STREET RAILWAY JOURNAL

WEEKLY NEWS ISSUE

SATURDAY, NOVEMBER 24, 1900.

PUBLISHED WEEKLY BY
THE STREET RAILWAY PUBLISHING COMPANY
MAIN OFFICE:
NEW YORK, BEARD BUILDING, 120 LIBERTY STREET.

BRANCH OFFICES:
CHICAGO.....Monadnock Block
PHILADELPHIA.....929 Chestnut Street
LONDON.....Hastings House, Norfolk Street, Strand
Correspondents in other Principal Cities of the World.

Long Distance Telephone, "New York, 4044 Cortlandt."
Cable Address, "Stryjourn, New York."—Lieber's Code used.

TERMS OF SUBSCRIPTION.

In the United States and Canada.....$4.00 per annum
In all Foreign Countries, per annum.....$6.00 / 25/ / 31fr.

Subscriptions payable always in advance, by check (preferred), money order or postal note, to order of C. E. WHITTLESEY, Treasurer.

Entered as second-class matter at the New York Post Office.

EDITORIAL NOTICE.

The news issues of the Street Railway Journal are devoted primarily to the publication of street railway news and current happenings related to street railway interests. All information regarding changes of officers, new equipments, extensions, financial changes and new enterprises will be greatly appreciated for use in its columns.

All matter intended for publication must be received at our office not later than Wednesday morning of each week, in order to secure insertion in the current issue.

Address all communications to

THE STREET RAILWAY PUBLISHING CO.,
120 Liberty Street, New York.

Contents of this Issue

St. Louis Companies Liberal

The St. Louis Transit Company and the St. Louis & Suburban Railroad Company, the only street railway companies in the city, have just made the largest subscription yet received to the local World's Fair fund. The subscription is for $250,000, and makes the closing of the local fund of $5,000,000, a comparatively easy matter.

More Subways in Boston

The next Massachusetts Legislature will have before it two bills providing for a subway in Washington Street, Boston. Both bills will agree upon practically all points except that of ownership. The Boston Elevated Railway still adheres to its desire to own and control the new subway, which shall be built at its own expense. The other bill provides for construction and lease by the city.

The Boom in General Electric

We publish elsewhere in this issue extracts from a recent report of the General Electric Company, covering the seven months succeeding the period covered in the last annual report. The remarkable showing made in this report has been a great surprise to the majority of outside investors, and the stock of the company, scarcely any of which is obtainable, has mounted upward in giant strides.

Another Steam-Electric Conflict

The Maine Central Railroad is now making every effort to have the Railroad Commission decide adversely on the petition of the Lewiston, Winthrop & Augusta Electric Railway Company for permission to construct its proposed new road. It is simply another case of electric competition. The Maine Central, in opposing the grant, raises its familiar protest. The company claims that the State should protect the company's rights, and that the electric railway, if constructed, would virtually parallel the Maine Central tracks and prove a competitor fully as much as would a steam railroad.

Consolidation at Worcester

A special dispatch announces the consolidation of the Worcester Consolidated Street Railway, Worcester & Marlboro Street Railway, Leominster & Clinton Street Railway, and Worcester Suburban Street Railway. The consolidation was effected by the sale of the Worcester Traction Company's holdings of Consolidated Company stock. The Traction Company will go into liquidation. The consolidation will include seven companies with a total capital of $2,129,400. These companies last year carried 22,000,000 passengers, and earned $1,085,000 gross, and $111,663 net. The funded debt of the roads is $1,419,500, floating debt, $796,197. Oliver Ames, Samuel Carr and T. Jefferson Coolidge, Jr., of Boston, will be included among the directors of the new company.

To Build Electric Lines in Cuba

At a meeting of Canadian and American capitalists, held in Philadelphia, Nov. 8, the Cuba Development Company was organized with a capital of $20,000,000. It is announced that the purpose of the company is to secure control of electric light and railway franchises in Cuba, and to establish electric plants and railway systems in the principal cities. The enterprise owes its inception to Sir William C. Van Horne, of Montreal, and he, together with his son, R. B. Van Horne, of Montreal, has sailed for Santiago, Cuba, in the interest of the company. Among the most prominent Americans said to be interested in the company are: William L. Elkins, P. B. Widener, Thomas Dolan, George D. McCreary and J. J. Sullivan, of Philadelphia; R. A. C. Smith, president of the Cuba Mail Steamship Company, of New York, and Percival Farquhar, of New York.

Regular Meeting of the New England Street Railway Club

The next regular meeting of the New England Street Railway Club will be held at the Pathfinder Meeting Rooms, 67 Federal Street, Boston, on Wednesday evening, Nov. 28.

The previous meetings of the club have been chronicled in the STREET RAILWAY JOURNAL, and the papers read and discussions cannot help but be of great value to the street railway officials. The membership of the club now numbers eighty-five, although it has had but three meetings.

"Accidents" will be discussed at the next meeting of the club, and Charles S. Baxter, attorney for the Boston Elevated Railway Company, will open the discussion. Mr. Baxter is a graduate of the Harvard Law School, and has been connected with the legal department of the West End Street Railway and the Boston Elevated Railway since his graduation, or about twelve years.

"Trucks" will also be discussed, but no assignment has been made on this subject.

Proposed Separate Car Legislation in Georgia

There is much discussion throughout the State of Georgia regarding the separation of the whites and blacks in the street cars, and the Macon grand jury has prepared a memorial to their representatives in the Legislature recommending that they introduce and endeavor to have enacted a law requiring all dummy, electric and street railways to provide separate or compartment cars for the white and negro passengers, so as to prevent the commingling of the races and to provide for the indictment and punishment of the president and general manager, or officers in charge, of such railways violating this law, as well as the employees of such railways in charge of the cars in which such violations occur.

