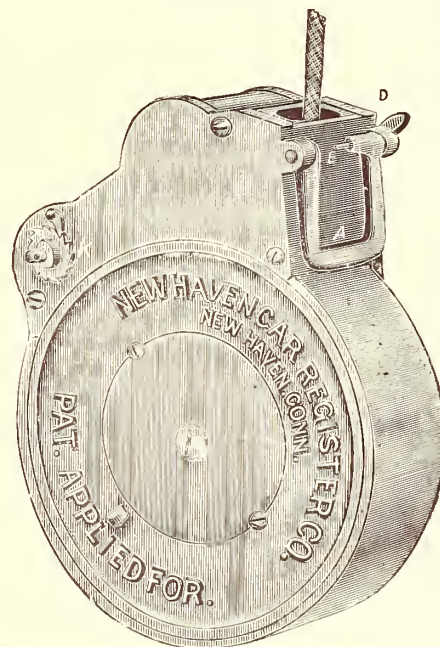
They say==

## The "New Haven" Trolley Pole Catcher

is the best yet

WE THINK YOU'LL THINK so too after a trial. If you don't, why just send the sample back.

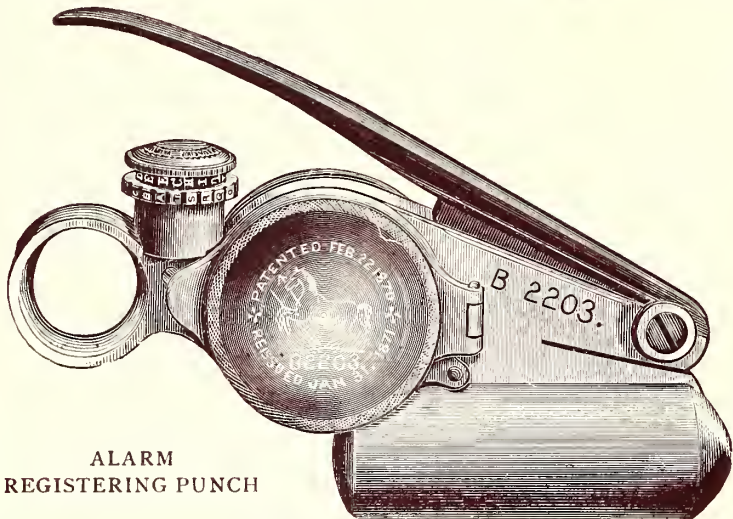
REMEMBER==Our guarantee with each one.



**THE NEW HAVEN CAR REGISTER CO.** New Haven, Conn.

Full Exhibit at Convention Space at Main Entrance

# ALARM REGISTERING PUNCH



ALARM REGISTERING PUNCH

Clippings should agree. This system has been found very perfect by the roads using it, being some of the largest in this and foreign countries.

**T**HIS Register we claim to be the most perfect check yet devised for the collection and registration of fares on Street Railroads, especially where different rates of fares and tickets are to be collected.

The conductor is provided with Trip Slips of different colors for different rates of fare, on which he is obliged to punch out a number every time he receives a fare; there is a register in the Punch which records the number of times it is operated; the register and the receptacle for clippings are secured by a combination lock, which renders access to them impossible by any one unacquainted with the combination.

When the conductor renders his report to the office he returns his Trip Slips, Tickets and Punch; and the Register Totals, Slips, and

## RAILWAY REGISTER MANUFACTURING CO.

For further particulars, prices, etc., address all communications to  
EDWARD BEADLE, MANAGER, 1193 BROADWAY, NEW YORK, U. S. A.

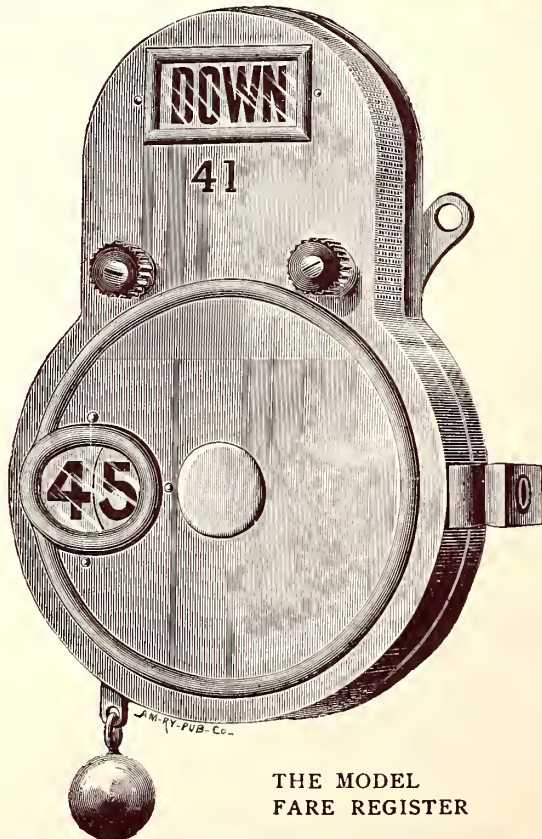
# MODEL REGISTER

**T**HIS portable Register is the best of its class yet introduced. Each time it is operated, the bell rings, the fare is recorded, and a corresponding figure is shown through the opening in front of the register in view of the passenger. It also has an indication plate showing the direction the car is going, and which the conductor is compelled to change at the end of the route.

It is also provided with a punch at side to cancel passes, tickets, transfers, etc., making, in all, a very perfect and handsome machine.

It has many advantages over the clock or stationery register, as conductors can collect their fares much more rapidly by thus doing away with reaching over the passengers' heads to operate the register rope or rod attachment. It also avoids the necessity of having some one to take off the state of the register each time a conductor changes his car, as with The Model he uses the same register during the entire day, and is solely responsible for it.

We can highly recommend this register to roads having one rate of Cash fare, Tickets, Transfers, etc.



THE MODEL FARE REGISTER

SPECIAL ATTENTION PAID TO EXPORT ORDERS



## YOU CAN'T BEAT IT.

Our registers are made in such a way that it is impossible to open them and set them back without detection.

This is because of the signature seal.

The case is locked to the bed plate by a spring lock. Over this lock is placed a signature seal.

The only way to open the register then is to break the glass. This destroys the slip of paper on which the signature is written.

The only way to put things back again is to counterfeit the signature and duplicate the paper, which is utterly impossible under the circumstances under which it must be done.

More than that, even if the machine were all taken apart, no one can set the totalizer back.

The International Totalizer is the only one that cannot be set back in any way.

Your permanent record is protected for all time.

The International Register may not be absolute perfection, but it is nearer perfection than any other register.

It will save you money and worry on your line.

The biggest and best street railways in the country are using it.

### THE INTERNATIONAL REGISTER COMPANY,

118-132 W. Jackson Boulevard, Chicago, Ill.

#### SALES AGENTS.....

FRANK RIDLON COMPANY, 200 Summer St., Boston, Mass.

THE MAYER & ENGLUND COMPANY, 10 South Tenth St., Philadelphia, Pa.

JOSHUA HENDY MACHINE WORKS, 38 Fremont St., San Francisco, Cal.

# Fowler & Robert Mfg. Co.

JOHN W. FOWLER, President  
Formerly of the Lewis & Fowler Mfg Co.

BROOKLYN, N. Y.

GEO. W. LINCH, Treasurer  
FRED. VIEWEG, Secretary

New York Office, 149 Broadway.

Works, 1263 Atlantic Ave., Brooklyn.

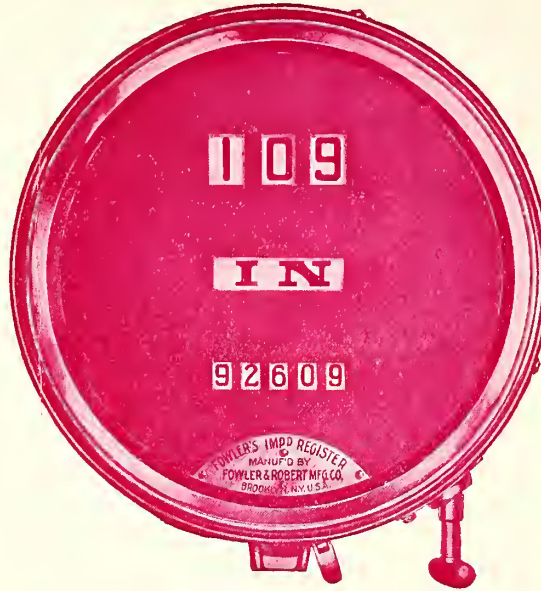
ACCURACY



THE L. & F. IMPROVED

Originally introduced by Lewis & Fowler in 1877

DURABILITY



NO GLASS  
ON THIS REGISTER

## FARE REGISTERS

Our Specialty

WE MAKE FARE REGISTERS  
REPAIR " "  
EXCHANGE " "  
(all makes)

### 4 DIFFERENT MODELS

EACH ONE ADAPTED TO MEET DIFFERENT REQUIREMENTS, CONTAINS LATEST IMPROVEMENTS.

Would you like to see our representative? He will explain the difference and quote you prices.

It Registers,  
 Indicates and  
 Computes  
 Separately  
 Fares of All Kinds



**I**T tabulates and keeps all records more accurately than a book-keeper on each car could do. Its operation is rapid and accurate.

It gives the company a printed report for each day's business.

It saves to the company the large expenditure for conductors' supplies, and 50 per cent. of detail work in the office. Its operation is fair, but exacting, to the conductor and cashier.

It provides a system whereby the collection of fares, and accounting for same, must be done in a business way. All managers want it done that way. Some have carefully investigated and are doing it that way. Others will investigate and do it our way.

We exhibit in October at the AMERICAN STREET RAILWAY CONVENTION IN NEW YORK. Please see us there.

**THE OHMER CAR REGISTER CO.**  
 DAYTON, OHIO.



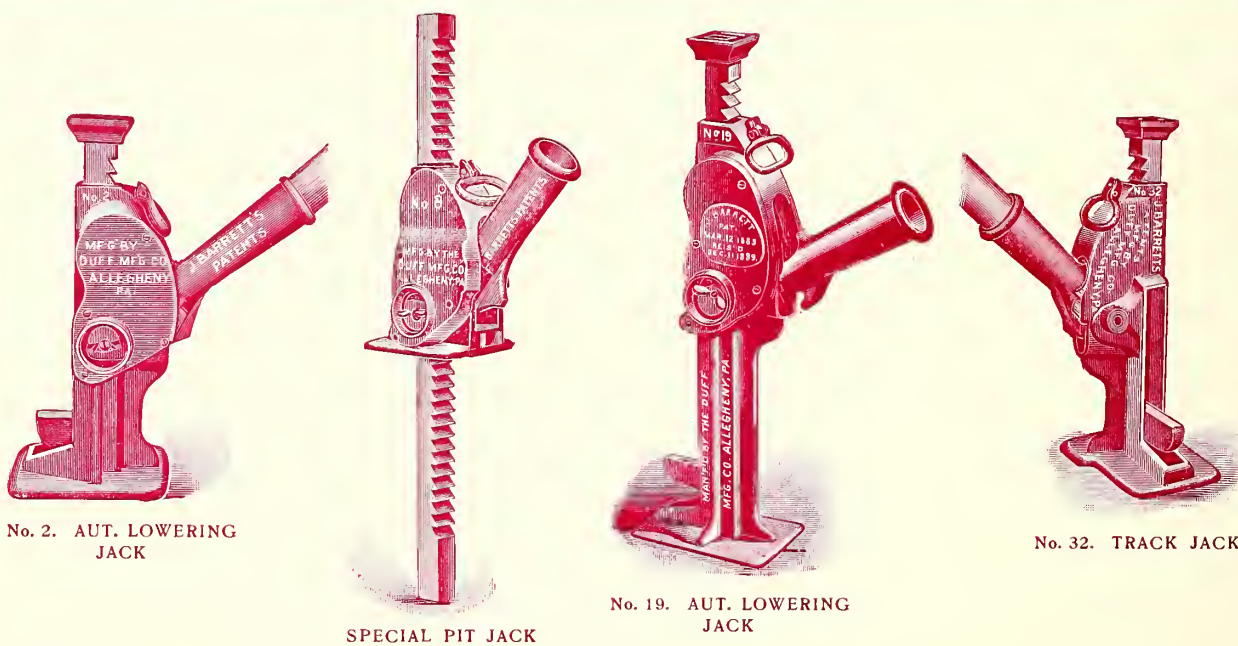
# STREET RAILWAY MANAGERS

AND THEIR PRACTICAL ASSISTANTS ARE FAMILIAR WITH THE

# Barrett Automatic Lever Jack

AS IT IS A  
RECOGNIZED  
STANDARD

Over 125,000 Barrett Jacks have been placed with American Railroad and Street Railway Companies



No. 2. AUT. LOWERING JACK

SPECIAL PIT JACK

No. 19. AUT. LOWERING JACK

No. 32. TRACK JACK

WE MAKE FIFTEEN DIFFERENT MODIFICATIONS SUITABLE TO EVERY PURPOSE FOR WHICH A JACK IS REQUIRED

... The BARRETT JACK is manufactured only by ...

# The Duff Manufacturing Co.

OFFICE, WESTINGHOUSE BLDG.  
PITTSBURG, PA.



WORKS  
ALLEGHENY, PA.

# NINE YEARS OF ACTUAL SERVICE

HAVE PROVED THAT THE DeWITT SAND BOX HAS NO EQUAL

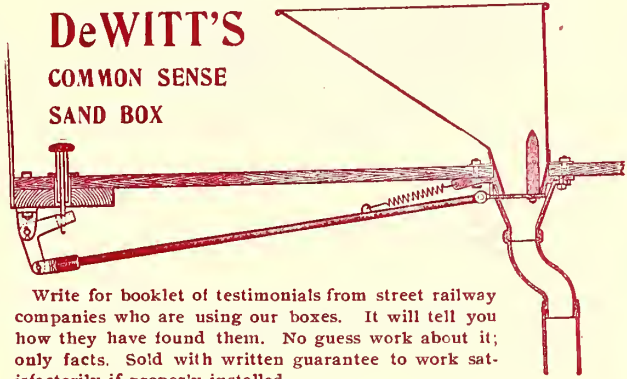
SIMPLICITY of CONSTRUCTION, RELIABILITY and DURABILITY are the essential requirements of a *good* Sand Box. The *best* is the one which possesses these features in the highest degree. In the DeWITT SAND BOX they are combined to an extent not approached by any other on the market

There are no complicated parts to get out of order. The best materials are used and the box will last as long as the car body.

We have never received a single complaint from any of the 500 roads on which the DeWITT SAND BOX is in daily use.

No matter how hard the sand may be caked in the hopper of box, by pushing the plunger or pulling the lever a few times the knives will loosen it so as to flow freely. There is no possibility of locking open the valve and losing the sand, as small stones in the sand cannot interfere with the valve slides.

## DeWITT'S COMMON SENSE SAND BOX

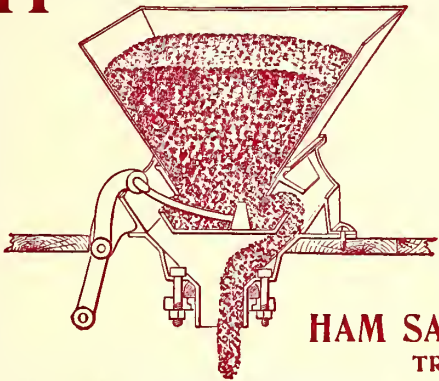


Write for booklet of testimonials from street railway companies who are using our boxes. It will tell you how they have found them. No guess work about it; only facts. Sold with written guarantee to work satisfactorily if properly installed

— Will gladly send a pair on trial —

DeWITT SAND BOX CO., 906 Third Ave., TROY, N. Y.

## HAM'S SAND BOX.



NO VALVE  
FEW PARTS  
CHEAPEST TO APPLY  
PRICE LOW

Endorsed by Leading  
Roads in America  
and Europe

Sample Pair sent for  
trial to any road.

CANNOT RUST, LEAK,  
WASTE SAND, DRAW  
MOISTURE

HAM SAND BOX CO.,  
TROY, N. Y.

Eastern Agent, FRANCIS GRANGER, 26 Cortlandt St., New York.  
Chicago Agents, PORTER & BERG, 309 Dearborn St.

## FLAT WHEELS NO LONGER A TROUBLE AND EXPENSE

This evil thoroughly and scientifically eradicated by use of  
THE WHEEL TRUING BRAKE SHOE



Trues your wheels for less than one dollar a pair and without  
taking the car out of service. In use all over the world.

WHEEL TRUING BRAKE SHOE CO. - - DETROIT, MICH.

## GEORGE KISSAM & CO.,

Largest Street Car Advertising Concern in the World.

We are prepared to negotiate for Long Time Leases with First Class Roads in any part of the United States.

BRANCH OFFICES IN LEADING CITIES.

GENERAL OFFICES, 253 BROADWAY, NEW YORK.

## THE AMERICAN BRAKE SHOE CO., Old Colony Building, CHICAGO,

Owner of Numerous Patents covering Tire Dressing, Extra Durable, Extra Strong and High Friction

### BRAKE SHOES FOR STEAM AND ELECTRIC RAILWAYS.

THE SARGENT COMPANY,  
CHICAGO.

PARKER & TOPPING,  
ST. PAUL, MINN.

WESTERN ELECTRICAL SUPPLY CO.,  
ST. LOUIS.

MANUFACTURED AND SOLD BY

RAMAPO FOUNDRY CO.,  
MANWAH, N. J.

AMERICAN STEEL CASTING CO.,  
THURLOW, PA.

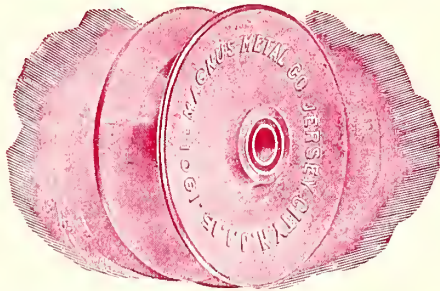
ROSS-MEEHAN FOUNDRY CO.,  
CHATTANOOGA, TENN.

EUREKA FOUNDRY CO.,  
CINCINNATI, O.

PORTER & BERG,  
CHICAGO.

# MAGNUS

TROLLEY WHEELS



GIVE GREATEST MILEAGE.  
MOST EASILY CARED FOR.  
MOST ECONOMICAL.  
HIGHEST CONDUCTIVITY.

They are Standard on the Brooklyn Heights Railroad, and many other Street Railways.



**MAGNUS METAL ...** is acknowledged by mechanical men generally throughout the country to be the best wearing metal obtainable; and you can not make any mistake in buying **MAGNUS Trolley Wheels. ...** Send us a Trial Order and be convinced.

## Magnus Metal Co.

364 NINTH STREET  
JERSEY CITY, N. J.



830 ELLICOTT SQUARE  
BUFFALO, N. Y.

# Reading Car Wheel Co.

READING, PA.

Makers of  
Car Wheels for  
Street Railway  
Service

Our methods of manufacture have been developed on scientific lines; and our wheel designs are of the most approved patterns. :: :: :: :: ::

We are prepared to furnish wheels fitted to axles as well as loose. :: :: :: :: ::

**W**E are newcomers in the Street Railway field, but we are not novices in the manufacture of car wheels, having to our credit many years of success in the production of cast iron car wheels for steam railroad service.

WE SOLICIT YOUR ENQUIRIES

H. H. HEWITT, President  
BUFFALO, N. Y.

S. G. BAKER, Gen. Sales Agent  
READING, PA.

## GRIFFIN WHEEL COMPANY

WORKS:

CHICAGO    DETROIT    DENVER  
ST. PAUL    TACOMA    KANSAS CITY

**CAR WHEELS** of every Description

## THE... Baltimore Car Wheel Co.

BALTIMORE, MD., U. S. A.

**C**HILLED WHEELS of all patterns and sizes, for every service, with or without axles.

See Advertisement in Section VIII.

## Electric Railway Department

of  
The Standard  
Car Wheel Company

Cleveland, Ohio.