Freight Service for Providence

The Union Railroad Company, of Providence, R. I., has secured the services of a man who has had a long experience in freight traffic to look over the territory occupied by its lines and the lines of the Rhode Island Suburban Railway Company, and submit a general scheme for connecting manufacturing plants and business houses with the steam road and steamship wharves. The company has been in consultation with the principal manufacturers of the city, and the universal opinion is that the electric locomotive should supersede the horse.

Shippers have been asked to give an approximte estimate of the number of tons handled, and to say what proportion goes by rail and boat. This will enable the company to determine about the number of freight cars needed. The idea is to have one car do the work of six two-horse wagons. The company has invited suggestions and opinions from all interested.

The Populations of Cities

The populations of some of the principal cities of the United States for 1900 are given herewith, as disclosed by the census. Comparisons are made with records of 1890, and the total increase and increase per cent are given in every case:

	1900	1890	Increase	Per Cent
New York	3,437,202	2,492,591	944,611	37.90
Chicago	1,698,575	1,099,850	598,725	54.43
Philadelphia	1,293,697	1,046,964	246,733	23.57
St. Louis	575,238	451,770	123,468	27.33
Boston	560,892	448,477	112,415	25.06
Baltimore	508,957	434,439	74,518	17.15
Cleveland	381,768	261,353	120,415	46.07
Buffalo	352,219	255,664	96,555	37.77
San Francisco	342,782	298,997	43,785	14.51
Cincinnati	325,902	296,908	28,994	9.77
Pittsburgh	321,616	238,617	82,999	34.78
New Orleans	287,104	242,039	45,065	18.62
Detroit	285,704	205,878	79,828	38.77
Milwaukee	285,315	204,468	80,847	39.53
District of Columbia (including Washington)	278,718	230,392	48,326	20.98
Newark	246,070	181,830	62,240	35.33
Jersey City	206,433	163,003	43,430	26.64
Louisville	204,731	161,129	43,602	27.06
Minneapolis	202,718	164,738	37,780	23.05
Providence	175,597	132,146	43,451	23.88
Indianapolis	169,164	105,436	63,728	60.44
Kansas City, Mo.	163,752	132,716	31,036	23.39
St. Paul	163,632	133,156	30,478	22.89
Rochester	162,435	133,896	28,539	21.31
Denver	133,859	106,713	27,146	25.44
Toledo	131,822	81,434	50,388	81.88
Allegheny	129,896	105,287	24,609	23.37
Columbus	125,560	88,150	37,410	42.44
Syracuse, N. Y.	108,374	88,143	20,231	22.95
Omaha	102,555	140,452	*37,897	*26.98

*Decrease.

New York Meeting of the A. S. M. E.

The forty-second meeting of the American Society of Mechanical Engineers will be held in New York, Dec. 4-7. The meeting will be opened at 9 p. m., Dec. 4, at the society's parlors, and the president will deliver his annual address. On Wednesday, Dec. 5, the society will hold three sessions, morning, afternoon and evening. The morning session will be devoted to business, after which the following papers will be presented: "Comparison of Rules for Calculating the Strength of Steam Boilers," by H. de B. Parsons; "A Record of the Early Period of High-Speed Engineering," by Charles T. Porter; "Steam Engine of Maximum Simplicity and Highest Thermal Efficiency," by Robert H. Thurston.

The afternoon will be devoted to renewing old acquaintances and general social intercourse. The evening session will be devoted to the presentation of the following papers: "Note on Centrifugal Fans for Cupolas and Forges," by William Sangster; "Power Plant of the Massachusetts General Hospital," by F. W. Dean; "The Construction of Contracts," by R. P. Bolton; "An American Central Valve Engine," by E. T. Adams. On Thursday the society will be the guest of Columbia University. President Low, of the university, will receive the members, and luncheon will be served in the engineering building. After luncheon the mechanical laboratories will be inspected, and the locomotive Columbia, as well as the Allis experimental engine, will be inspected. The entire university plant will be thrown open to the visitors. Four papers will be presented at the morning session on Thursday, and in the evening the members will be tendered a reception by the president and president-elect. The closing session will be held on Friday morning, when five papers will be presented.

Municipal Ownership in Chicago

The following most interesting editorial appeared in the *Chicago Chronicle* of recent date, relative to the proposed municipalization of the local electric railway lines:

"As far as Illinois and Chicago are concerned, there is nothing practical in the discussion regarding public ownership of street railways, gas plants or other public utilities. Under the present constitution the State cannot loan its credit nor raise a tax for any work of public improvement without a vote of the people. The people never will vote for such a measure.

"As to Chicago, municipal ownership is equally impracticable. The city cannot contract a debt which would be necessary if its power was to be exercised for the purchase or construction of street railways or gas plants or any other public work of general utility. There is an impassable stone wall in the way of any project by which the State of Illinois or the city of Chicago might become proprietor of railways or supplant existing corporations of any kind, private, quasi-public or public. Neither the State nor the city has the money or can obtain the money necessary for the purpose.

"If it was practicable for the city of Chicago to own and operate the street railways and other public utilities it would be inexpedient. Unless a thorough civil service system was established—better as a system and better administered than any national, State or city civil service now in existence—the administration of the public utilities would be pervaded by extravagance, by favoritism, by the worst evils of the spoils system, by inefficiency, probably by corruption.

"We can imagine the riot which would occur in the appointment of all the officers and employees in the street railways, for instance. Not fewer than 18,000 or 20,000 voters are in the service of the present street railway corporations. If all these men held merely political places they would rule the elections in the city and in Cook County. They might rule the State.

'The favoritism which might be practiced if the city should build and operate street railways would be appalling. Lines would be constructed in all directions to 'develop' property or to serve private interests in other ways. Cars would be run on time tables arranged for private accommodation. The street car system would be used for party, personal and private ends, not for public ends.

"These are practical considerations, entirely disconnected from a discussion of the socialistic principles on which the theory of municipal ownership is founded. They are conclusive against all schemes of municipal ownership under our constitution and laws. The people are opposed to revolution."

The Success of the General Electric Company

An interesting example of the present abounding prosperity is furnished by the condition of the General Electric Company. The stock of this company has recently increased as much as 5½ points in one day, but this has been due to a perfectly healthy rise in its value, and not to manipulation by speculative interests. It has been greatly accentuated by the fact that but little stock is to be had in the open market, and that the activity has been confined to small orders. The public has but recently taken an interest in the affairs of this company, remembering only the conditions existing a few years ago, when it was engaged with a deficit, so that there is at present a widespread demand from outside sources for all the stock that can be obtained, owing to the general awakening to its true value.

The attention the stock has been receiving on the New York Stock Exchange, and the surprise of the people who have begun to realize the profitable course of its business during the last few years, have been largely due to the report of its condition made by the company in connection with its application for the listing of $4,415,000 of additional common stock, which is to be used in the taking up of the outstanding debenture bonds. The report to the governors of the Stock Exchange shows on a seven months' basis (the period covered by the report) that the company has an earning capacity of something like 30 per cent per annum. The report is for the period subsequent to that covered in the company's last annual report, or from Feb. 1 to Aug. 31 of the current year. The October dividend of the company was at the rate of 8 per cent, but prior to that the dividend had been 6 per cent. It appears that the present dividend might have been paid in any year of the last five years, and that the company is earning now about four times the present dividend rate.

The profit and loss account for the seven months referred to is as follows:

Sales of goods	$14,803,383.83
Expenses	11,810,999.86
Profit	$2,992,383.97
Royalties, etc.	492,590.00
Total profit	$3,484,973.97
Interest, preferred dividend, etc	264,995.36
Surplus	$3,219,978.61
Paid on common six months (3 per cent)	548,280.00
Balance (equal 14.6 per cent)	$2,671,698.61

In other words, the company earned on the common stock in seven months 17.6 per cent, equal to a trifle over 30 per cent per annum. The sales of the company last year mounted to $22,379,463. At the rate of sales for the seven months of this year the total sales for the year will be something like $25,223,000.

Its position on Aug. 31 as to assets and liabilities shows:

Capital assets:		
Plant and factories		$3,896,748.05
Patents and goodwill		2,000,000.00
Securities and real estate		7,119,937.40
Total capital assets		$13,016,685.45
Deduct preferred stock	$2,551,200	
Debenture bonds	5,298,000	7,849,200.00
Balance capital assets		$5,167,485.45
Current assets:		
Cash		$2,310,314.74
Notes and accounts		7,379,836.46
Work in progress		1,527,337.86
Inventories		7,788,893.56
Total capital and current assets		$24,173,868.07
Deduct accounts payable		873,138.94
Net capital and current assets		$23,300,729.13
Common stock		18,276,000.00
Profit and loss surplus		$5,024,729.13

Electric Traction on Steam Roads*

The Société Italienne des Chemins de fer Méridionaux, which operates the Italian government steam railroads in the Department of the Adriatic, has devoted considerable attention to the use of electric power on its lines, one special reason being the fact that throughout the territory traversed by its system there is a large number of water powers, and it was hoped that these could be utilized for use on some of its feeder lines through the employment of electricity. The electric traction experiments made by the company have been of two kinds. For certain lines where the traffic was considerable and the train service sufficiently frequent, the company has adopted the direct distribution system by means of a central station and overhead lines. For other lines, where the traffic was quite small, but where it was thought that travel might be increased by a more frequent service, a number of accumulator cars has been run. Experiments have been carried out not only to determine the value of motive power, but also whether by means of it, or at the same time, the company could make a reduction in its train force and station attendants. The system of direct distribution from a central station will first be considered.

DISTRIBUTION FROM A CENTRAL STATION

This is soon to be in use on the Lecco-Sondrio-Chiavenna division, a single track line which has a length of 109 km. The maximum grade on this line is 2.2 per cent. The minimum curve radius is 300 m, and there is a large number of tunnels. The traffic is considerable throughout the year, as the region traversed is essentially an industrial one. The line is operated entirely by electricity.

The passenger trains will be drawn by a 300-hp motor car, which has a weight of about 50 tons, and is capable of carrying sixty passengers, as well as carrying 2 tons of baggage and of drawing four ordinary cars at a speed of 60 km an hour on grades of 1 per cent. For grades higher than this the speed is 30 km per hour. The freight trains will employ a 600-hp electric locomotive, with a draw-bar pull of 250 tons, and having a maximum speed on grades of 1 per cent of 30 km per hour.

The electrical installation is being made by Ganz & Company, of Buda-Pest, and three-phase current will be used for distribution and by the motors The power station is at Morbegno, and is operated by water power. There are ten sub-stations, which receive current from the main station at 20,000 volts. The transmission line consists of three conductors with a diameter of 7 mm. At the sub-stations the voltage is reduced to 3000 volts by transformers, at which pressure it is distributed to the motors along the line by two wires of 8 mm diameter, the third conductor being formed by the rails. Two trolley wires are suspended 6 m above the rails, except in the tunnels, where they are lowered to a height of 4.50 m above the rails. They are supported in turn by the steel span wires, which are attached to poles or eye-bolts anchored in the masonry, with a second insulation of porcelain in the span wire. Wooden poles are used in the open line.