### ESSENTIAL POINTS



STRENGTH AND DEEP CHILL

Manufacturers of  
ALL STYLES AND SIZES OF

## CHILLED WHEELS

For City and Suburban Lines

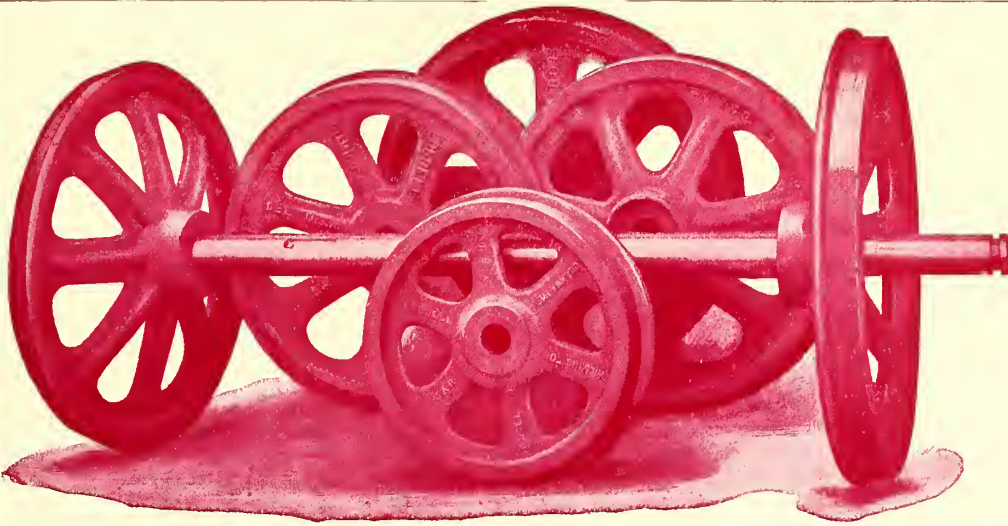
Axles Furnished  
and Wheels Fitted

WRITE FOR PRICES.

# LOBDELL CAR WHEEL COMPANY,

WILMINGTON, DEL., U. S. A.

The Largest and Oldest Car Wheel Establishment in the Country.



Capacity 800 Wheels Per Day.

MANUFACTURERS OF

## CAR WHEELS

OF ALL SIZES AND DESCRIPTIONS FOR

ELECTRIC AND CABLE CARS, SNOW PLOWS, SPRINKLERS, HORSE CARS, Etc.  
GROUND PERFECTLY TRUE ON TREADS.

## LEHIGH CAR, WHEEL & AXLE WORKS

Successors to McKEE, FULLER & CO.

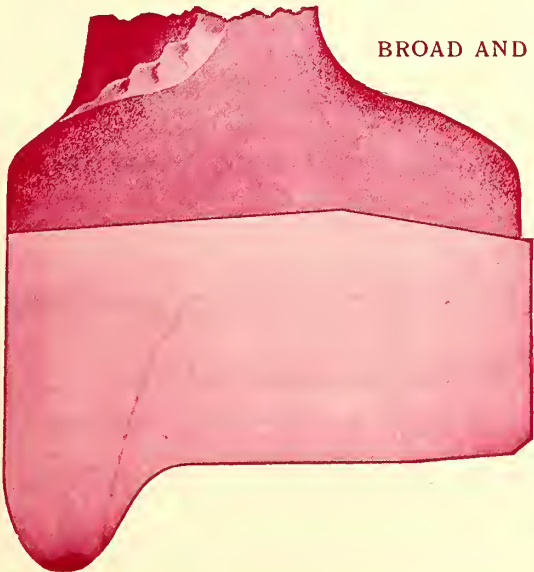
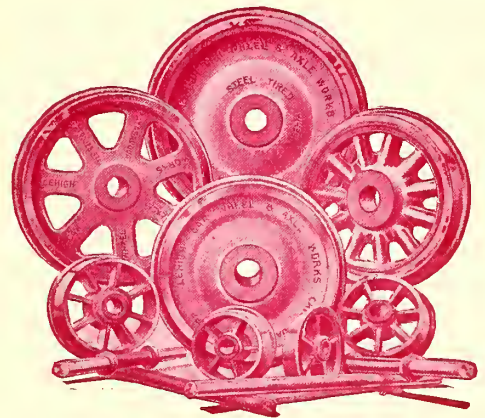
POST OFFICE ADDRESS

CATASAUQUA, PA., U. S. A.

Works at Fullerton, Pa.  
L. V. R. R.

Cable Code  
"Carwheel, Catasauqua"

BROAD AND NARROW GAUGE



## Freight and Coal Cars

OF EVERY DESCRIPTION

CHILLED AND STEEL TIERED

## CAR WHEELS

For Electric Railway and Steam Railroad Service

## Hammered Axles

AND OTHER FORGINGS

Capacity...  
20 Cars Per Day  
300 Wheels Per Day

Wheels fitted to Axles  
and prices furnished on  
application . . . .

# ...New York Car Wheel Works...

General Office and Works  
...BUFFALO, N. Y.

New York Office and Works  
...Corner Greenwich and Bank Sts.



...Makers of \_\_\_\_\_

## HIGH GRADE WHEELS...

FOR

Electric and Cable  
Tramway

... AND ...

Steam Railway  
Service...

SPECIAL QUALITY COLD ROLLED  
...AXLES \_\_\_\_\_

Of the Highest Quality and Finish...

Wheels Finished and Fitted to Axles in a Perfect Mechanical Manner.  
Largest and most Complete Equipment and Plant for the Manufacture  
of all Sizes and Kinds of Wheels for Electric Service...

# Improved Car Wheels

FOR CITY AND INTERURBAN SERVICE



Stronger Spokes  
Stronger Flange  
Deep, Even Chill  
Greater Mileage  
Absolute Safety

Are Important Advantages  
of our

## Re-Enforced Spoke Wheel

The only  
Spoke Wheel  
adapted for  
heavy, high-  
speed service.

THIS Wheel is being substituted in place of the old style Plate Wheel because it does NOT rumble and roar when on paved city streets.

A SAMPLE Order will prove its superiority over the old style Spoke Wheel.

WRITE FOR BOOKLET ON WHEELS

# St. Louis Car Wheel Co.

ST. LOUIS, MO.

# A. FRENCH SPRING CO.



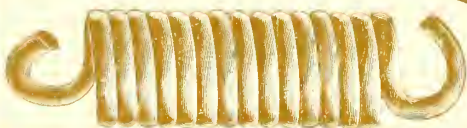
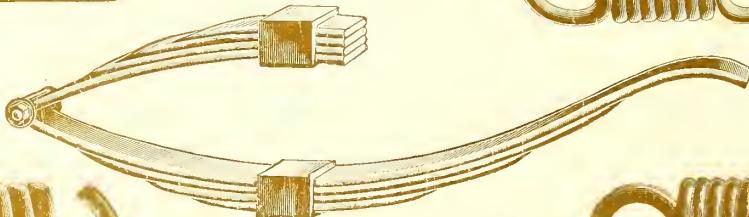
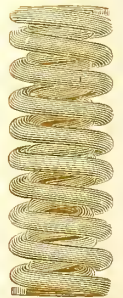
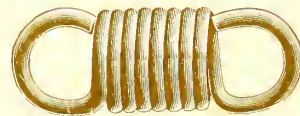
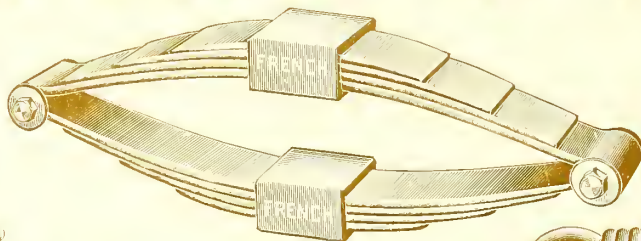
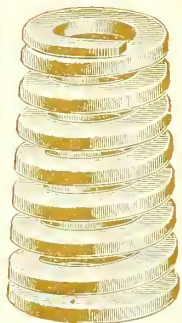
MANUFACTURERS OF

## CRUCIBLE CAST STEEL ELLIPTIC AND SPIRAL

# SPRINGS

OF SUPERIOR QUALITY  
FOR

## ELECTRIC CARS



THREE-QUARTER ELLIPTIC



Office and Works, PITTSBURGH, PA., 21st & Liberty Sts.

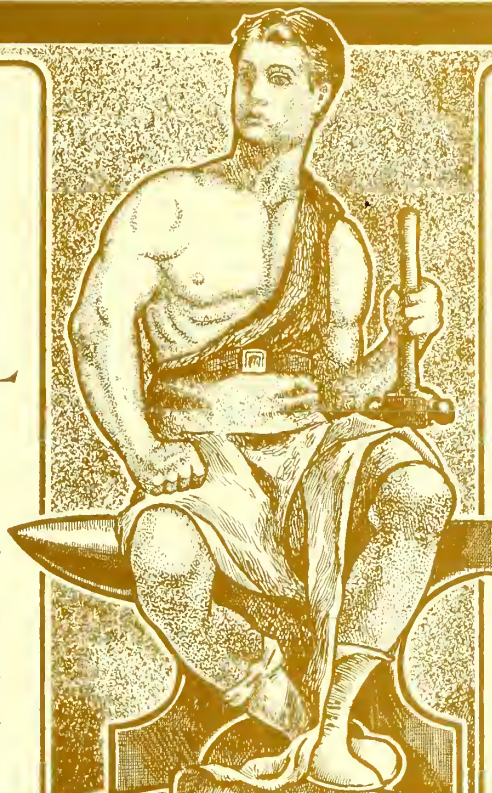
AGENCIES:

NEW YORK, 1608 Empire Building.

CHICAGO, 1414 Fisher Building.

**QUALITY,  
STRENGTH  
AND  
MECHANICAL  
SKILL**

Have always been strong features in the manufacture of our SPRINGS, and the prime factors in placing them high in the estimation of all users.



PRICES,  
TESTS, DRAWINGS,  
ORDER BLANKS  
AND  
FULL INFORMATION  
WILL BE  
GLADLY FURNISHED  
UPON  
APPLICATION.

Send for Copy of Our  
New Illustrated  
Catalogue.

C.S.S.Co

**RAILWAY**



**CHARLES SCOTT SPRING CO.**

CHARLES SCOTT,  
PRESIDENT.

**PHILADELPHIA, PA.**

CHARLES SCOTT JR.  
MANAGER.

FISHER BLDG.  
CHICAGO.

UNION TRUST BLDG.  
ST. LOUIS.

CUYAHOGA BLDG.  
CLEVELAND.



Elliptic  and Coil

TRADE MARK

# SPRINGS

OF SUPERIOR QUALITY

FOR ANY STYLE OF TRUCKS

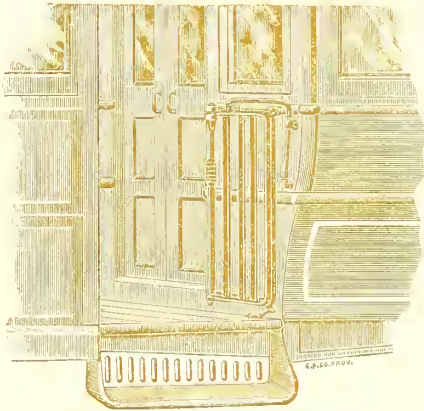
## Detroit Steel & Spring Co.

Detroit,



TRADE MARK

Mich.



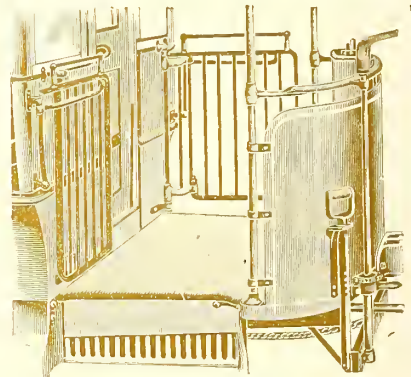
Folding Gate for Double Door Cars

### SPECIFY Wood's Gates

FOR ALL NEW CARS AND  
PROTECT YOUR PATRONS  
BY EQUIPPING YOUR OLD  
CARS . . . . .

12,500 CARS EQUIPPED  
SEND FOR PRICES

The R. Bliss M'f'g Co.  
PAWTUCKET, RHODE ISLAND



Standard Gate for Single Door Cars



ENGLISH AGENTS

R. W. BLACKWELL & CO., Limited  
LONDON, ENGLAND

### THE HIPWOOD-BARRETT Car and Vehicle Fender Co....

26 CORTLANDT STREET  
Factory, Lakeport, N. H.

...EXHIBIT IN ANNEX AT CONVENTION...

# THE TWENTIETH CENTURY LIFE GUARD

## Fourteen Points of Advantage.



CAR-FENDER IN OPERATIVE POSITION.

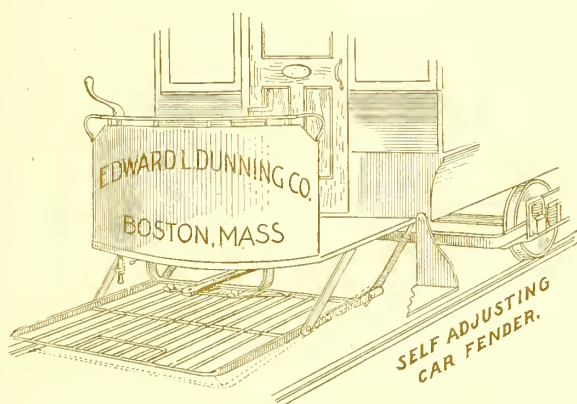
1. THE TWENTIETH CENTURY LIFE GUARD can be run at any desired height from track.
2. It can be dropped to track instantly and is locked to prevent rising over a fallen obstacle, an entirely new feature in fenders.
3. It can be raised back to any desired height while car is running full speed. It is also conveniently folded.
4. Can be worked from platform or centre of a cable car by simply lengthening press rods, another new feature in this Fender.
5. It is detached from car in the simplest manner possible.
6. Is interchangeable to any car, as all Fenders are constructed on a standard size.
7. The foot lever is worked by motorman's foot in a convenient position.
8. The Twentieth Century Lifeguard does not need adjusting when placed on car, that being done by foot lever, so no time is lost at end of trips.
9. It protects the dash in a most flexible manner and frame is cushioned throughout.
10. It is of simple construction and all parts are interchangeable.
11. When striking a heavy obstacle the slide frame is pressed into main frame giving greater strength.
12. The steel strips are unbreakable, they being very thin and pliable.
13. The Fender can be knocked out of square six (6) inches without injury.
14. The Fender is inexpensive and is easy to repair by simply drawing hinge rod out; the two parts of Fender are divided.

W. T. WATSON, Patentee,

P. O. Box 769,

NEW YORK.

SHOWING THE FENDER  
HOUSED WHEN NOT  
IN USE.



The above cut represents our

### SELF-ADJUSTING CAR FENDER

This fender is light, durable, neat, cheap and a life saver; it is the lightest fender now on the market (weight complete, per pair, 100 lbs.), made throughout of the best wrought iron, never breaks—only bends, most convenient for handling; stows closely under platform. All the good features with none of the bad. It is now in use on several of our leading roads. Full size model may be seen at our office. Price per set, \$25.00.

**EDWARD L. DUNNING CO.** Sole Manufacturers  
and Agents ...

64 FEDERAL ST., BOSTON, MASS.

## THE Duner Folding Door

FOR STREET, INTERURBAN  
AND ELEVATED CARS

### 4 Strong Points in its Favor

- 1st. It requires the least space.
- 2nd. Quick action.
- 3rd. Does not get out of repair easily.
- 4th. Door can be opened readily when the platform is crowded.

Duner's Folding Door is now used on the Northwestern and the Lake Street Elevated roads and the Calumet Electric Street R. R. of Chicago. Refer, by permission, to Gen. Supt. F. Hedley, Merchants Loan & Trust Building, Chicago.

For further information address:

**J. C. DUNER**

360 Watt Avenue - PULLMAN, ILL.





"Compo"  
TRADE MARK

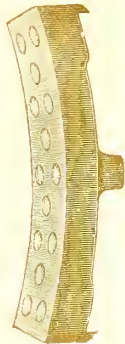
# "COMPO" SPECIALTIES

With CORK INSERTS  
PATENTED

## For Automobiles with Band Brake

Brakes without gripping. Brake shoes are made expressly for rubber tires. Cork being resilient, does not gather up the grit or score the tire.

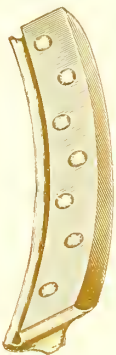
Christy Brake Shoe



"Compo"  
TRADE MARK

## FOR LOCOMOTIVE TRUCK AND CAR SERVICE

Electric Railway Shoe



"Compo"  
TRADE MARK

## Specially adapted to the ELECTRIC STREET RAILWAY SERVICE

where frequent and effective stops are required. Largely in use in New England. Shows highest co-efficient of friction in Master Car Builders Association tests.

The elasticity of the cork overcomes gripping and skidding the wheels and gives smoother running of the cars.



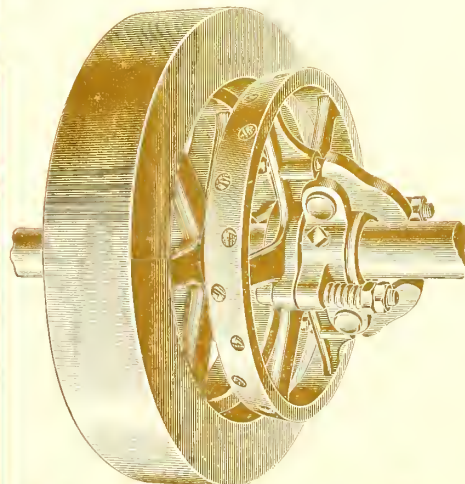
11 x 11 inch Dynamo Pulley

## PREVENTS SLIPPING OF BELTS GIVES INCREASED POWER

Iron pulleys in all sizes. Corks inserted in wood and paper pulleys.

An official comparative test at Polytechnic Institute, Worcester, Mass., on an Alden Absorption Dynamometer shows average slip of belt over fifty per cent. less on "Compo" pulley than a plain iron wire pulley.

## MACHINERY CLUTCHES



Insures smooth running, and overcomes all gripping and strain on machinery. We use cork in its natural elastic state and not compressed ground cork in blocks.

**Allston Foundry Co.,** 620 Atlantic Ave., BOSTON, MASS.

WILLIAM W. WHITCOMB, President

## YOU NEED THE Universal Safety Tread

On Your Car Steps, Platforms and Floors.



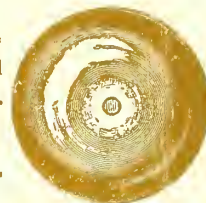
Clean, Safe, Durable. Outwears all other forms of Tread.

Samples and Price List Furnished.

**Universal Safety Tread Co.,** 45 BROADWAY, NEW YORK, N. Y.

## SEAMLESS STRUCTURAL CO., Manufacturers of Rolled Steel Gongs.

Foot Gongs and Attachments for Street Cars.

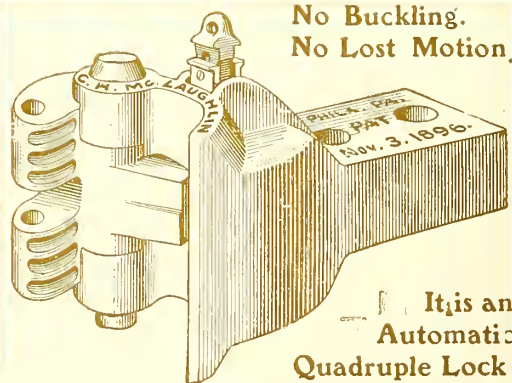


The Most Durable Gong Made.

P. O. Box 246.

WORKS, 718 to 732 HANOVER ST., MILWAUKEE, WIS.

## The McLAUGHLIN SAFETY CAR COUPLER



No Buckling.  
No Lost Motion.

It is an Automatic Quadruple Lock

Is quicker of movement, in case of fire, than any other type used for Street Railways. It is an automatic quadruple lock; it has lock for lock. It covers all the requirements of the law. It is the style of coupler adopted by the Master Car Builders Association of the United States.

Write for prices.