The power station contains four 2000-hp units, alternators being direct-connected to the turbines. The former supply current at 15 cycles. The head of water is 30 m.

The trolley used on the car is of a special form, and consists of a light metal frame work, carrying on its upper part two rolling contacts. The pole is kept pressed against the overhead wire by a double system of springs, which is controlled by pneumatic means from the motorman's cab. The air pressure is supplied by a Westinghouse air pump. The current at 3000 volts is taken directly to the motors, the rotors of which are provided with liquid rheostats. Each car is fitted with four motors and a series-parallel controller, capable of connecting the motors either two in series or all in parallel. Under the former conditions the speed is 30 km, and under the latter 60 km per hour. To avoid any possibility of the introduction of a high potential in the car, the motors are metallically encased, and this case is grounded. The system, as described, has been employed at Buda-Pest on a line 1600 m in length during December, 1899, and will be put in operation on the Lecco-Sondrio-Chiavenna line during the spring of 1901. The generators have been supplied by Schuckert & Company, of Nuremburg. The rest of the work is being done by Ganz & Company.

THE ACCUMULATOR LINE

The line to be equipped with accumulators is that between Bologna and St. Feliee, and has a length of 84 km going and returning, with a maximum grade of 0.6 per cent. The freight traffic is carried on by steam locomotives, as there is only sufficient freight for the operation of one train per day. The transportation of passengers and baggage is effected by four motor cars. Each car seats sixty passengers, and weighs 45 tons when loaded. The battery charge is sufficient to run the cars 100 km. Each car is equipped with two Ganz 50-hp motors. The type of accumulator used is the Peseetto. Each car carries 280 cells, each composed of eight positive and nine negative plates. The weight of each cell is 24 kg, and its capacity is 148 amp. hours. The batteries are in groups of three, which can be used in series or in parallel. When in series the speed of the cars is 45 km per hour, and when in parallel 75 km. The cars are equipped with Westinghouse air brakes.

* Paper read at the International Railroad Congress, Paris, September, 1900.

The Taxation of Street Railway Franchises*

BY TIMOTHY S. WILLIAMS, VICE-PRESIDENT OF BROOKLYN RAPID TRANSIT COMPANY

I am glad of the opportunity which the invitation of your club affords me to speak upon the subject of taxation from the point of view of a corporation enjoying numerous and valuable public franchises. The Brooklyn Rapid Transit Company is the largest taxpayer in the Borough of Brooklyn, and with three or four exceptions the largest taxpayer in the entire Greater New York. It, therefore, has a very live interest not only in the expenditure of public money, but in the proportion of that expense which it pays. The company's policy and practice is to bear cheerfully and to pay promptly all taxes lawfully assessed against it, but to resist those which it believes are illegal, excessive and inequitable. It is a matter of no small gratification to the company's present officers that in the five years of their connection with the company not a single tax has thus far been resisted which the courts have not subsequently set aside or reduced in vindication of the company's action.

Taxes upon corporations are of so many kinds that few persons have any appreciable idea of their aggregate amount. The Brooklyn Rapid Transit Company paid last year in direct taxes to city and State $737,000, and in indirect taxes to the city as part of the burdens imposed upon its franchises an additional sum of $305,000, a total amount of $1,042,000. This was nearly 10 per cent of its gross earnings, and it was nearly three times the amount of the year's profits. For every dollar placed to the credit of the company's stockholders $3 went to the credit of the city and State. Nearly $2,900 a day had to be set aside for the expense of government! The average profit per cash passenger after paying operating expenses and interest on cost was only six-tenths of 1 cent, and it, therefore, required the carrying of 483,000 cash passengers every day in the year in order to yield profit enough to pay the company's taxes.

NO FICTITIOUS CAPITALIZATION

But lest somebody may criticize that these figures are large because of the great proportion of expense which goes to pay interest on what is called fictitious capitalization, I will answer that even if there was no interest to pay whatever—if tracks and franchises and power houses and cars and real estate were all created for us by some good fairy and entailed not a single coupon or a guaranteed dividend check—still it would be necessary for us to carry 145,000 cash passengers every day in the year to give us money for our taxes. But no fairies are making free presents of such properties, and that part of our expense which represents interest on cost of properties is as legitimate as the employees' wages, and to-day you could not duplicate the properties for many millions more than the par value of the stocks and bonds whose interest swells the cost of carrying passengers. That capitalization represents investments extending over forty-seven years; and yet, at the end of the forty-seventh year, out of an enterprise which has been the foremost factor in Brooklyn's growth, and whose development has added hundreds of millions to the values of city and suburban property, for every $3.62 which was earned for the investors (stockholders and bondholders representing forty-seven years' capitalization) one dollar was earned and set aside for city and State treasuries.

From these figures you will see that instead of the people complaining, as we occasionally hear them, that the company is instituting economies in the operation of its railway in order to pay dividends on so-called "watered stock," they might better complain that we are obliged to reduce unprofitable car service in order to have money enough left to pay our taxes. If the city and State would relieve us from the burden of paying taxes and would share with us the cost of new improvements and extensions, I think our stockholders would be quite willing to divide with them equally all the net profits of operation. The fact is that all the net earnings of last year, after paying operating expenses and taxes, were less than 6 per cent of the total cash invested in the properties from their origin to the present time, and those who talk about "watered" stock do not tell what is the truth—namely, that every outstanding bond on our entire system represents its par value in property, and every share in Brooklyn Rapid Transit stock has behind it in actual cash investment considerably more than its present market price.

SOME THINGS THE PEOPLE FORGET

Increase in corporate capitalization excites attention and frequently adverse criticism, but decapitalization passes unnoticed. People note the great prosperity of a few exceptionally favored transportation lines, and deduce extravagant generalizations from the experiences of these few; but they forget or overlook the very much larger mileage of tracks into sparsely settled districts, the competition for sufficient revenue to pay operating expenses, taxes and interest, the foreclosures and reorganizations, sometimes the selling for non-payment of taxes, the assessments of stock and bondholders, the reductions of interest charges, and finally the absorption and support of the weaker by the stronger companies. It has been this process of decapitalization which has finally brought substantially all of the railroad properties of Brooklyn under a single management. The latest efforts at reorganization just before acquisition by the Brooklyn Rapid Transit Company reduced the bonded indebtedness over $5,000,000, and the annual fixed charges over $600,000, and the $25,000,000 of added Brooklyn Rapid Transit stock took the place of nearly $40,000,000 of stock of the absorbed companies. The consolidation of properties was a business risk, inspired by the hope that with reduced fixed charges and with the economies which were expected from joint operation the combined properties could yield profits instead of losses, and, by multiplication of facilities, still further expand the growth of the city. The very first result of these reduced charges and economics has been that railroads which for years had failed to pay their taxes are now contributing largely toward the expenses of State and city government. The first, and as yet the only, beneficiary of our economies, therefore, has been the city treasury.

Tax reform is too often an attempt to shift burdens from one set of shoulders to another or to furnish revenues for extravagant officeholders to spend, and inasmuch as all taxation is unpopular in proportion to the number of people it affects, the tendency of the legislative mind is to restrict new taxation to as narrow a field as possible. Consequently, instead of assessing property uniformly and equally, legislators have devised special burdens for the unfavored few, until to-day the dead, the bibblers and the corporations pay substantially all the State expenditures, and if the latest effort at tax reform is successful the corporations alone will pay a very large proportion of the cost of city government. The dead cannot cry out in protest, the bibblers are ashamed to, and the corporations are too often afraid that protests will only bring fresh burdens in the shape of official oppression or political blackmail.

HEAVY SPECIAL BURDENS

These spasmodic and one-sided attempts to divide and distribute the cost of government have fallen with particular weight on corporations enjoying public franchises, and their results on street railway companies are well illustrated by the obligations, direct and indirect, which are now borne by the Brooklyn companies. In the first place, so far as real and personal property are concerned, we are in the same category and on the same level with all other taxpayers, with this exception—that the tax assessor can always find and locate our personal property—cars and motors and trucks and tools and supplies—but he very seldom finds and assesses the personal property of individuals. We pay each year on our power houses, our car houses, our lands, our tracks, our elevated structures and all our other kinds of real property over $330,000 a year. Thus far we are on an equal plane with other property owners. Beyond that our payments are special burdens —imposed because we are corporations and because we occupy public streets. These special burdens began in 1853, when we were charged with certain paving obligations, and a license fee for every car operated, and although that car license fee was declared to be "in full satisfaction for the use of streets," and although we believe this declaration, confirmed as it afterward was by legislative act, constitutes a contract which, if insisted upon, would relieve us from many later purely franchise taxes, we have borne without active complaint each additional burden until the latest crowning imposition contained in the so-called franchise tax of 1899 has forced us to cry out in protest and to appeal on grounds of law and equity to the courts and to the people.

Without considering the effect of the new franchise tax at all, we are paying directly and indirectly over $700,000 a year in what are purely franchise taxes. There are two kinds of franchise taxes —one the tax which a company pays for the privilege of being a corporation, and the other the tax which it pays for its occupation of public streets and places; but the Legislature had confused the two long prior to the adoption of the new franchise tax law. Otherwise it would have treated all corporations alike. Charters are largely free; no special legislative acts are longer required; any set of men can get together, and upon complying with certain formalities and paying the incorporation fee become a corporation. But the Legislature has said that certain kinds of corporations enjoying public franchises, like gas and electric and street railway companies, shall pay a much larger tax for

* Paper read before the Municipal Club, of Brooklyn, Oct. 23, 1900.

the privilege of doing business under a corporate name than other kinds of corporations, and there is absolutely no justification for this discrimination except upon the theory that the tax is based upon the occupation of public streets and places. For this privilege, therefore, our companies paid to the State last year over $200,000. We paid to the city for the privilege of carrying the people across the Brooklyn Bridge without extra fare, $170,000. We paid in car licenses and percentages to the city over $30,000. And we paid in paving and repairing city streets, in removing snow and ice, in lighting certain streets and public places, and in free transportation of policemen and firemen, over $300,000. All these are franchise taxes, and to impose fresh ones, more than half as large as all the others combined, is a tyrannical exercise of the taxing power, which, if applied to individuals generally, would cause a popular revolution, but if applied and enforced against corporations, will mean for some of them bankruptcy, and for others restriction of improvements, curtailment of facilities, possible reductions in wages and much lessened profits.

THE BEST FORM OF COMPENSATION

But this question of taxing public utilities is much larger than any question of the dollars and cents which go into city or State treasuries. It is a business question, and should be determined by business considerations. Individuals or corporations which receive valuable privileges from a city should make ample compensation, but the nature of that compensation is a problem of statesmanship, of foresight, of municipal benefit, of practical business judgment.

Three general courses lie open as original propositions:

(1) The municipality may remove all obstacles to private initiative and enterprise, and grant franchises in perpetuity under reasonable, but not necessarily contractual, limitations as to rates of fare, car service and taxation; or

(2) It may create and operate at public expense all transportation lines; or

(3) It may reserve the ownership of, or the right to acquire the tracks and franchises, and lease for limited periods and upon conditions which may be agreed upon, the operation of cars to a corporation created for that purpose.