**McLAUGHLIN CAR COUPLER CO.,** Hutchinson St. and Columbia Ave., Philadelphia, Pa.

# ...MERIT WINS...

**A**FTER a rigid investigation of the workings and merits of the Van Dorn Automatic Couplings, the Manhattan Railway Co. of New York has placed an order with us direct for 1,000 CAR EQUIPMENTS, and has also specified the Van Dorn Couplers with draft rigging for 100 new cars ordered of car builders. All the new Boston Elevated Cars have also been equipped by us. They

have been in use eight years on street and interurban roads, and we have over 50,000 in operation on this class of service. They have also been in use on the elevated roads of Chicago for seven years. These facts demonstrate

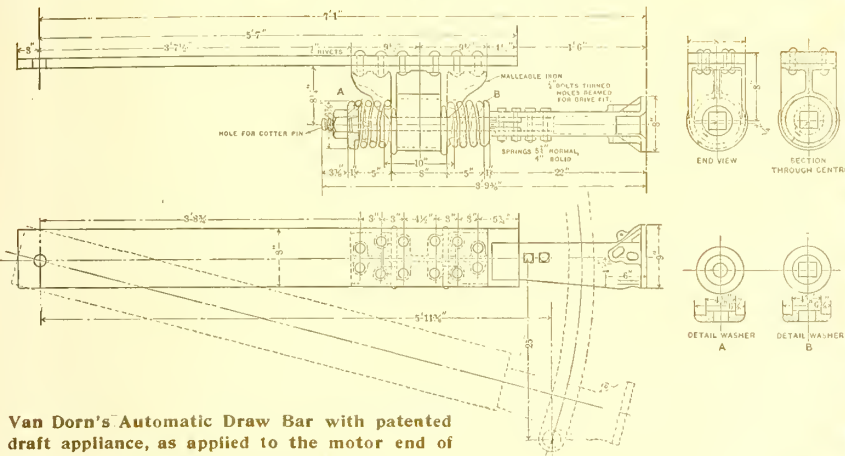
*The Great  
Superiority*

*of the*

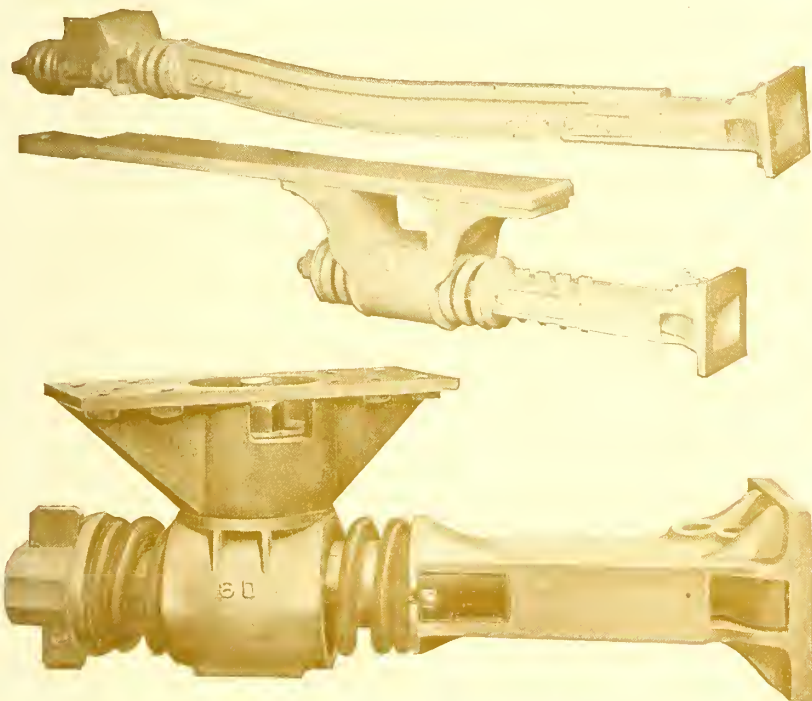
**Van Dorn  
Couplers**



We have now sixteen sizes of couplers, adapted to all conditions of traffic. Everything about the Van Dorn Couplers is fixed facts—no gravity, and the tightest coupling ever effected. Another thing that makes our couplers a favorite the whole country over is the complete draft rigging furnished in connection with the couplings. We build what is called the D. L. Barnes patent swivel on the body bolster in connection with our automatic head, which assures smooth running trains without a particle of jerking motion. We also build the Van Dorn patent draft rigging for motor cars, especially designed by us to clear motors and yet give direct pull. Be sure to specify Van Dorn equipment on your new rolling stock, and take no other. For further information, apply to



Van Dorn's Automatic Draw Bar with patented draft appliance, as applied to the motor end of motor car of the Manhattan Railway Co.



STANDARD TYPES OF VAN DORN COUPLERS.

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**W. T. VAN DORN CO.**  
Monadnock Block **CHICAGO, ILL.**

W. T. VAN DORN, General Manager

THE  
MAYER & ENGLUND CO.

10, South 10th Street, Philadelphia

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We carry *the* largest stock of exclusively high-grade electric railway material in *the* United States. *✽* Our line covers all supplies necessary for *the* line, power house, and rolling stock.

LEADING manufacturers throughout the Country recognize us as possessing the most complete facilities for handling strictly high-grade material for the construction, operation and maintenance of electric railways, and as a result we represent the leaders in every line of railway specialties. We also manufacture a great many articles of our own design. The following are some of the principal factories we represent in the Eastern territory:

- R. D. NUTTALL COMPANY, PITTSBURG, PA.  
Gears, Pinions, Bearings and Trolleys.
- THE INTERNATIONAL REGISTER CO., CHICAGO, ILL.  
Fare Registers and Register Fittings.
- THE PROTECTED RAIL BOND COMPANY, PHILADELPHIA, PA.  
Flexible "Protected" Rail Bonds.
- W. T. C. MACALLEN COMPANY, BOSTON, MASS.  
"Macallen" Overhead Insulation—all designs.
- WILLIAM HALL & COMPANY, BOSTON, MASS.  
Overhead Brass Fixtures.
- STRIEBY & FOOTE COMPANY, NEWARK, N. J.  
Drop Forged Steel Specialties.
- AMERICAN ELECTRIC HEATING CORP., BOSTON, MASS.  
Electric Car Heaters of all designs.
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- SUN ELECTRIC MANUFACTURING CO., PHILADELPHIA, PA.  
Complete Line of Railway Telephones.
- BRADFORD BELTING COMPANY, CINCINNATI, OHIO.  
"Monarch" Insulating Paint.
- STERLING VARNISH COMPANY, PITTSBURG, PA.  
Insulating and Finishing Varnishes.

Our general catalogue No. 2 is pronounced the most complete and valuable Handbook of Street Railway Supplies ever issued. Have you a copy?

Our exhibit in the Madison Square Garden is located in the Eastern end of the North Gallery, where we shall be glad to see all our friends.

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**Section III**

**ELECTRICAL MACHINERY,  
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MOTIVE POWER  
SYSTEMS**

**Section VII**

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EQUIPMENT**

Brakes, Registers, Fenders,  
Wheels, Heaters, Head-  
lights, Trolleys,  
Gears, etc.

**FOR  
ALPHABETICAL  
INDEX TO  
ADVERTISERS  
SEE  
PAGES 5-6-7**

**Section IV**

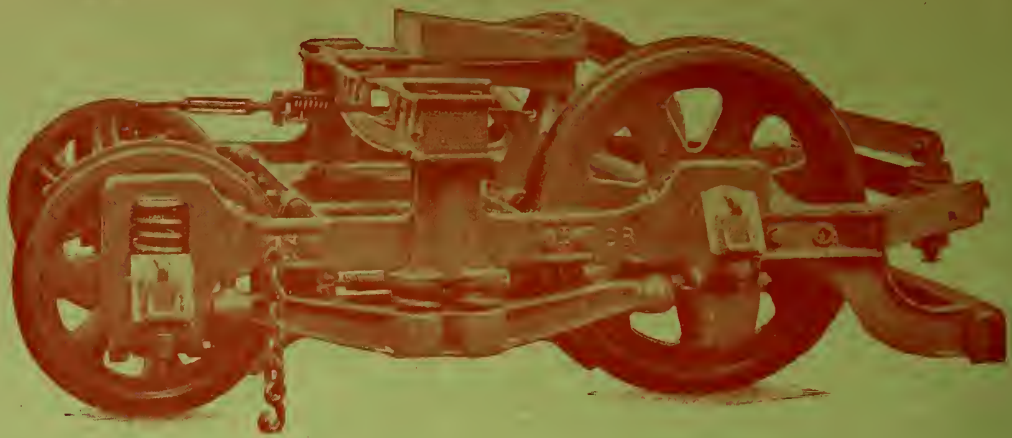
**STEAM PLANT  
EQUIPMENT  
REPAIR SHOP  
APPLIANCES**

**Section VIII**

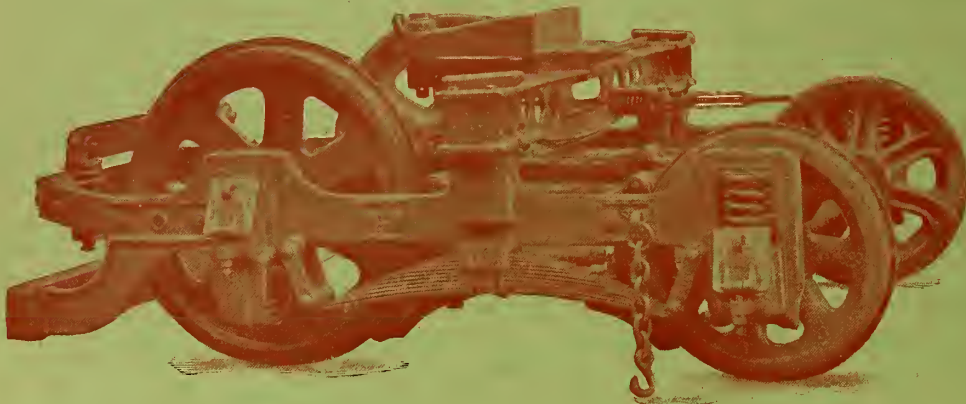
**ROLLING  
STOCK**

**Cars, Trucks, Snow  
Plows, Sweepers and  
Sprinklers**

Center Bearing  
Maximum  
Swing Bolster



Center Bearing  
Maximum  
Fixed Bolster



# THE BALTIMORE CAR WHEEL COMPANY,

BALTIMORE, M<sup>D.</sup>, U. S. A.

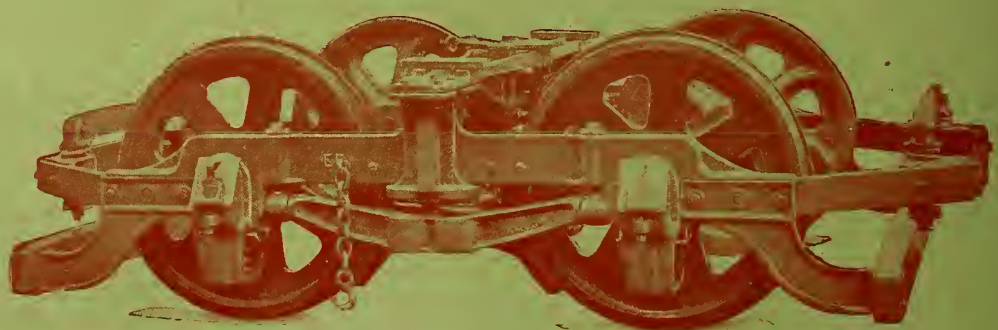
MANUFACTURERS OF

## THE LORD BALTIMORE

4-WHEEL, BOBIE AND MAXIMUM TRACTION

### ELECTRIC CAR TRUCKS

Center Bearing  
Short Wheel Base  
Swing Bolster  
One or Two  
Motors



Center Bearing  
Short Wheel Base  
Fixed Bolster  
One or Two  
Motors



# THE NILES

## Car and Manufacturing Co.

### NILES, OHIO

W. C. ALLISON, General Manager

GEO. E. PRATT, Ass't Gen'l Manager and Contracting Agent

MANUFACTURERS OF

**ELECTRIC, ELEVATED, SUBURBAN AND**  
 **STEAM PASSENGER CARS** 

**T**HE new, extensive and modern equipped works of this company will be ready for business November 15th, 1901. The floor space of the erecting shops covers nearly seven acres, the **latest modern** machinery and appliances have been installed, and the labor employed has been **carefully selected**, their experience covering long years of car construction.

A large stock of well seasoned lumber has been stored, careful attention having been given to this important branch of the business.

The construction of our cars will combine the very latest improvements and special care will be given to provide for heavy service and high speed.

Our customers are assured that every facility will be afforded them for making a **thorough and careful inspection** of their cars when under construction.

**Specifications furnished either by this company to a customer, or by the customer to this company under which cars are to be constructed will be strictly adhered to, and contracts once made will be honestly and faithfully executed. The character and quality of the materials specified by either party to a contract will be furnished, and no inferior quality substituted.**

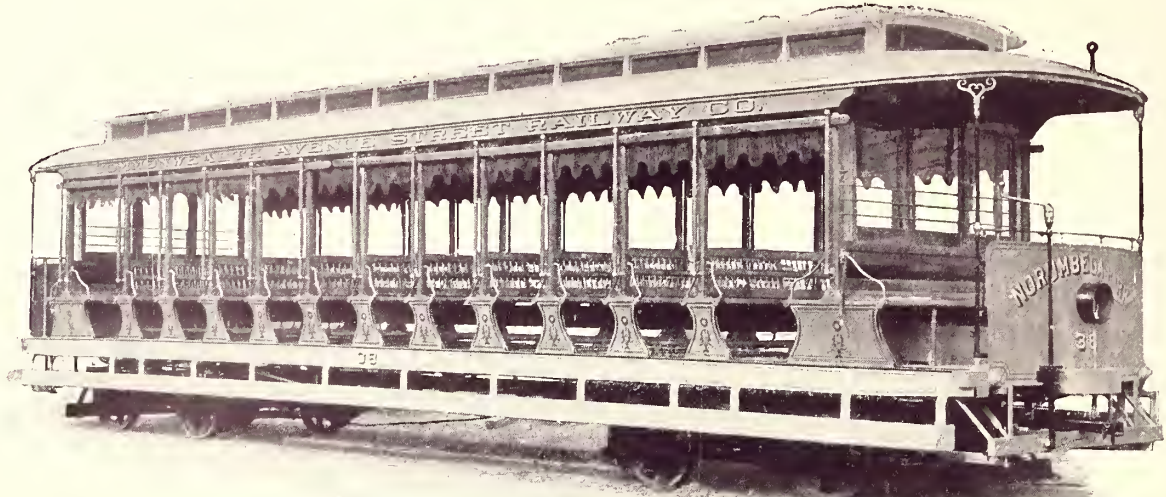
Truck, motor and other manufacturers whose appliances are to be used in connection with our cars, will be accorded every facility for handling their appliances in our works. Shipments made over the Baltimore and Ohio, Erie and Pennsylvania Railway lines. We have our own flats for shipping and electric testing line around our works.

Full and complete specifications and drawings will be furnished upon application, and a representative of the company will call on request. We will bid for equipment complete, or for car body. Prompt deliveries made.



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# J. M. JONES' SONS



...BUILDERS OF...

## HIGH GRADE CARS

FOR

## ELECTRIC RAILWAYS

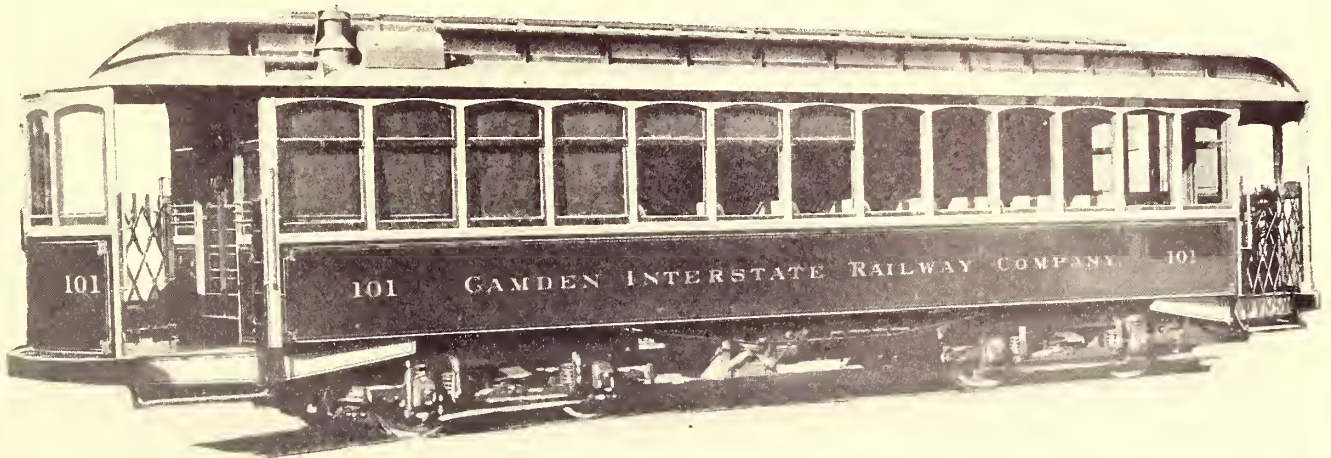


### WEST TROY, N. Y.

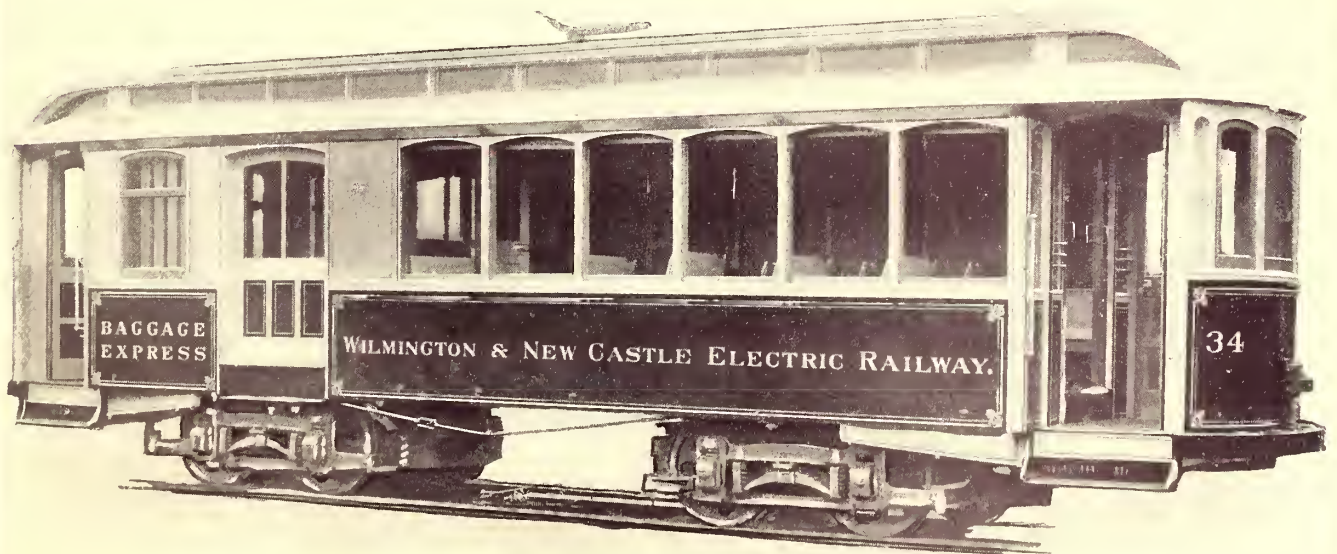
THE  
**AMERICAN CAR AND FOUNDRY CO**

Jackson & Sharp Plant

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Types of Semi-Convertible Cars. ❁ Both Upper and Lower Sash can be Lowered. ❁ The Most Satisfactory Car for Interurban Service. ❁ ❁



Builders of Any Type of Cars for Steam, Electric or Animal Traction for Either Domestic or Export Trade.