I am frank to admit, considering the tendency of legislation and the increasing public demands, that the third course as an original proposition is the best from the selfish point of view of the corporation. Then the contract between city and corporation would clearly define the powers and rights of each. There would then be no legislative or political attacks, no freshly recurrent tax bills to stimulate economies and frighten stockholders, no sense of obligation on the part of the corporation beyond the terms of its contract, a plain business proposition to make the most money possible during the term of the lease. But from the city's point of view, as an initial proposition, such a course would be fatal to municipal progress and development. It is only to be commended when a city has attained its principal growth, and then with reservations depending upon the particular conditions and the objects to be attained.

PRIVATE ENTERPRISE VS. MUNICIPAL

As between the choice of private construction and operation and municipal construction and operation, assuming for the sake of argument what is not true, in this country at least, namely, that governmental activities are as honestly and economically administered as are private activities, the facts of experience speak more loudly than the words of theory. The transportation conditions of European cities have only to be compared with those of American cities to illustrate in a general way the results of municipal enterprise on the one side and those of private enterprise on the other. Neither in mileage of track to population, in motive power, in equipment, nor in rates of fare for equal distances, do the transportation facilities of European cities anywhere nearly approach those of the foremost American cities. In much-heralded Glasgow, with a population of 800,000, there are only 73 miles of tracks, and the fare is 6 cents for a distance not greater than 6 miles. In Berlin, with a population of nearly 2,000,000, there are only 260 miles of track, and the maximum fare is 7½ cents. In Paris, with a population of 2,500,000, there are only 206 miles of track, and the maximum fare is 8 cents. In London, with a population of 4,500,000, there are only 245 miles of track. And in all these cities the operation of the minimum rate of fare with increased rates for longer distances has congested the population, prevented the territorial growth of the cities, and imposed a higher average rate for the distance than is charged in America, although the wages paid to employees here are considerably higher and the cost of operation thereby greatly enhanced. In Brooklyn, on the other hand, with 1,200,000 people, there are over 500 miles of track, and the longest distance for 5 cents is nearly four times the distance which one can be carried for the same money in any European city.

THE CITY NOT A MODEST PARTNER

I think anybody who has watched the growth of Brooklyn will agree with me that compensation for railway franchises has by no means been limited to the moneys which the corporations have paid into official treasuries. I have shown that for every $3.62 which went to the credit of bondholders and stockholders last year out of the profits of the business $1 went to the credit of city and State. But if I were to point out to you the amount of increased taxes which have each year during the last forty-seven years gone into the city treasury by reason of the increased taxable valuations which have followed the extension of our railways and the voluntary reduction of fare, the savings to the people by the reductions in cost and time of service, and the distribution of millions of dollars every year for wages and supplies, you would agree with me that the city has not been by any means a modest partner in our enterprise—but that for every dollar of profit which has been taken out of all the railways of Brooklyn from their beginning to the present day, the city and its people have received tenfold dollars and more. I had the curiosity to verify one phase of this partnership interest when the franchise tax bill was pending in the Legislature, and for sake of illustration I took from the assessment rolls the valuation for the year 1895 (the year prior to the opening of our Fifth Avenue extension from Thirty-Ninth to Eighty-Sixth Streets) on either side the avenue, computed the tax on this valuation, and then compared both valuation and tax with the valuation and tax for 1899, four years after the line had been in operation, and I found that for every dollar which the company's investment had earned $4 had gone into the city's treasury from the increased valuation.

$2,700,000 SAVED EVERY YEAR TO THE PEOPLE BY THE BRIDGE SERVICE

Another illustration which is still fresh in your memories and which must come home to you every day is the extension of our lines across the Brooklyn Bridge. For that privilege we not only paid to the city treasury, in hard-earned cash, last year, $170,000, but, with an added expense of operation represented by running cars 7000 miles a day more without additional fare, we are saving to the 300,000 persons who daily cross the bridge 2½ cents each, or over $2,700,000 every year, and this after private operation supplanted municipal. But even that is not the full benefit. Ask the real estate men of Brooklyn what has stimulated their business during the last three years, what has trebled and quadrupled the values of suburban lands, what has turned farms into city lots, and increased tremendously the population of the city, and they will tell you that the primary factor in these results has been the extension of trolley lines across the bridge and the cheapened rate of fare which gave Brooklyn her advantage in its competition for householders with upper Manhattan, the Bronx, Jersey and Staten Island. What is the annual tax of $170,000 paid into the city treasury compared with the $2,700,000 a year directly saved to the people of Brooklyn and the millions more which have been added to the value of their property? Well could the city afford to abolish the bridge tax altogether, and to pay a handsome bonus every year to the railways than to have its people deprived of such substantial and far-reaching benefits.

The corporation which I represent is proud to have been so potent a factor in Brooklyn's development, and it never wants to shirk its responsibility for encouraging and continuing Brooklyn's prosperity. But it submits in fairness that Brooklyn is equally interested in and should be equally solicitous for the railway's development and prosperity. You cannot, if you would, and you would not if you could, destroy the partnership which binds our interests with common ties. The relations of corporation to city are reciprocal. You cannot impose hardships and burdens on us without some injury to yourselves. We cannot injure your interests and welfare without injuring our own. We are no suppliants for public favor not deserved—we ask nothing except fair treatment. We are here to build up a legitimate business enterprise, in whose success the city has been in the past, and always will be, the chief participant, and as the city's largest taxpayer, and one of its chief instrumentalities for the city's material good, we ask and have a right to ask the enlightened and liberal co-operation of both its government and its people.

At the solicitation of J. I. Beggs, general manager of the Milwaukee Electric Railway & Light Company, C. W. Wetmore and George R. Sheldon, of New York, directors of the company, recently made an inspection of the company's property. Under the new franchise grant, the company is to make a number of improvements in the property, and Messrs. Wetmore and Sheldon were acquainted with the new work proposed. Mr. Beggs announces that the Racine power house is to be enlarged, and, in fact, virtually rebuilt, owing to increased business. Plans are now being drawn for this improvement.