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FRANK JONES, President  
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THE LARGEST AND MOST  
COMPLETE CAR AND TRUCK  
MANUFACTURING PLANT IN  
NEW ENGLAND

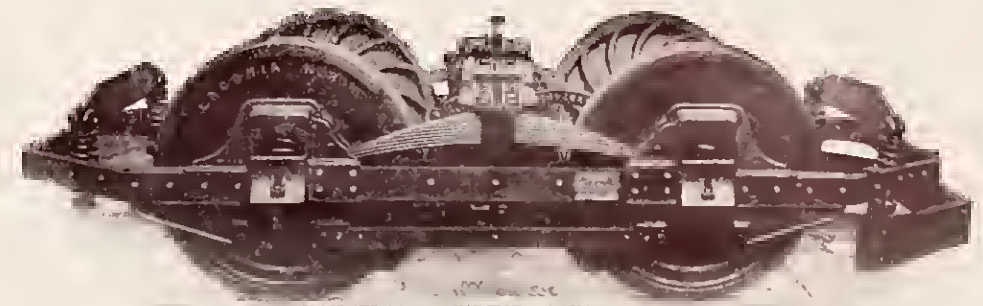
# COMPANY WORKS

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BUILDERS OF **ELECTRIC CARS**



AND **ELECTRIC TRUCKS**

MALLEABLE IRON CASTINGS FOR ELECTRICAL WORK

**MCGUIRE MFG. CO.**

Manufacturers of

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Every Condition of Service

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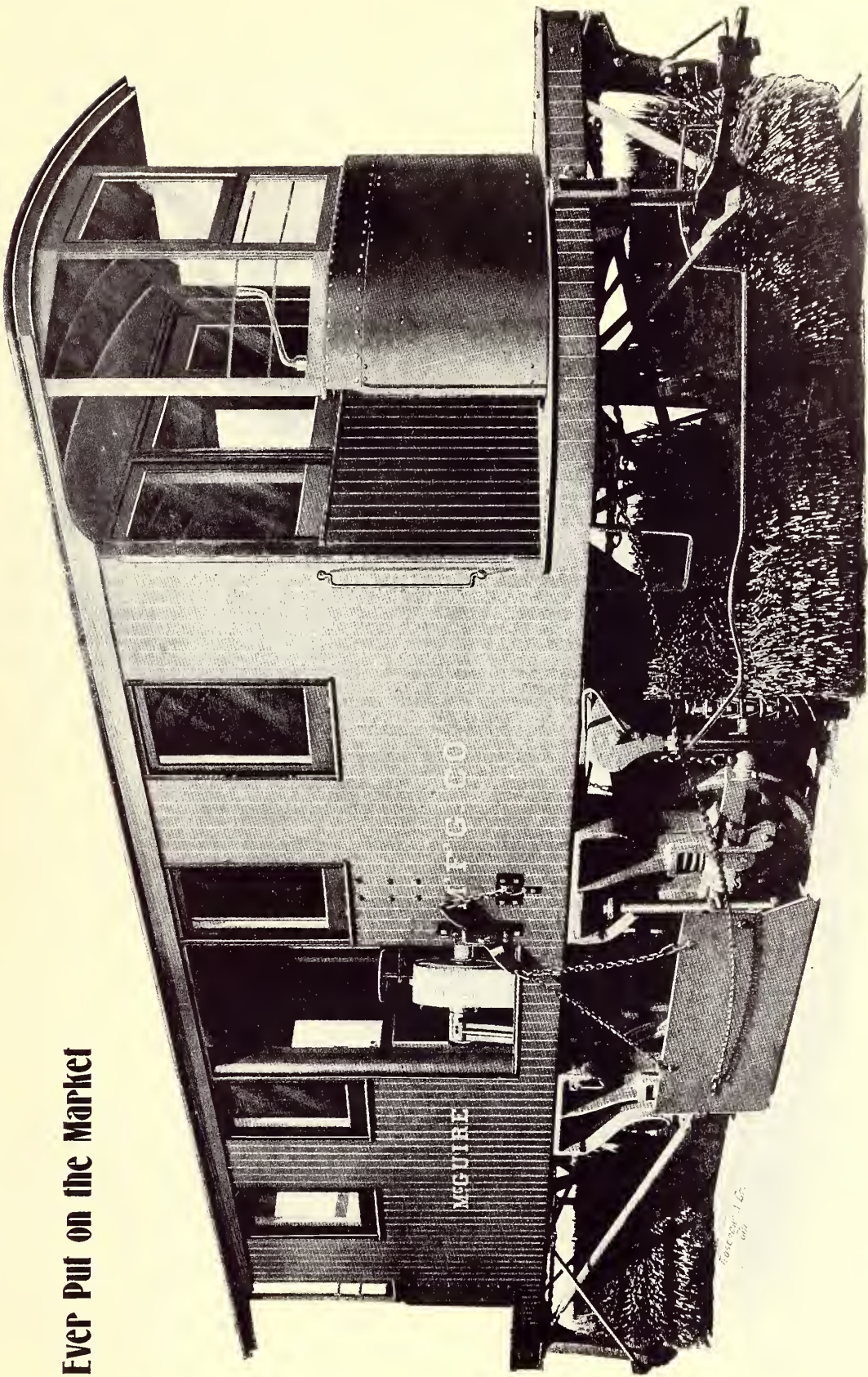
New York Office:  
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London Office:  
5 WARWICK COURT,  
HIGH HOLBORN, LONDON, W. C.

SEND FOR CUTS AND BLUE PRINTS

# THE MCGUIRE SNOW SWEEPER

Is the Best Machine Ever Put on the Market



It does the work when all others are stalled. It will pay you to investigate it if you need a sweeper. We advise getting in your order early, as we are sold up to November delivery.

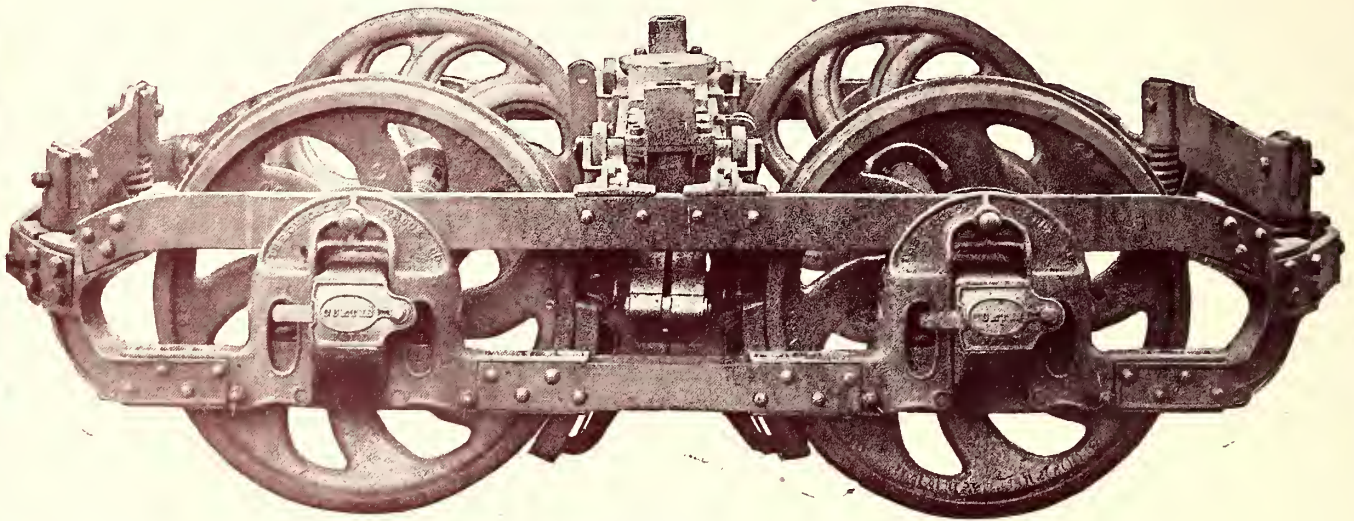
## MCGUIRE MANUFACTURING COMPANY,

### CHICAGO, ILLINOIS.

# CHICAGO TRUCK COMPANY

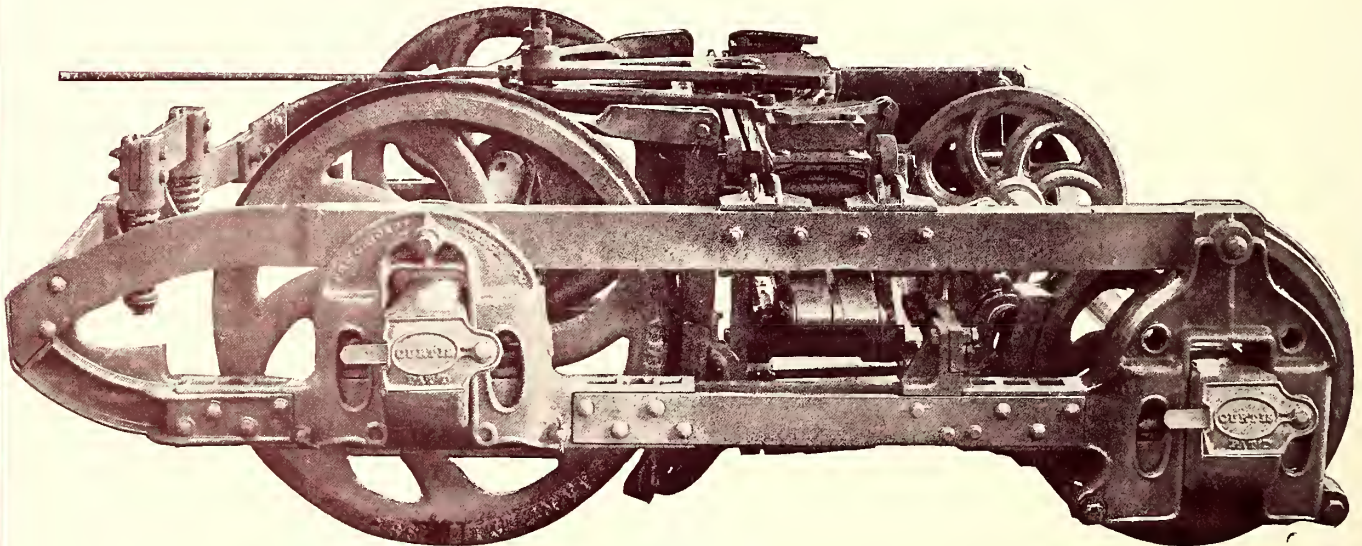
1062  
MONADNOCK BLOCK CHICAGO

Builders of Motor Trucks for  
all classes of Electric Service



**TYPE D.**

This is a short wheel base truck designed for 30 to 45 foot cars for high speed service and heavy loads.

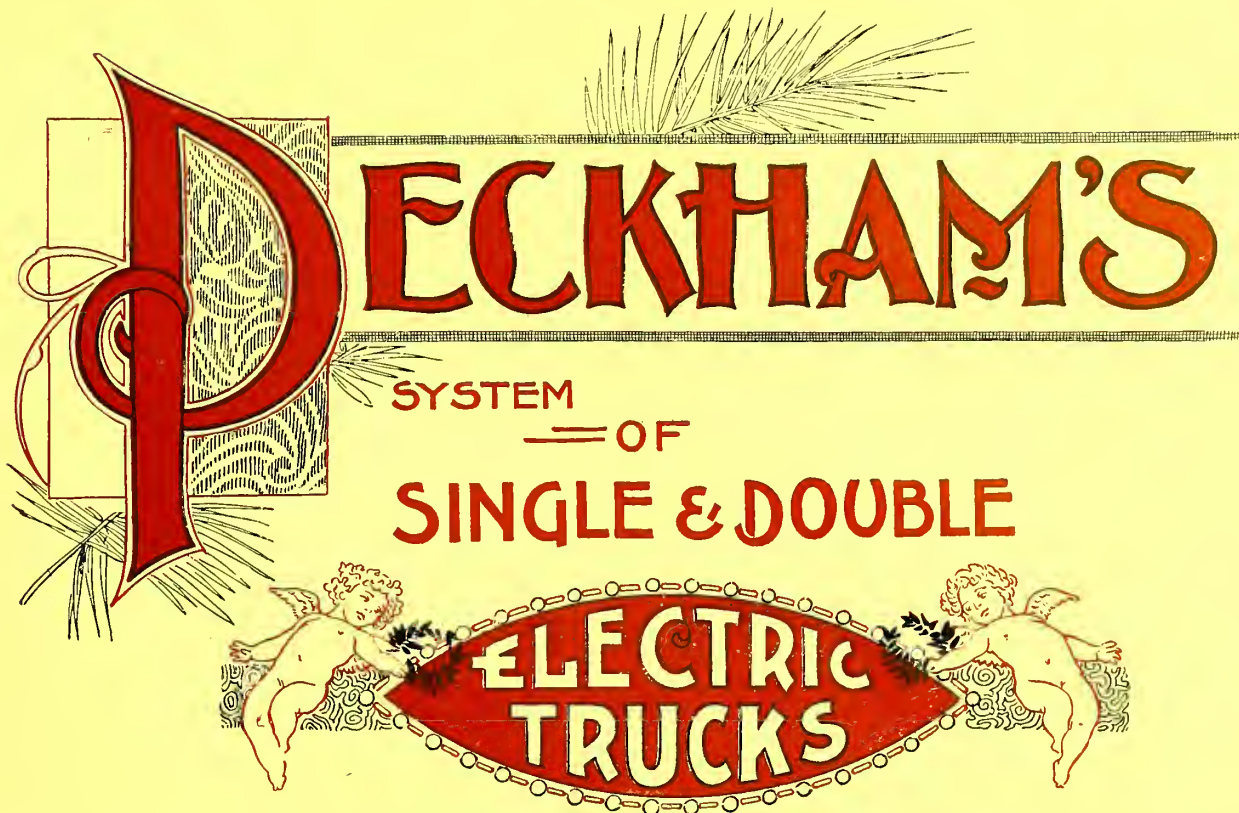


**TYPE B.**

This truck is designed for 25 to 35 foot cars. Its construction allows the car body to be carried 28 inches from the rail. It is intended that this truck be used with the small wheels in front, which enables us to get from seven to twelve inches nearer the end of the car than can be done by any other truck.

Both of the trucks shown above are absolutely *Swing Motion Trucks* and carry their load on full *Elliptic Springs*. They are positively guaranteed in every respect.

When in the market for trucks for any service, why not talk with us about it?



**P**ECKHAM'S  
SYSTEM  
— OF  
SINGLE & DOUBLE  
ELECTRIC  
TRUCKS

As exhibited at the Annual Street Car Convention held at New York City, Oct. 9-10-11, 1901.

The largest and most complete System of Electric Trucks in the World.

Adapted to any and all Conditions of Electric Service.

Adopted as Standard by the largest Electric Railways in the United States and Europe.

**OVER 15,000 IN USE IN THE  
UNITED STATES OF AMERICA**  
SATISFACTION GUARANTEED

For Descriptive Catalogue, Testimonials, Price Lists and Blue Prints, apply to

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BOSTON, 53 State Street. PHILADELPHIA, North American Bldg. CLEVELAND, OHIO, 312 Electric Bldg.  
SAN FRANCISCO, 123 California Street. LONDON OFFICE, 59 City Road, E. C.  
PARIS OFFICE, Bureau de Paris, 50 Boulevard Haussman. JAPAN, No. 12 Yokohama.  
AUSTRALIA, Melbourne and Sydney.

# PECKHAM'S

Counter-Balanced  
Cantilever Extension

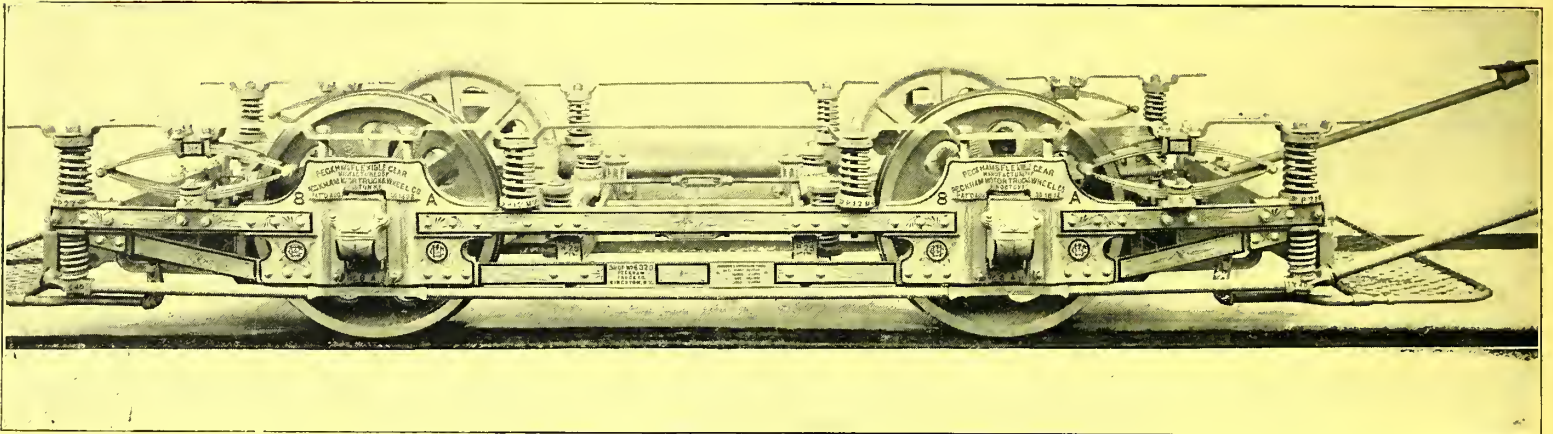
## “High Speed” Single Trucks

Especially Adapted for High Speed and Double Decked Cars. Strictly Non-Oscillating. All Parts Machine Fitted

### STANDARD

Designed for 18 to 20 Feet Closed  
and 28 to 30 Feet Open Cars

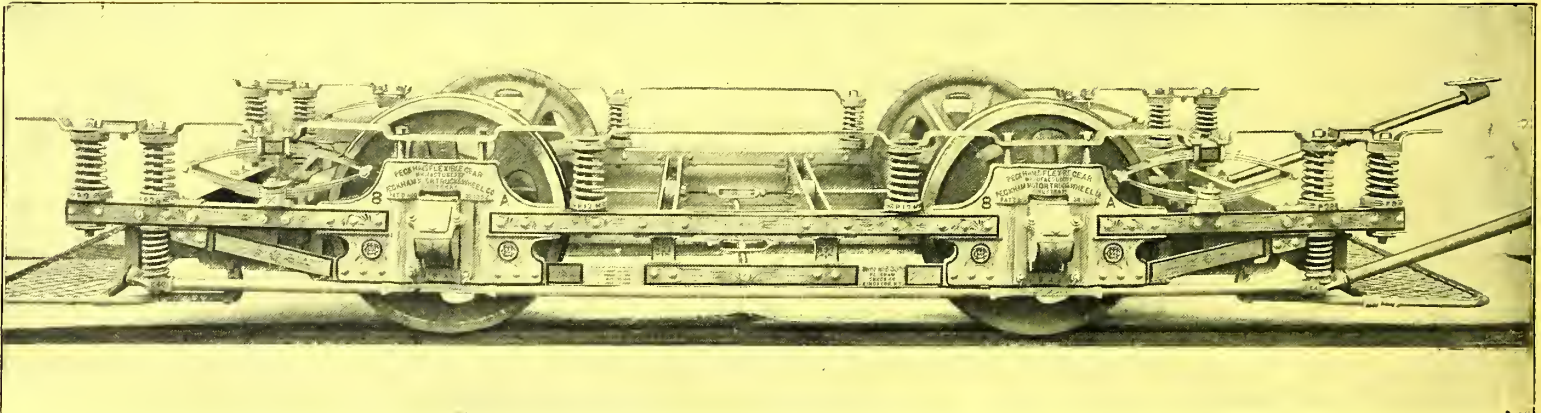
DIMENSIONS { Length, Wheel Base, 6 to 8 feet, as ordered  
" Spring Base (7-ft. Wheel Base) 13 feet 4 inches  
" Open Car Truss, to suit length of Car Body



### EXTRA LONG

Designed for 20 to 22 Feet Closed  
and 28 to 32 Feet Open Cars

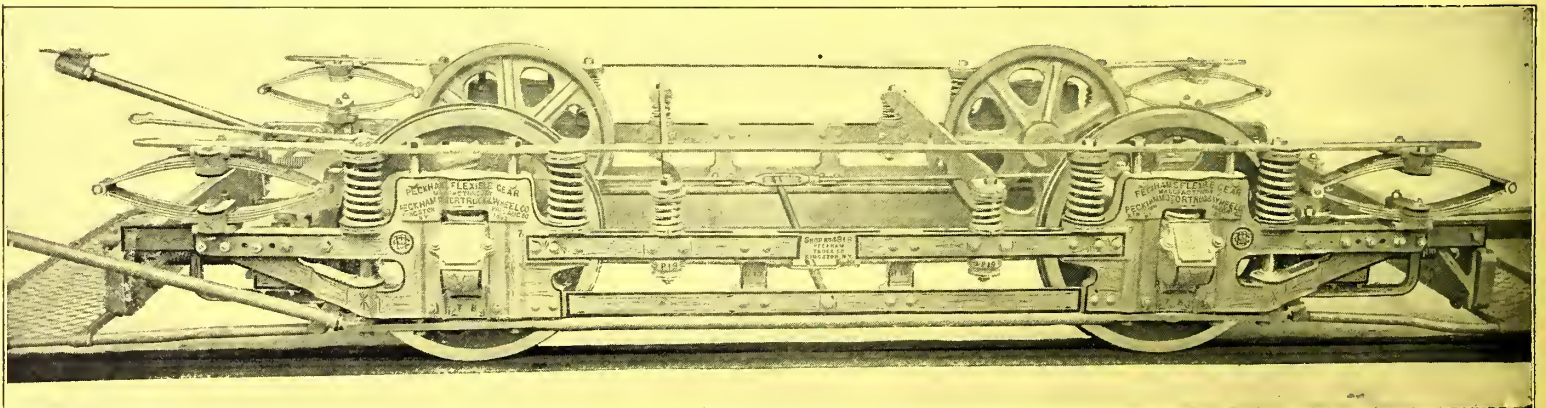
DIMENSIONS { Length, Wheel Base, 6 to 8 feet, as ordered  
" Spring Base (7-ft. Wheel Base), 14 feet 6 inches  
" Open Car Truss, to suit length of Car Body



### EXTRA STRONG, “EXTRA LONG” “Metropolitan Special”

Designed for Extra Heavy 20 to 24 Feet Closed  
and 30 to 35 Feet Open Cars

DIMENSIONS { Length, Wheel Base, 6 to 8 feet, as ordered  
" Spring Base (7-ft. Wheel Base) 14 feet 6 inches  
" Open Car Truss, to suit length of Car Body



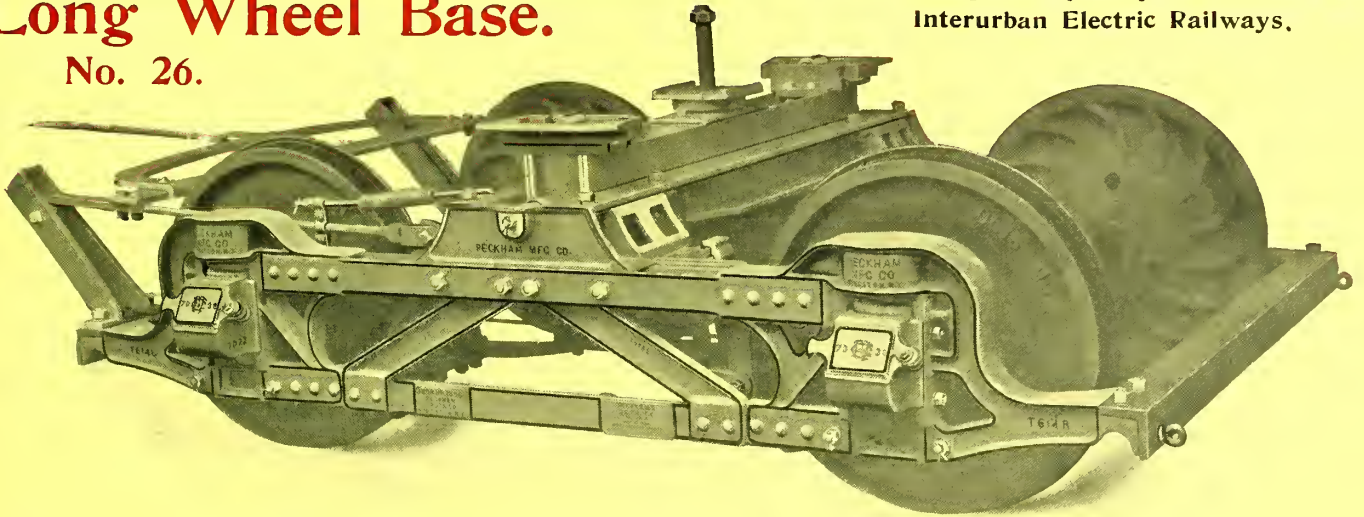
This Truck was designed expressly for the Extra Long (22 Ft. Closed—32 Ft. over all) Electric Conduit Cars of the Metropolitan Street Railway Co. of New York, where 100 are in use Making at Times a Speed of Twenty Miles an Hour without Oscillation.



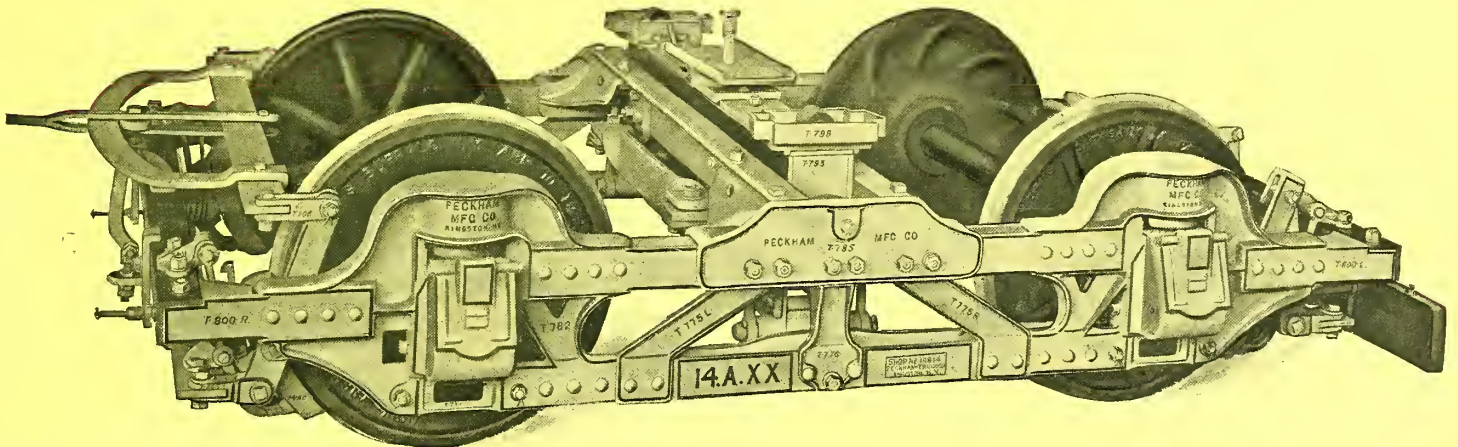
# PECKHAM'S "HIGH SPEED" DOUBLE TRUCKS

**Long Wheel Base.**  
No. 26.

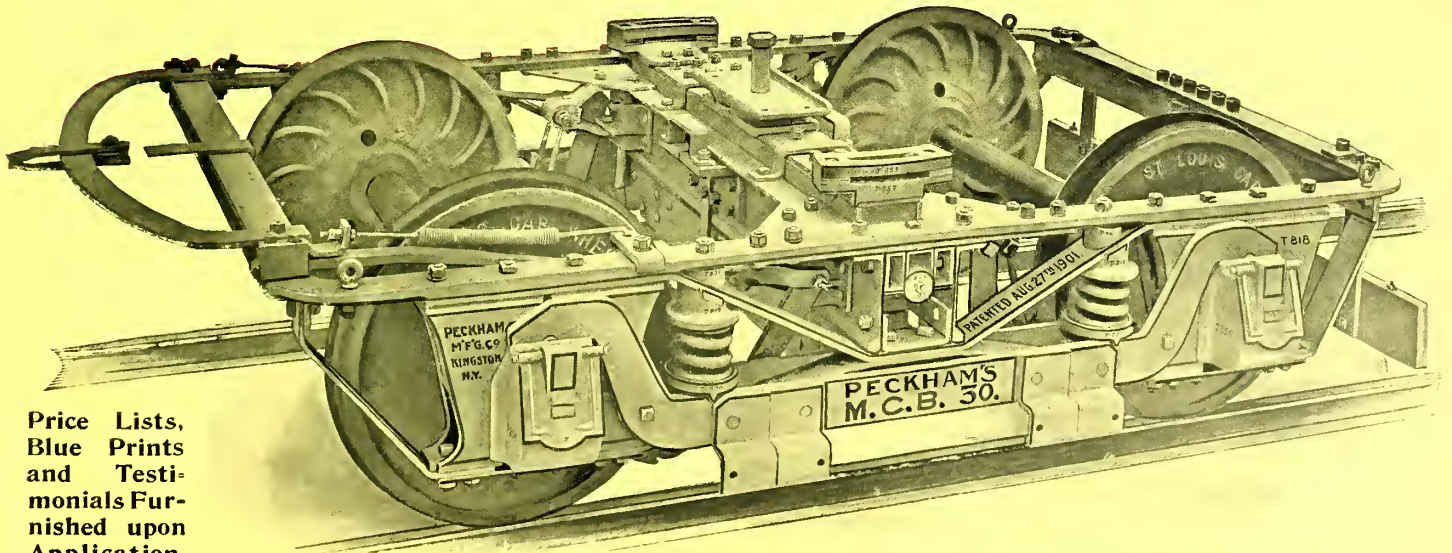
Designed Expressly for Suburban and Interurban Electric Railways.



**Extra Strong.**  
14-A-X-X.



**Long Wheel Base.**  
M. C. B.-30.



Price Lists,  
Blue Prints  
and Testi-  
monials Fur-  
nished upon  
Application.

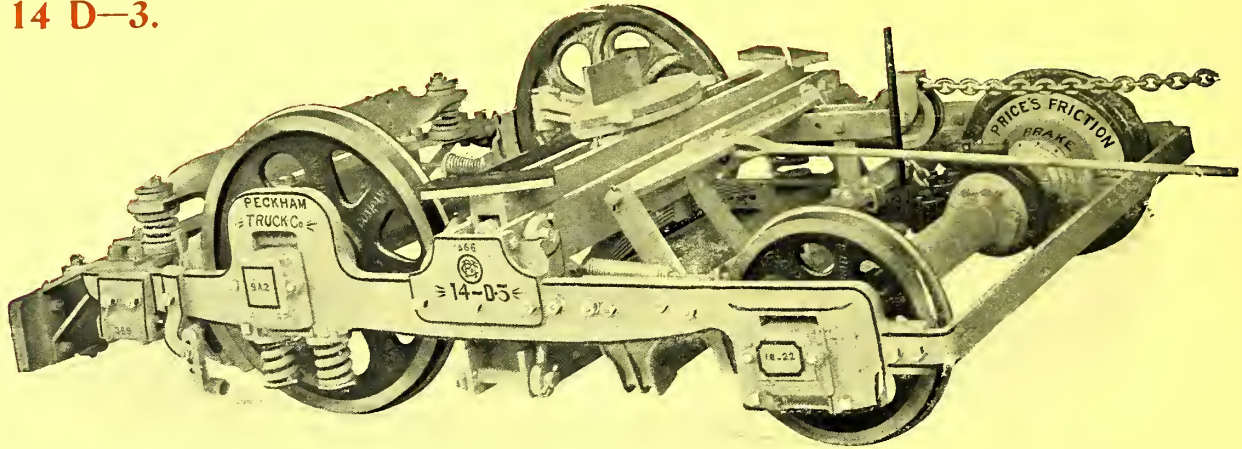
Guaranteed to handle successfully the Heaviest 45 to 60 foot electric cars running at a speed of 40 to 70 miles an hour

# PECKHAM'S "Centre Bearing" "Swing Bolster" Double Trucks

## "Standard" Maximum-Traction.

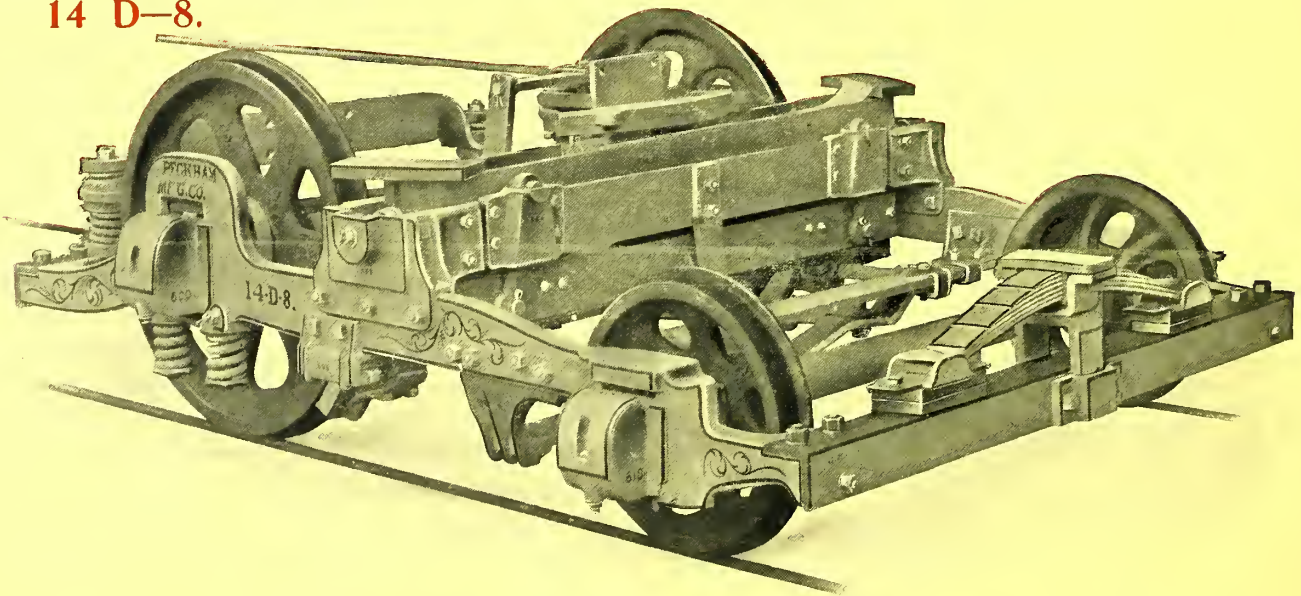
14 D-3.

Designed expressly for light weight, medium and extra heavy city and suburban electric cars. Equipped with Price Friction Power Brake.



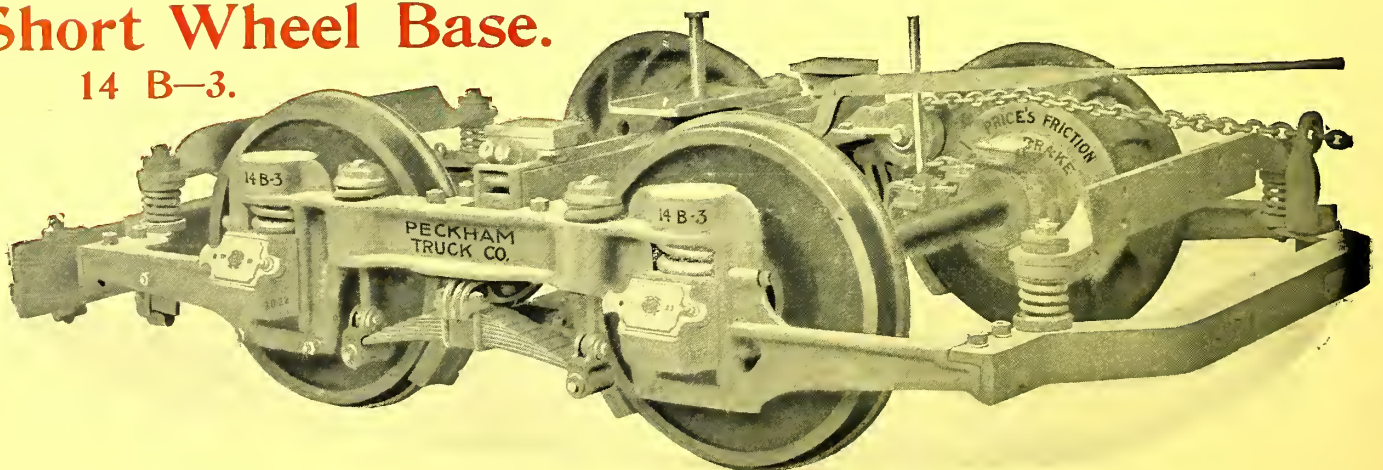
## "Extra Strong" Maximum-Traction.

14 D-8.



## Short Wheel Base.

14 B-3.



The Strongest, Easiest Riding and Most Economical "Maximum Traction" and "Short Wheel Base" Trucks in use. Price Lists, Blue Prints, etc., furnished upon application

# A Year of Progress

**A**BOUT twelve months ago the John Stephenson Company was re-organized with Joseph C. Willetts as President and Peter M. Kling as General Manager.

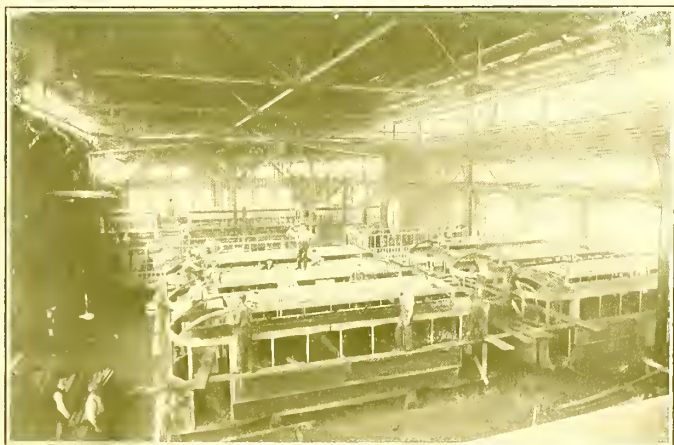
The policy of the new management has been, and will continue to be, both progressive and conservative—progressive as regards that enterprise in the obtaining of orders and increase in manufacturing facilities by which alone any business establishment can do full justice to itself and its patrons; and conservative to the extent of continuing unimpaired that policy of honest material and excellent mechanical construction with which for years past the name of Stephenson has been associated.

As a logical result of this policy, it has been found necessary to increase greatly the manufacturing facilities, until the present capacity of the buildings is double that of a year ago.

Two interior views, showing portions of the shops, are presented herewith. There is now floor room for 100 cars, under construction—a capacity absolutely necessary for the prompt executing of present and prospective orders.

The advantageous location of the works, as regards both transportation facilities and labor supply, is another important consideration.

A few words regarding our cars and trucks will be found on the two following pages.



## JOHN STEPHENSON COMPANY

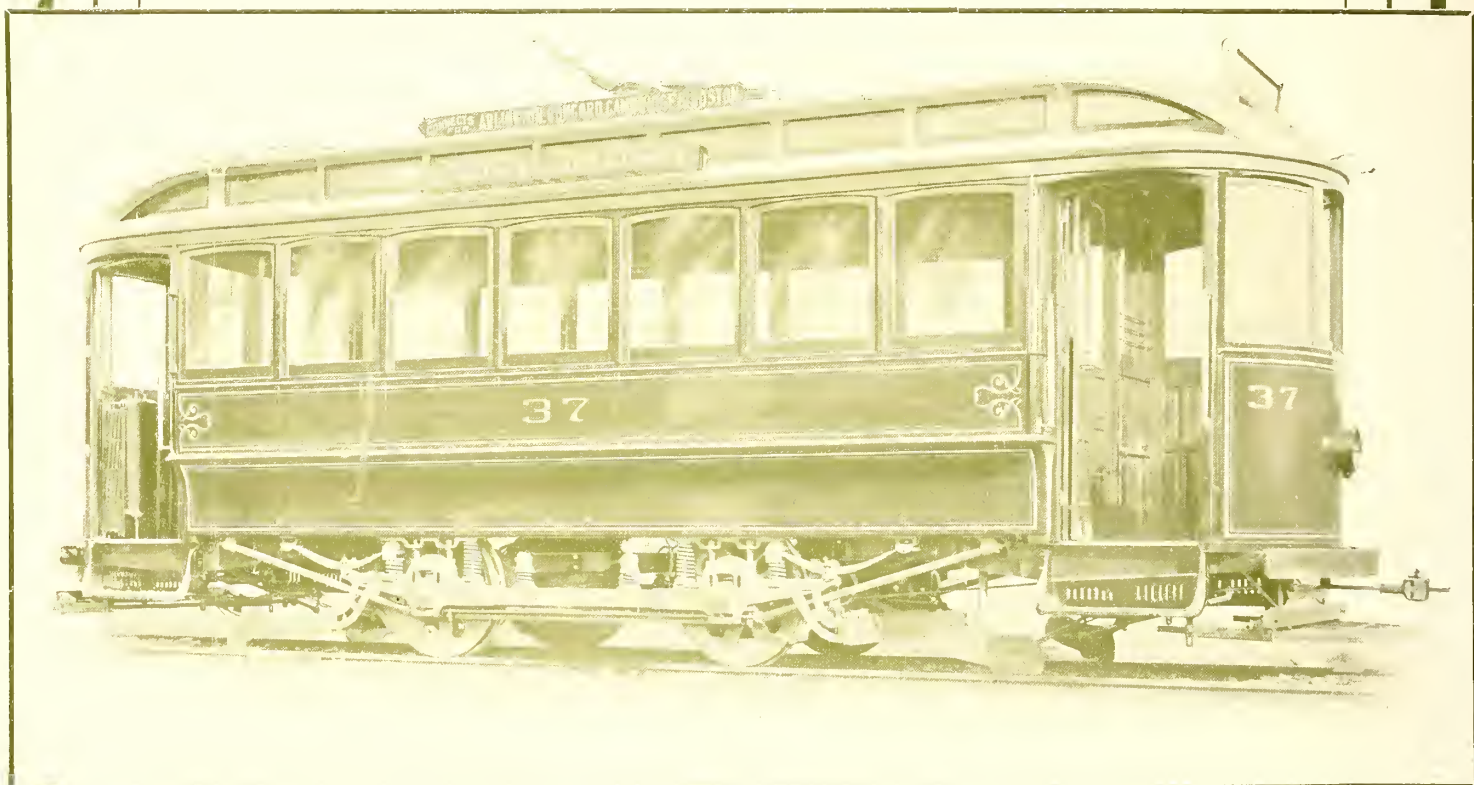
New York Office, 16-18 Exchange Place.