Electric Traction on the Italian Mediterranean Railroad

The Società Italiana per le Strade Ferrate del Mediterraneo, which operates the two large systems of the Italian Government railways, including that of the northern part of Italy, has recently been making some electric traction experiments. The lines equipped are near Milan, and consist of a main line from Milan to Gallarate, which has a length of 40.3 km of double track with a maximum grade of 0.6 per cent, and an average grade of

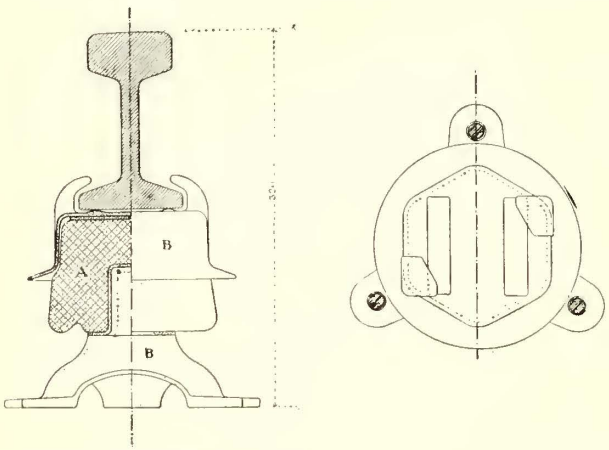


FIG. 1.—SECTION AND PLAN OF THIRD-RAIL INSULATOR

0.2 per cent, and three single track branch lines from Gallarate, having a length of 26 km, 31 km and 33 km respectively. The grades on these branch lines vary from 0.8 per cent to 2 per cent. Electric traction was introduced on these lines in 1898, and has resulted in a large increase of traffic, owing to the greater frequency of the trains. The most desirable train has been found to consist of two long double-truck cars, one a motor car, the other a trail car. The motor car is equipped so as to be able to attain a speed of 90 km per hour on the 0.2 per cent grade. During the season of light traffic and on the branches, motor cars are used without trailers. The train service is as follows: Every hour a train is run between Milan and Gallarate, stopping at all way stations. Twenty minutes after the departure of the way train, a second train is sent out, stopping at only a few of the stations. Fifteen minutes after this train an express train is started out, which stops only at Gallarate, and then continues on one of the branch lines, stopping at all stations. Ten minutes afterward a second express train is sent out, going through Gallarate without stop, and then taking one of the other branch lines. Ten minutes afterward a third express is sent out, which goes out on the third branch line. Passengers from intermediate stations between Milan and Gallarate for any one of the branch lines can take either of the first two trains and change at the latter station for the branch lines. During the year the total number of axle kilometers run on the system was 19,898,340.

ELECTRICAL INSTALLATION

After a study of the different systems of distribution, it was decided to adopt the alternating current of distribution with continuous current motors and the third rail.

The power station is at Tornavento, which is 11 miles from Gallarate, and is operated by water power for the greater part of the year. It contains eight turbines and three compound condensing engines, each directly connected to a 750-kw three-phase generator. There are also two exciters. The generation and distribution is at 12,000 volts, which, at the sub-stations, is reduced to 650-volt direct current by rotary converters. The transmission line between Tornavento and Gallarate is supported on wooden poles with porcelain insulators. Six bare copper wires, each with a diameter of 7.8 mm are employed. The maximum drop on the distribution system is 8 per cent. The insulators are tested to a potential of 40,000 volts. For most of the distance the transmission line is carried alongside of the track, which is on its own right of way. The Wirt lightning arresters are used. The frequency is 25 cycles per second.

The transformers are of the G. E. air-blast type of 180 kw each. Their efficiency is as follows: With full non-inductive load, 97 per cent; with three-fourths inductive load, 96.6 per cent; with one-half non-inductive load, 95.8 per cent; with one-fourth non-inductive load, 92.8 per cent. The transformers are capable of carrying an overload of 25 per cent for one-half hour and 40 per cent for several seconds. The rotary converters are of 500 and 200 kw each.

THE TRACK

The third rail is a 45-kg (91 lbs.) T, as shown in Figs. 1 and 2, and rolled in 12-m (39-ft.) sections. It is held in an iron clamp supported on a composition insulator, which, in turn, is supported on a cast-iron chair. The rail-joints are connected by a single fish-plate with a flexible copper bond with Chicago terminals. The third rail is fed every 100 m (328 ft.) The third rail is carried outside the service rail at a distance of about 675 mm (3 ft. 2½ ins.). The rails are bonded for the return by the same type of bond as in the third rail.

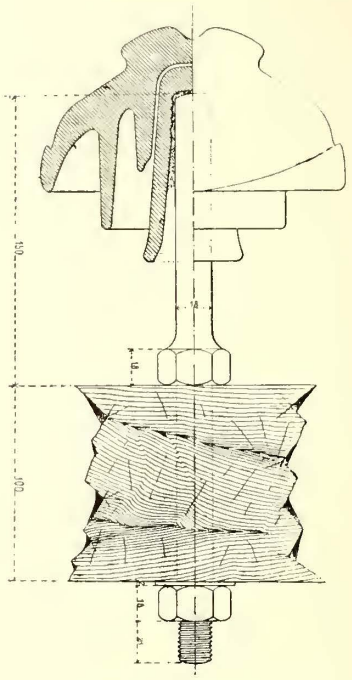


FIG. 3.—LINE INSULATOR

ROLLING STOCK

This consists of twenty motor cars, all of the so-called American type. The car body has a length of 17.89 m (59 ft.), a height of 4.145 m (13 ft. 8 ins.) and a width over sash rails of 2.96 m (6 ft. 5 ins.). Each is divided into two first class, two second class and two third class compartments, making a total carrying capacity of about ninety passengers with sixty-three seats. Each car is equipped with a Westinghouse air brake with motor compressor. There are four motors on each motor car with two series-parallel controllers and four contact shoes, two on each side. The motors are of the G. E. 55-H type, with a rated capacity of 160-hp each.