Factory and Office, Elizabeth, N. J.

# The Cars We Build

**T**HE John Stephenson Company has not only the facilities but the **disposition** to build cars of the kind which every enterprising electric railway official wishes to see on his road—cars handsome in appearance, substantial in construction, and strictly up-to-date in every respect

The ultimate, and even immediate, economy of such cars is becoming more and more apparent every year, not only to the operating heads of electric railway companies, but to the financial interests in control of those properties. Stephenson cars will not only carry your present traffic in a most satisfactory manner—they will assist you materially in increasing that traffic.



The importance of thoroughly seasoned timber in car construction is nowhere more fully recognized than at the Stephenson works. Lumber of all kinds—between five and six million feet of it—mostly from eight to ten years old—is at present on hand. Additions are, moreover, constantly being made to the stock, so that the supply will always be retained.

In the various buildings of our present plant, all the latest improvements have been introduced, including numerous labor-saving appliances of the most improved type. We are thus enabled to build cars at the lowest prices you can afford to pay—the lowest prices consistent with Stephenson workmanship and material.

## JOHN STEPHENSON COMPANY

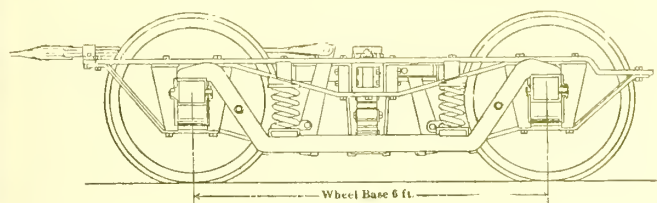
New York Office, 16-18 Exchange Place.

Factory and Office, Elizabeth, N. J.

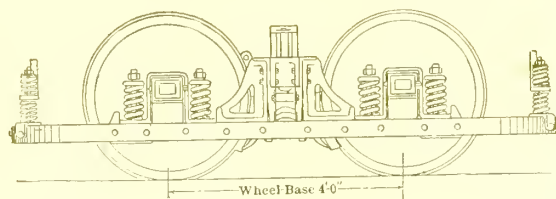
# Our Improved Trucks

**T**HE present management of the John Stephenson Company has designed four new types of trucks, intended for high speed, four motor work. These trucks are built on original lines, although they contain all the important features of M. C. B. construction, such as equalizing bars, swing bolsters, and perfect accommodations for the brake mechanism.

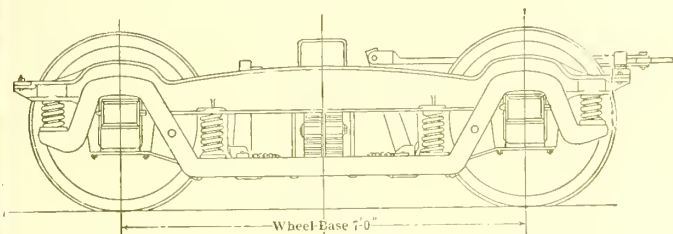
In the No. 6 and No. 12 Trucks, intended especially for interurban work, the motors are hung inside of the axles. The frame of the former is of wrought iron, and set low enough to allow the truck being used on a one step car. The No. 12 truck is of exceptionally heavy design, intended for the severest interurban service. It will accommodate the largest motors built, and



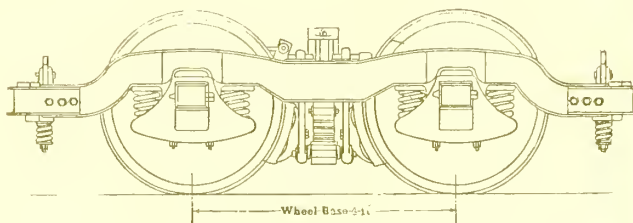
No. 6.



No. 10.



No. 12.



No. 20.

has exceptionally powerful brakes. It will ride as easy, at any rate of speed, as a six-wheel Pullman.

In the No. 10 and No. 20 trucks, the motors are hung on the outside of the axles. The No. 10 is designed especially for use on narrow cars and streets, and short radius curves. There is no interference of any kind with the oil boxes, enabling the truck to swing in a very small space. An especial advantage of the No. 20 truck is its scientific distribution of springs—making it superior to any other 4-ft. wheel base truck on the market.

We believe that one of these four types of trucks will meet your requirements better than they have ever been met before. Let us send you further information.

## JOHN STEPHENSON COMPANY

New York Office, 16-18 Exchange Place.

Factory and Office, Elizabeth, N. J.

# LACLEDE CAR CO., ST. LOUIS, MO.

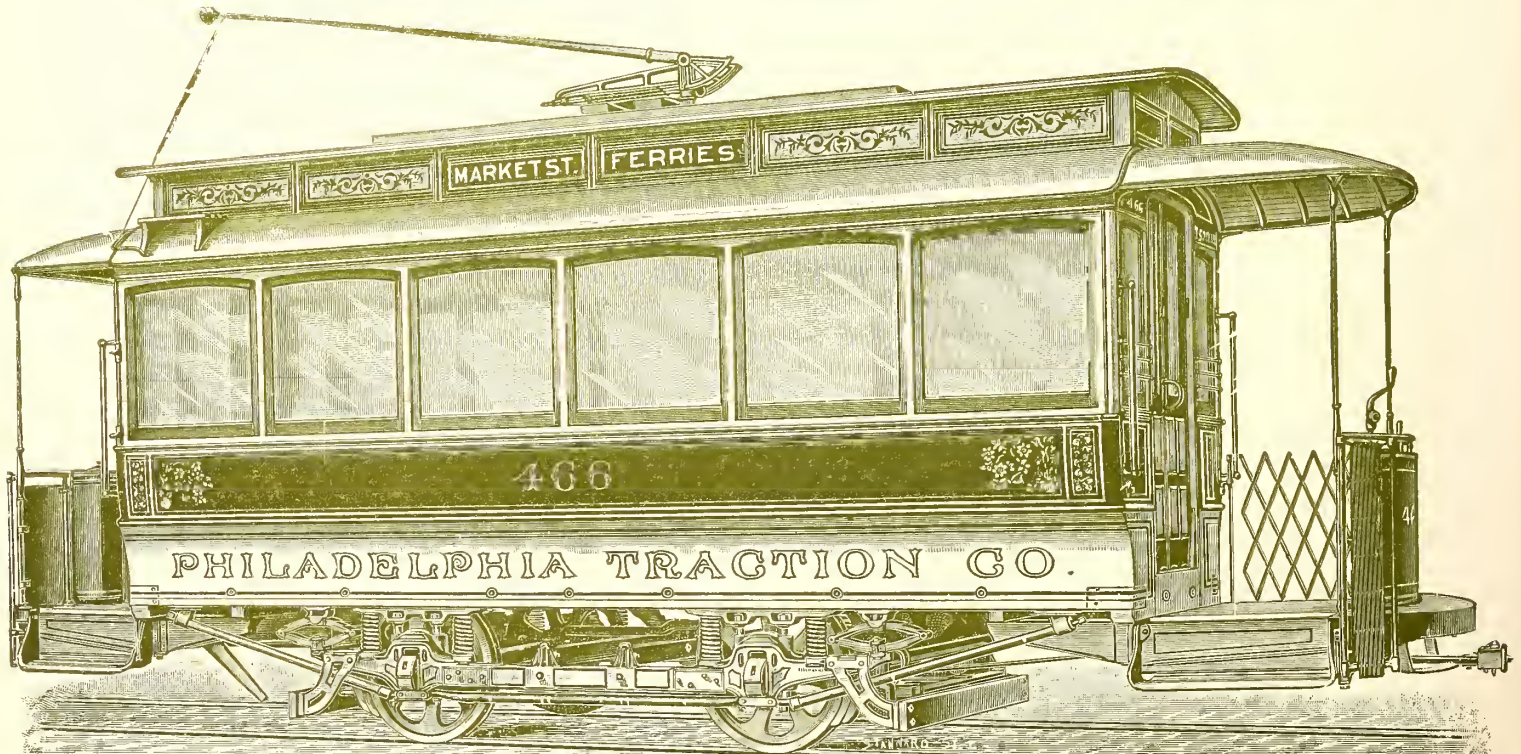
BUILDERS OF

ELECTRIC  
CARS



AND  
TRUCKS

INTERIOR OF PHILADELPHIA "MARKET STREET" CAR



THIS CUT REPRESENTS ONE OF THE 1000 CARS BUILT FOR THE PHILADELPHIA TRACTION CO.  
ALL ORDERS PROMPTLY AND CAREFULLY EXECUTED.

# LACLEDE CAR CO., ST. LOUIS, MO.

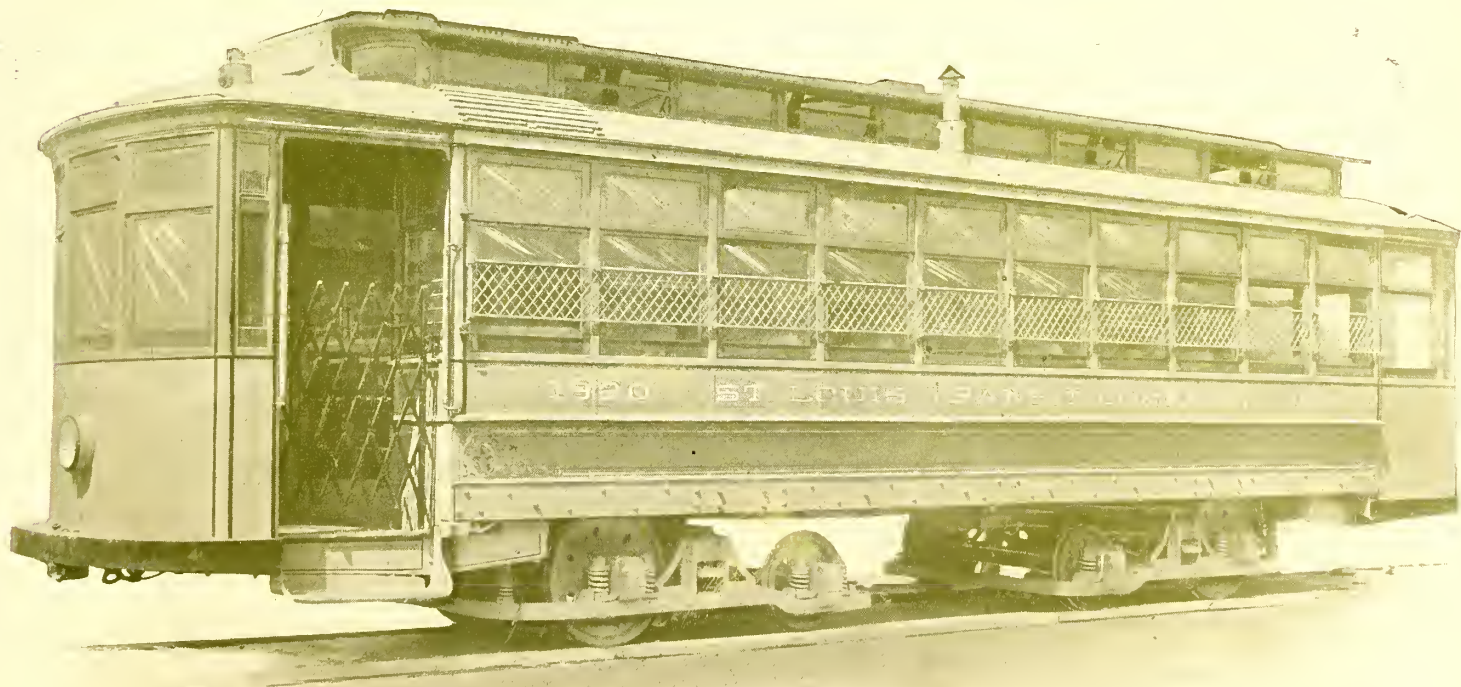
BUILDERS OF

ELECTRIC  
CARS



AND  
TRUCKS

INTERIOR OF CARS BUILT FOR THE ST. LOUIS TRANSIT CO.



THIS CUT REPRESENTS ONE OF THE 70 CLOSED CARS BUILT FOR THE ST. LOUIS TRANSIT CO.  
WRITE FOR PRICES AND SPECIFICATIONS.

# ST. LOUIS CAR CO.

## GENERAL OFFICES:

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GEO. J. KOBUSCH, President and Treasurer.  
H. F. VOGEL, General Manager.  
CHAS. E. FRITSCH, Secretary.  
WARNER S. McCALL, General Sales Agent.

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The only complete and perfect Arc Headlight on the market to-day. It is perfectly simple and automatic and will burn with a drop in the voltage of 200 to 250 volts. Only requires one to one and a half amperes current.

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NEW YORK, F. Wm. Suow, 1314 Havemeyer Building.  
MEXICO, I. M. Hutchison, Apartado 2098.  
ST. LOUIS, Western Ry. Equipment Co., Union Trust Building.

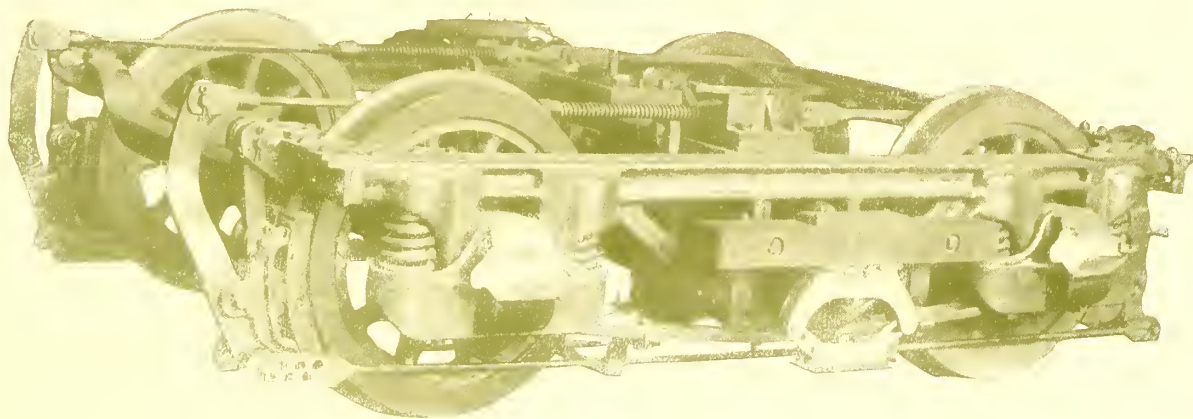
### FOREIGN OFFICES:

H. H. Boeker & Co., = = Berlin, Germany.  
M. Bramson, = = = Warschau, Russia.



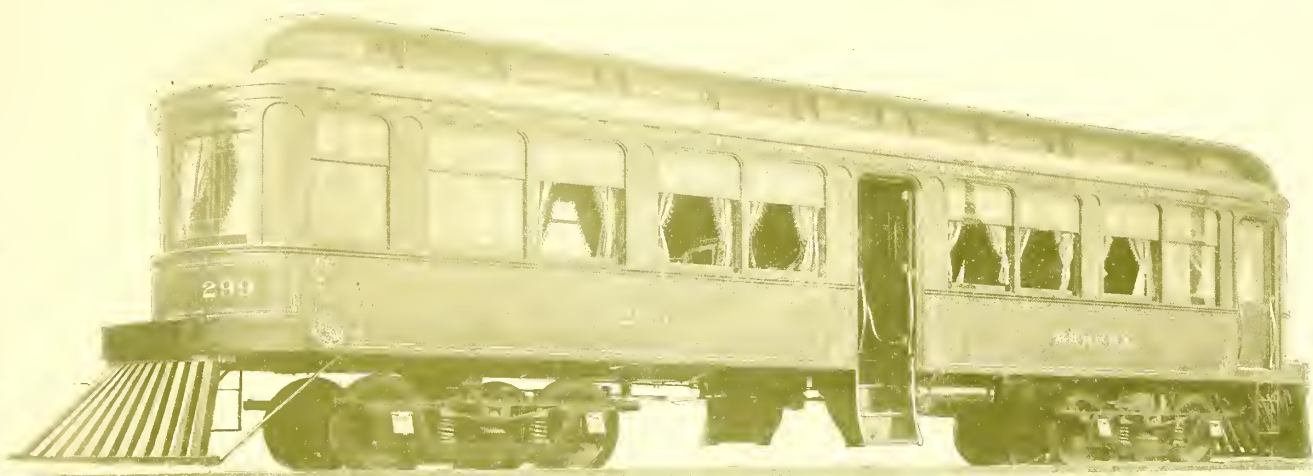
# ST. LOUIS CAR CO.

ST. LOUIS, U. S. A.



St. Louis Car Company's Hendley Truck, for heavy high speed service.  
Adopted by the Northwestern Elevated Railroad, Chicago.

## Coach and Truck Builders



New Parlor Car for Union Traction Co. of Indiana.

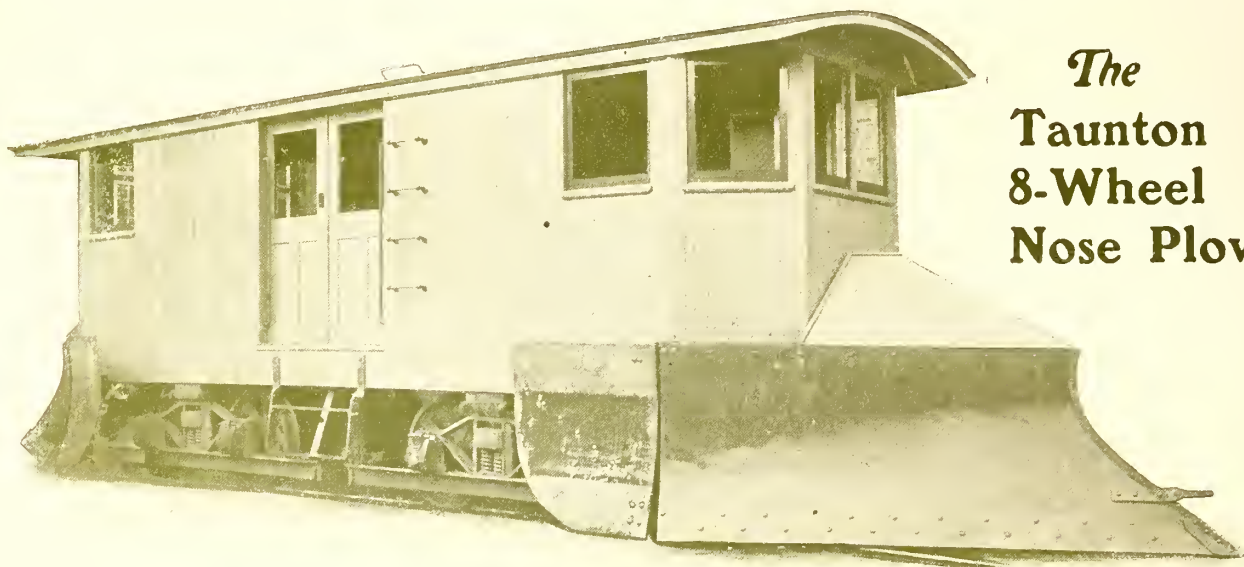
...ALSO MANUFACTURERS OF...

## SPIRAL JOURNAL BEARINGS

Especially Designed for Any Truck in the Market.  
Guaranteed to Outwear Any Phosphor Bronze Bearing.

CORRESPONDENCE SOLICITED.

# TWO POPULAR TYPES OF TAUNTON SNOW PLOWS

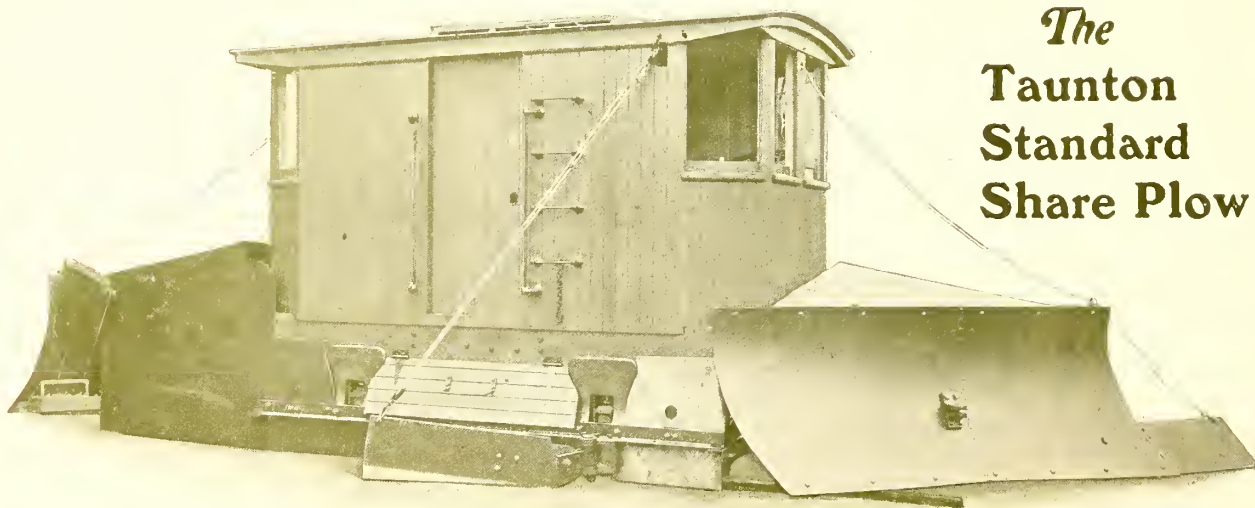


*The*  
**Taunton  
8-Wheel  
Nose Plow**

In response to a demand for a plow that should have eight points of contact with the rails, have more weight than can be properly carried on four wheels, and be able to make fast schedule time, we have designed the plow shown above.

By a simple and ingenious arrangement of levers, the digger, though fastened to the truck and operated from the house, will follow the rail on curves as well as on straight track.

The nose when operated by compressed air can be suspended at any height and held in position independently of the lifting mechanism. When operated by hand the worm and gear hold the nose at any given point.



*The*  
**Taunton  
Standard  
Share Plow**

This plow has the same cab, frame and running gear as the Standard Nose Plow and is for all around double track work. The Share is nearly four feet high and has a good lifting roll.

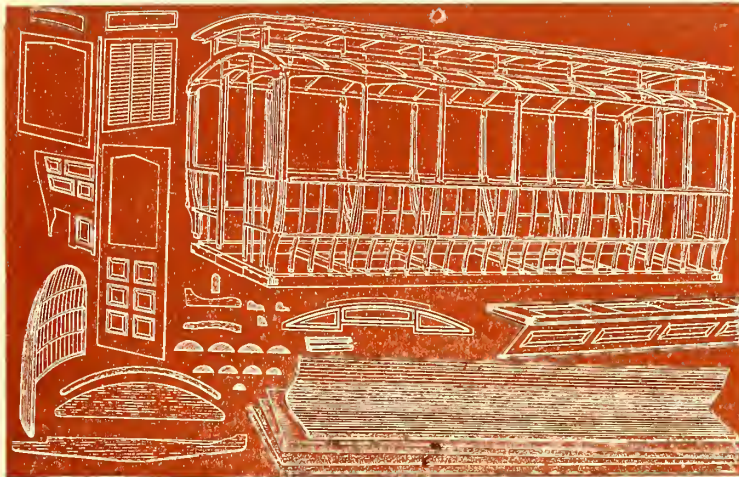
The Share Extension is raised and lowered by a single rope from the cab. The Snow Shield or Casing is in two parts, one fastened to the body or frame, the other to the Share, and the two parts make a sliding joint with each other.

Built by the

## TAUNTON LOCOMOTIVE MANUFACTURING CO.

TAUNTON, MASS., U. S. A.

Selling Agents, WENDELL & MacDUFFIE, 26 Cortlandt St., New York.

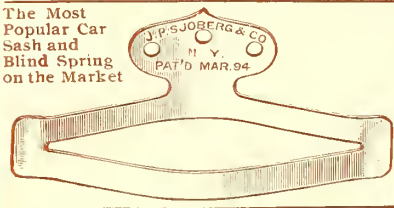


**J. P. SJOBERG & CO.**

145 and 147 Eleventh Ave., NEW YORK,  
MANUFACTURERS OF

**STREET CAR WOOD WORK**

The Most Popular Car Sash and Blind Spring on the Market



For Repairs Rebuilding and Stationary Vestibules

Also Portable Vestibule Fronts Complete

**CALIFORNIA CAR WORKS**

J. HAMMOND & CO.,  
SAN FRANCISCO, CAL.

Manufacturers of



**ELECTRIC CARS  
CABLE CARS  
AND TRUCKS**



**Baldwin=Westinghouse  
Electric Locomotives**

Baldwin Locomotive Works  
PHILADELPHIA, PA.

Westinghouse Electric & Mfg. Co.  
PITTSBURG, PA.

See Westinghouse Advertisements in Every Section of this Book.

**F. E. HUNTRESS**

General Eastern  
Agent

**St. Louis Car Co.**

716 Broad Exchange Building  
NEW YORK

8 Oliver Street .. .. BOSTON

See page 242 of this issue.

**SOME LEADING EUROPEAN MANUFACTURERS OF TRAMWAY ROLLING STOCK**

- ALLGEMEINE ELEKTRICITÄTS-GESELLSCHAFT, Berlin, Germany.
- BRITISH ELECTRIC CAR CO., Ltd., London.
- BRITISH THOMSON-HOUSTON CO., Ltd., London.
- BRITISH WESTINGHOUSE ELECTRIC & MFG. CO., Ltd., London.
- BRUSH ELECTRICAL ENGINEERING CO., Ltd., London.
- DICK, KERR & CO., Ltd., London.
- ELECTRIC RAILWAY & TRAMWAY CARRIAGE WORKS, Ltd., Preston, England.
- EUROPEAN MCGUIRE MFG. CO., London.
- GEORGE F. MILNES & CO., Hadley and Birkenhead, England.
- MATHER & PLATT, Ltd., Manchester, England.
- MILLER & CO., Ltd., Edinburgh, Scotland.
- ROBERT W. BLACKWELL & CO., Ltd., London.
- SOCIÉTÉ IND STRIELLE D'ELECTRICITÉ PROCÉDÉS WESTINGHOUSE, Paris, France.
- UNION ELEKTRICITÄTS-GESELLSCHAFT, Berlin, Germany.
- WESTERN ELECTRIC CO., London.

**FOR EUROPEAN ADVERTISEMENTS, SEE PAGES 34-102 OF THIS ISSUE.**



**JEWETT**  
NEWARK,

**CAR CO.**  
OHIO, U.S.A.



# BEMIS:::

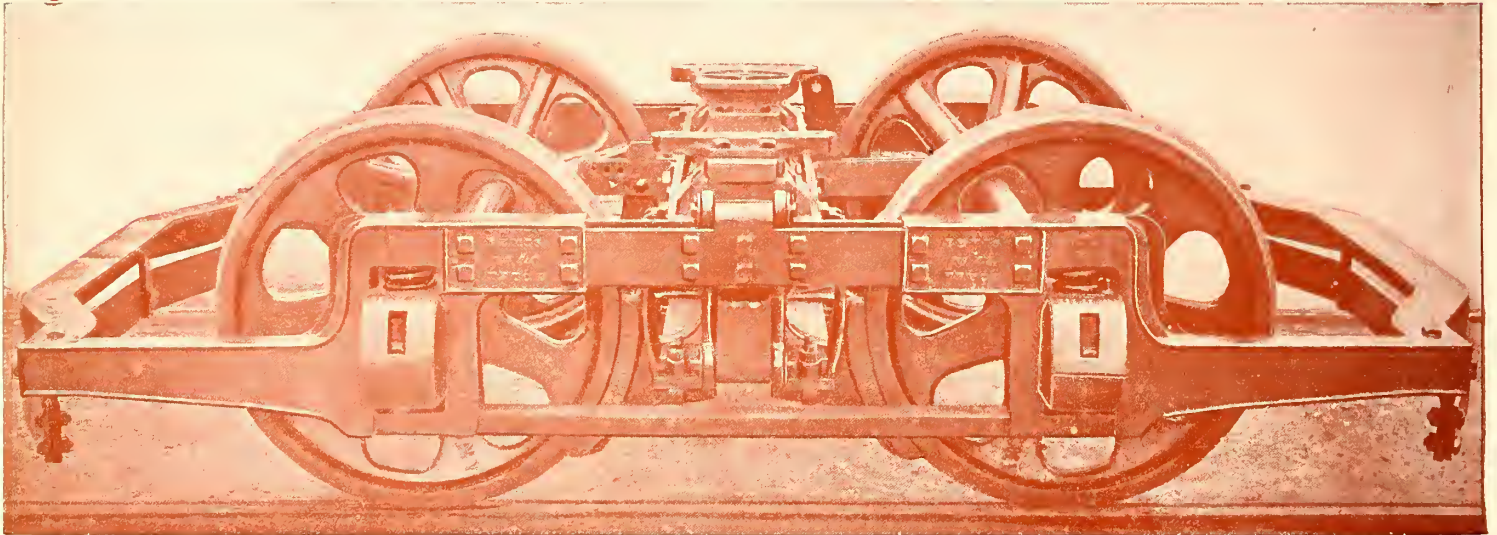
HIGH-GRADE

# TRUCKS

For all kinds of Service

ARE  
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FOR

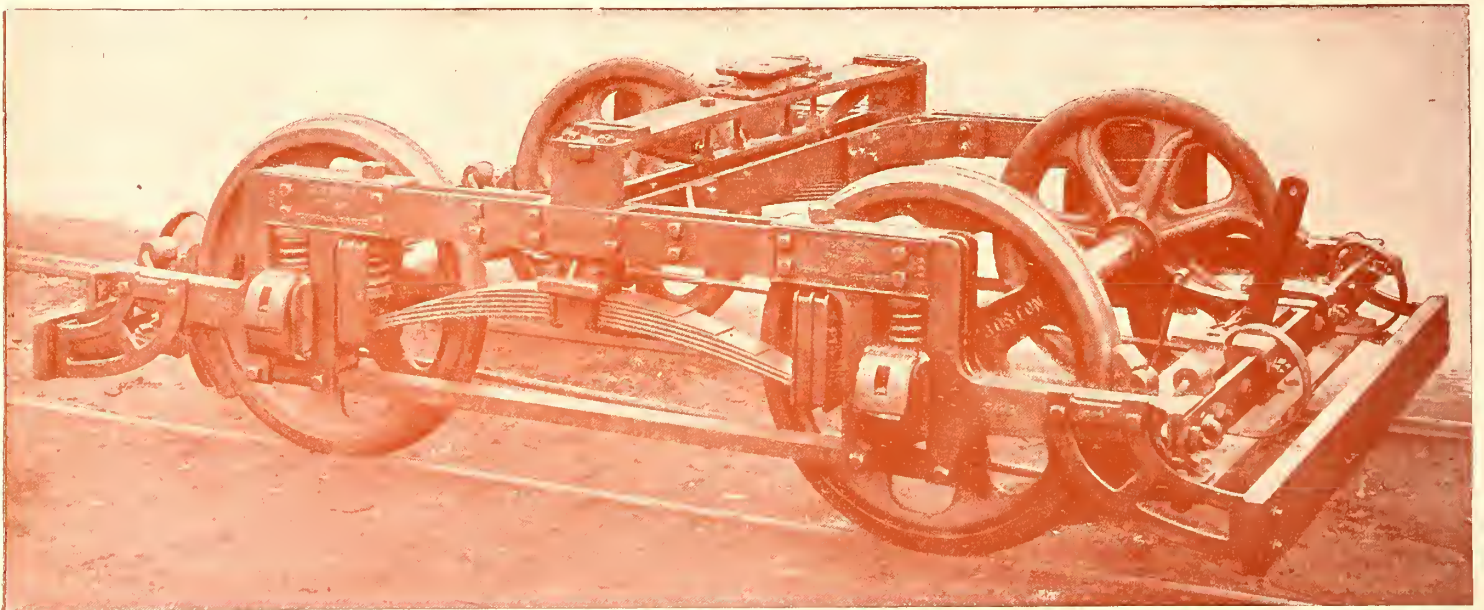
SIMPLICITY, STRENGTH,  
EASY MOTION, POWER-  
FUL BRAKES, and LOW  
COST OF MAINTENANCE



**No. 44 Truck for Open or Box Cars.**

4' and 4' 6" WHEEL BASE.

Designed to meet special requirements of Long Open Cars where low steps are required. Carries car no higher than single truck. Short Wheel Base. Easy Riding. Takes Curves Smoothly. Swing Motion. Quick Acting, Powerful Brake.



**No. 40 Truck for Open or Box Cars.**

4', 4' 6" and 5' 0" WHEEL BASE.

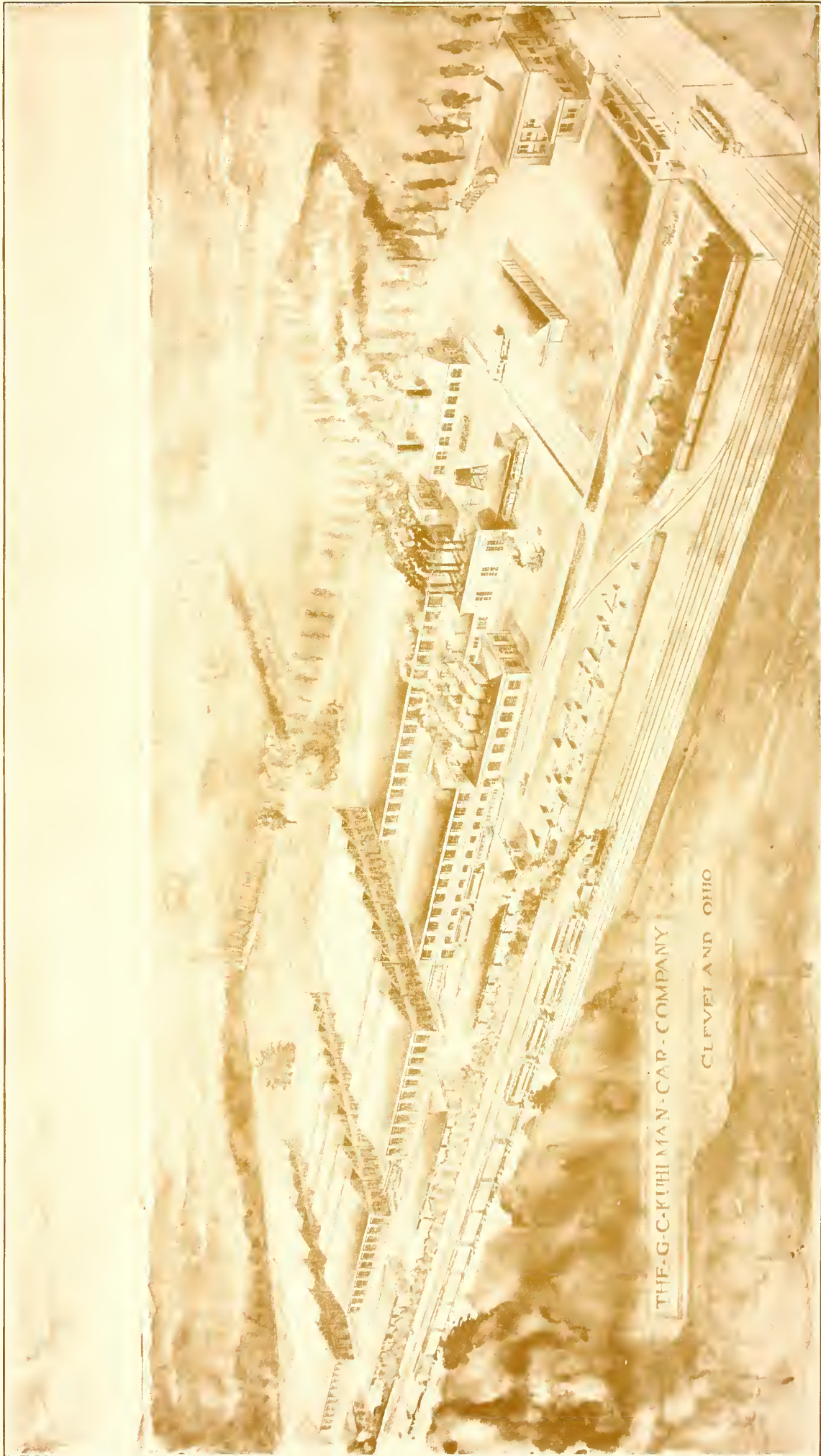
## The BEMIS CAR BOX CO.

MANUFACTURERS  
BEMIS DUST PROOF,  
SELF-OILING  
JOURNAL BOXES

**Springfield,  
Mass.**

BOSTON OFFICE:  
317 EXCHANGE BUILDING.  
THOMAS F. CAREY, Agent.  
LONDON OFFICE:  
97 QUEEN VICTORIA STREET.  
P. NELL, Agent.





The New Plant of the G. C. KUHLMAN CAR CO., Cleveland, Ohio.

Two Grand Prizes  
at Paris 1900.

One for Brill Con-  
vertible Car. One  
for Brill System of  
Electric Trucks.

# BRILL CARS AND TRUCKS

"Highest in Quality."

J. G. BRILL COMPANY  
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Address Cablegrams:  
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London, E. C., England  
Telegraphic Address:  
"Axles, London"

F. A. Lawson & Co.  
23 Davis Street  
San Francisco, Cal.  
Selling Agents for  
San Francisco

## THE BRILL CONVERTIBLE CAR.

Suited to Every Season and All Conditions of Weather.



The Brill Convertible Car Open for Summer Use.

When Open, has every good point of a Standard Open Car.  
Has a Low Step at the Platform. Sash and Panels out of the way.  
**INTERIOR LIGHT AND OPEN.**



Brill Convertible Car Closed for Winter Service.

When Closed, becomes a Standard Box Car.  
The Change can be made in a Few Minutes. No Storage of Either Sash or Glass.  
**Only One Equipment Necessary.**



Two Grand Prizes  
at Paris 1900.

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for Brill System of  
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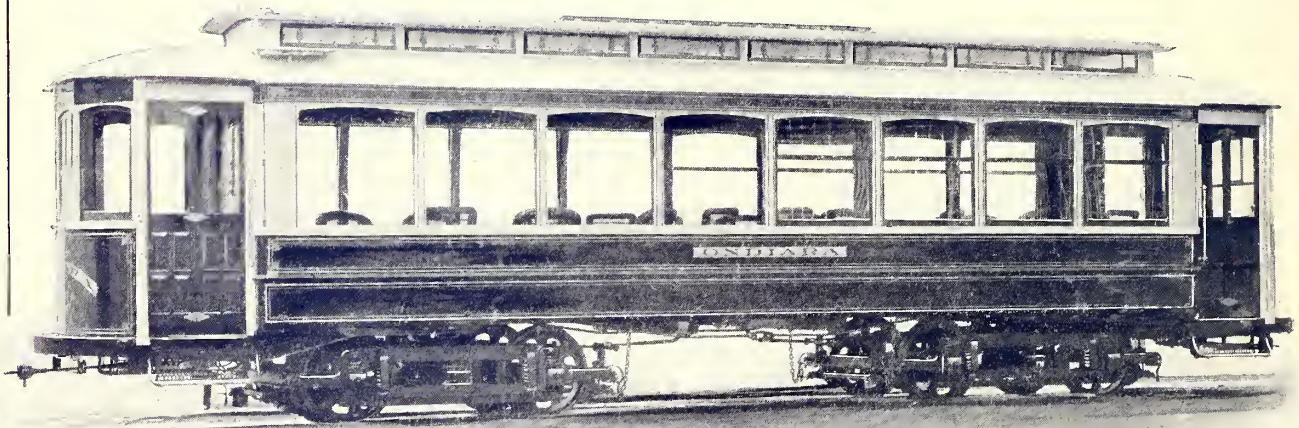
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## A New Semi-Convertible Car

Large Sash. Sides of Great Strength.

Six Inch gain of space inside. No increase of outside width.

Self Contained. Sash out of the way in Roof.



New Semi-Convertible Car for High Speed Interurban Service.

Change from Open to Closed, or the reverse,  
Made in Five Minutes.

Car can be always Suited to the Season.

Storage of sash and panels avoided.

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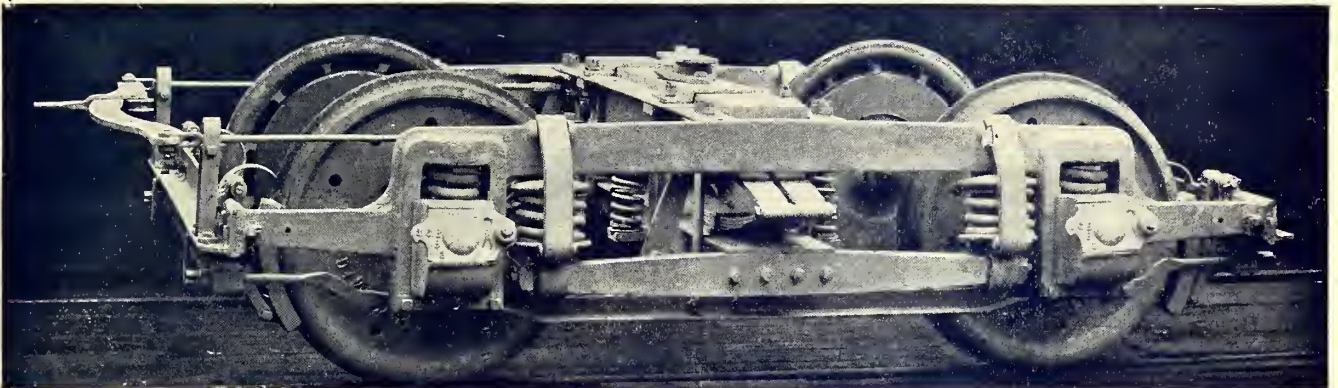
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## Brill System of Trucks for Railways.

### THE No. 27 TRUCK.



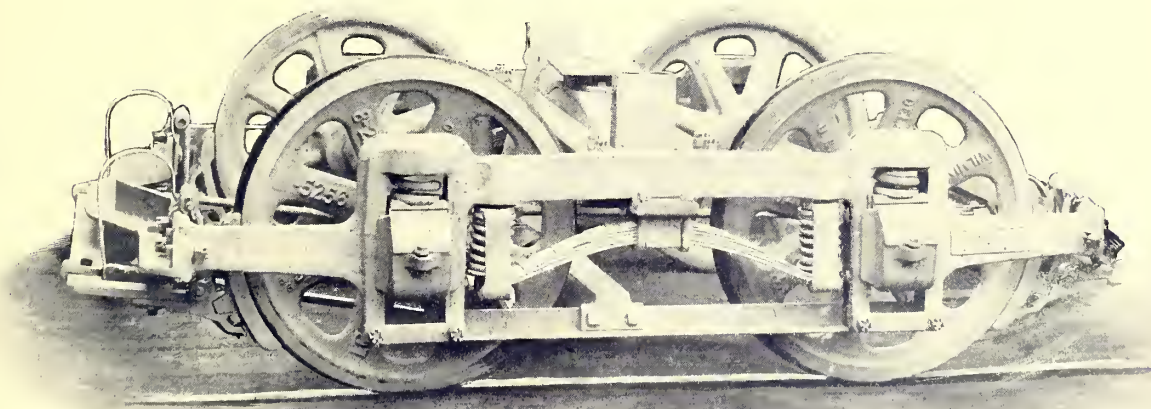
The No. 27 Truck for Fast Heavy Passenger Service.

**THE SAFEST AND EASIEST RIDING TRUCK EVER BUILT.**

**Strong. Steel or Wrought Frame.**

**Three Sets of Springs.**

**Suitable for the Highest Speeds.**



The No. 27-G Truck for Fast City and Suburban Service. A Modification of the No. 27.

**Can be Operated with One or Two Motors.**

**These Trucks do not "kick up" under the most severe action of the Brakes.**

Two Grand Prizes  
at Paris 1900.

One for Brill Con-  
vertible Car. One  
for Brill System of  
Electric Trucks.

# BRILL

## CARS AND TRUCKS

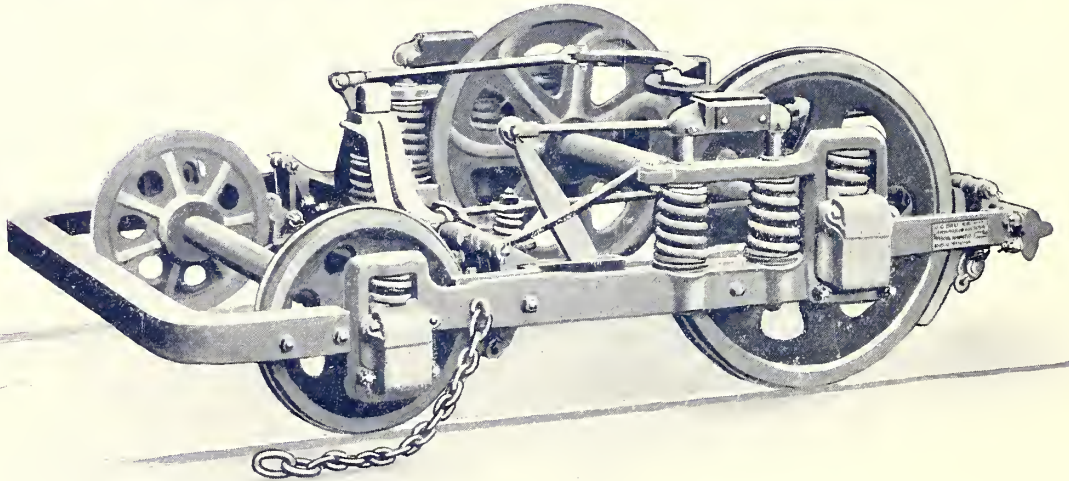
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## "Eureka"

# Maximum Traction Trucks.



The Eureka Maximum Traction Truck.

Ours are the Only Successful Trucks  
of the Type which  
Have yet been Made.

They operate at High Speeds.      Have Ample Tractive Power.      Can Accelerate Rapidly.  
Operate Successfully in Snows.      Can be used under Open Cars as well as Closed.  
Carry the body as low as a 4-wheel truck.  
In a word, they are **THE TRUCK** for Fast Heavy City and Suburban Service.

As we go to press we have an additional order from the Brooklyn Heights Railway for 200  
Eureka Maximum Traction Trucks.

Two Grand Prizes  
at Paris 1900.

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for Brill System of  
Electric Trucks.

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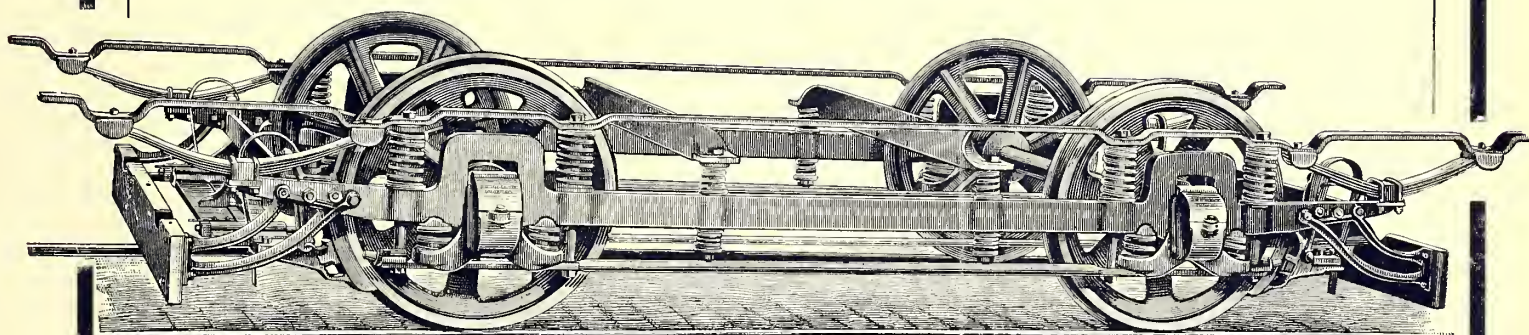
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## Builders of Cars and Trucks

### The 21-E Truck for Four Wheel Cars



The 21-E Truck for Four Wheel Cars.

**Easy Riding. Does not Gallop or Pitch.**

**Carries the Longest Cars Steadily.**

**The Side Frames are Solid Forgings, Stiff, Strong, Durable.**

The Frame is designed along the lines which locomotive builders have found to be the most satisfactory.

The arrangement and combination of springs is one which insures the steadiest and easiest riding.

Two Grand Prizes  
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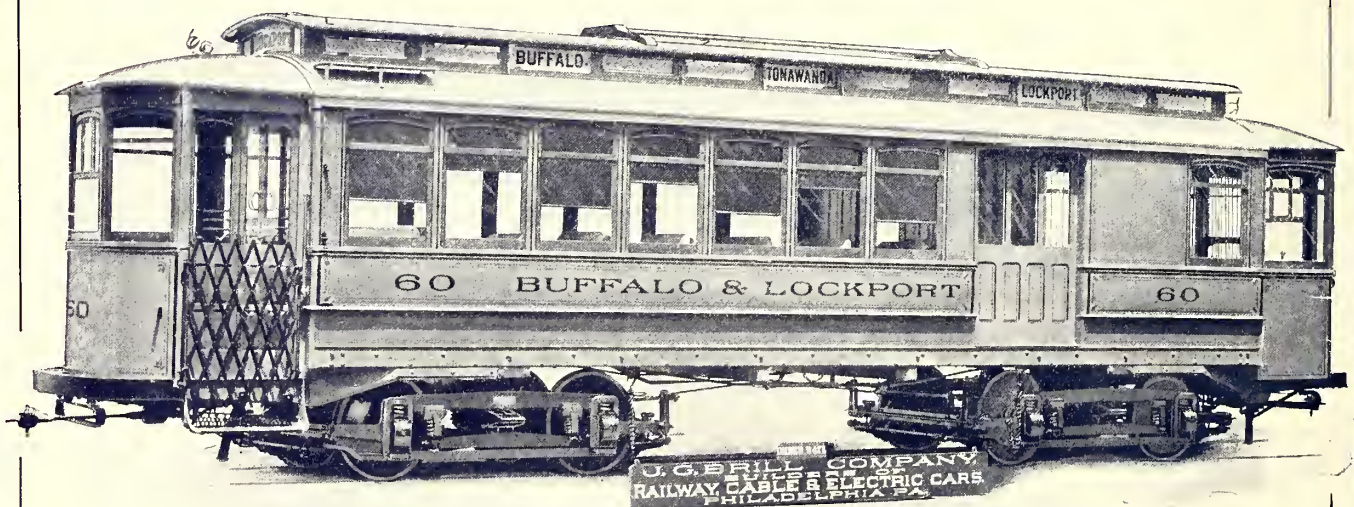
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## Builders of Cars and Trucks

Cars for City Service. Combination Cars.

giving all the conveniences of a steam train in a single car.



Baggage, Passenger and Smoking Car.

California type of Cars. Double Deck Cars.

Open Cars, both single and double truck. Tower Cars. Construction Cars.

Private Cars. Standard Closed Cars. Cars for Elevated Roads.

Snow Plow, Construction Car and Electric Locomotive Combined.

Cars designed for special service to suit the requirements of purchasers.

We build anything that may be needed in the way of rolling  
stock for city, suburban or Elevated Railways.

Two Grand Prizes  
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One for Brill Con-  
vertible Car. One  
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## Cars and Trucks for Electric ...Railways...

Open Cars. Closed Cars. Double Truck Cars.



Car of the Metropolitan Street Railway of New York mounted upon  
Eureka Maximum Traction Trucks.

We have built more than 1000 Double Truck Cars for the Metropolitan Road of  
New York. All are mounted on our Eureka Maximum Traction Trucks.

**We Build Cars Suitable for Every  
Necessary Service**

**DURABLE.**

**STRONG.**

**HANDSOME.**

**COMFORTABLE.**

We can meet special requirements.

Cars for any climate.

Two Grand Prizes  
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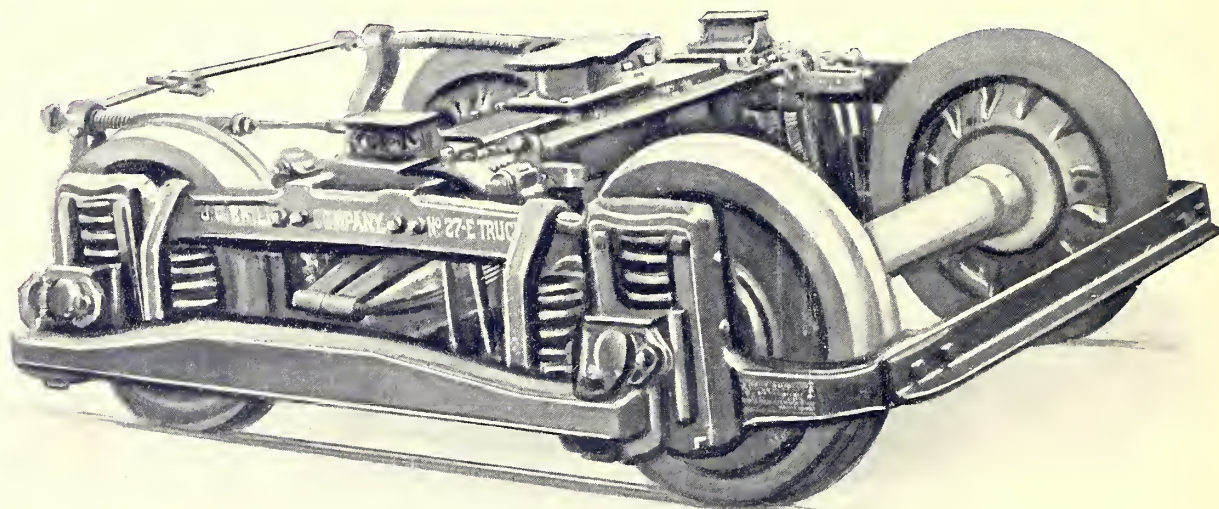
## Trucks for the Highest Speeds

### Our No. 27 Truck.

Safe.

Easy.

Strong.



A High Speed Truck for Third Rail Work.

Our No. 27 Trucks are adapted for use at the very highest speeds attainable on modern railroads. Electric Railway managers have tested them with satisfaction to 70 miles per hour.

No Jerky Motion at any Speed.

The Safest Truck Yet Produced.

Easy for Passengers. Light on Rails.

The Best Truck ever put in service on Railways.

Two Grand Prizes  
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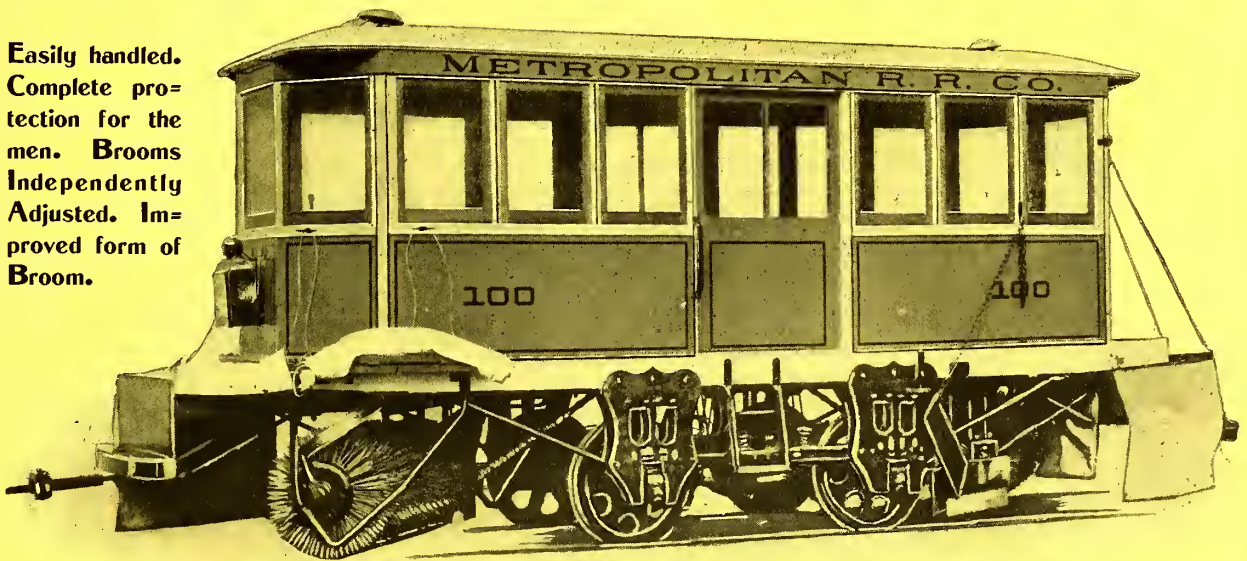
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BUILDERS OF CARS AND TRUCKS.

## Effective Snow Sweepers

Three Motors Employed. Two for propul-  
sion. One for operating brooms.

Easily handled.  
Complete pro-  
tection for the  
men. Brooms  
Independently  
Adjusted. Im-  
proved form of  
Broom.



Sweeper for the Metropolitan Railroad of Washington, D. C.

## TRACK SCRAPERS.

Simple.

Strongly Constructed.

Effective.

Useful at  
any Season.



Removes Sand and Gravel as easily as Snow.



# GENERAL ELECTRIC COMPANY'S Railway Apparatus and Supplies

## FOR THE POWER HOUSE AND SUB-STATION.

Ammeters	Floor Insulators	Repair parts for Generators
Alternating Current Generators, all sizes, belted and direct connected	Friction Tape	Rheostats
Automatic Circuit Breakers	Fuses	Rotary Converters
Cables, all kinds	Ground Detectors	Sockets and Receptacles
Cable Terminals	Insulators	Splicing Gum
Direct Current Generators, all sizes, belted and direct connected	Insulator Racks	Switchboard Panels
Exciter Sets	Instruments of all kinds	Transformers
Expulsion Fuse Boxes	Lamps, Arc, Incandescent	Voltmeters
	Lightning Arresters	Voltmeter Switches
	Oil Switches	Wall Insulators
	Pedestal Switches	Wattmeter, Recording and Indicating
	Potential Plug Receptacle	Wire, Insulated and Bare
	Pilot Lamp Fixtures	

## FOR THE LINE.

Braces	Feeder Ears	Lightning Arresters	Strain Insulators
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Cross Arms	Hauling Clamp for Wire	Soldering Copper	Trolley Wire
Crossings	Insulators	Splicing Sleeves	Turn Buckles
Ears	Lamps, Arc, Incandescent	Strain Ears	
Feeder, Wire and Cable			
Feeder Clamps			

## FOR THE CAR.

Automatic Circuit Breakers	and four motor equipment, with and without Electric Brakes	Lightning Arresters	Sockets
Cable Terminals	Electric Brakes	Motor Switches	Splicing Gum
Car Recording Wattmeters	Friction Tape	Pinions	Steel Gears
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Cleats, Wood, Brass	Fuses	Repair parts for Motors	Third Rail Shoes
Contact Plows	Incandescent Lamps	Resistance Boxes	Tow Car Couplers
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Controllers for single, double			

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