The steam power station was installed by Franco Tosi, of Legnano, the motor cars by Miani Silvestri & Company, and the electrical equipment by the Compagnie d'Electricité Thomson-Houston de la Méditerranée.

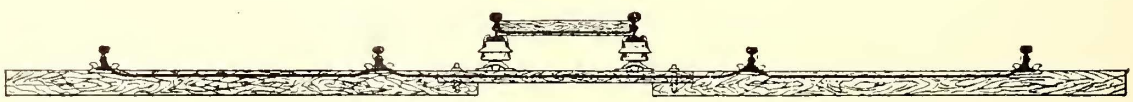


FIG. 2.—SECTION OF TRACK SUPERSTRUCTURE

*Abstract of a paper read before the International Railroad Congress, Paris, September, 1900.

Electrical Traction in Italy

(From Our Special Correspondent.)

According to the latest official count, there are now 1987 miles of street railways in Italy which are operated by mechanical traction. Of this number only 160 miles are electrically operated, and they are distributed as follows:

(1)	Piedmont (City of Turin)	31.26 miles
	Lombardy (Milan and Varese, 3.68 miles)	38.369 "
(2)	Liguria (Genoa and suburbs)	25.65 "
	Tuscany (Florence and Leghorn)	34.24 "
(3)	Umbria (Perugia)	26.65 "
	Lazio (Rome)	17.802 "
	Campania (Naples and suburbs)	4.361 "
	Sicily (Palermo)	6.000 "

The remaining eight provinces—Venice, Emilia, the Marches, Abruzzi and Molise, Apuglia, Basilicata, Calabria and Sardinia—are without electric traction. In fact, the Marches, Abruzzi and Molise, Basilicata and Calabria, though teeming with millions of inhabitants, are without street railway traction of any sort, whether mechanical or animal.

Much is being done, however, to change this condition of affairs, and before long many of the existing lines which are using steam or horses will be changed over to electricity. A number of new lines are being rapidly pushed to completion. The apparatus which will be used on them is of the following makes: Thomson-Houston, Siemens-Halske, Schuckert & Company, Helios, Allgemeine Elektricitäts Gesellschaft, Ganz & Company.

The electric railways now operating in Italy—including those just opened, namely the Palermo-Monreale, built by Schuckert & Company (which presents some rather interesting features); the Sampierdarena-Conegliano (by the Allgemeine Elektricitäts Gesellschaft, of Berlin), and the Musco-Miano, near Naples (4), which is being extended to San Giuliano in Campania—are almost all standard gage and equipped with the overhead system.

The owners of the franchises for a small number of roads which use accumulators have come to terms with the towns in which they operate, agreeing to pay for the right to substitute the overhead system for accumulator traction (5).

The new roads, also, with few exceptions, are standard gage trolley roads. Among them may be cited the Milan-Affari line, which has just abandoned horses for electricity; the Milan-Corsico line, which will do the same thing in a few weeks; the Milan-Monza line (9 miles), which will go into commission about the first of the year as competitor for the traffic which the Mediterranean Railway is now attempting to care for with two storage battery cars (Hensenberger type), with bodies built on the American principle, a description of which has already been given in the pages of this journal.

The city and suburban systems of Catania, now building by the Helios Company, comprises 9½ miles in the city and 10 miles in the suburbs; it will be operated by steam-driven generators, and at 400-volt pressure, the current being used for light as well as power. The suburban system of Spezia is also a Helios outfit. When finished it will have nearly 14 miles of line, and the power plant will contain two 250-hp Tosi compound engines driving generators, and also a battery of accumulators.

Schuckert & Company have under construction some lines in the province of Como. The Thomson-Houston Company is building a line from Ventimiglia to Bordighera, which is to be operated by water power, with a gas plant as a reserve. This line will be extended as far as San Remo. The Allgemeine Elektricitäts Gesellschaft is building a line nearly 9 miles long between Genoa and Voltri.

In addition to the above there is the work being done by the great steam railroad companies of the Mediterranean and Adriatic slopes, who have acquired water-power rights capable of developing an aggregate of 100,000 hp, and who are introducing electricity on the following lines:

Milan-Gallarate-Arona, Gallarate-Varese-Larieno (66 miles), Seco-Colica Sondrio and Colico-Chianenna (68 miles), Bologna-San Felice (26 miles), this last being for passenger traffic only, and to be operated with storage batteries.

The electric railways still on paper can be counted by tens. There are a number, however, that appear to be well under way.

The Fossano-Bra road has begun actual construction, and the Fossano-Mondovi line is about to change over from horses to electricity. Power will be transmitted from Cherasco, where the river Tanaro can be made to furnish about 2400 hp. The work is being done by the Italian Electric Improvement Association, of Milan, and three-phase current at 10,000-volts pressure will be used for the transmission.

At Val Brembana a project for a road is being pushed by L. Magrini, an engineer who proposes to develop about 1000 hp from a fall at S. Giovanni Bianco. A storage battery is talked of for this station.

The line proposed from Samaden to Tirano is an extension of the Campolongo Tirano steam road, which was changed over to electricity. This line is 3-ft. 3-in. gage, and there are some 7 per cent grades; the sharpest curve is on a 130-ft. radius. Direct current at 800 volts will be generated by water power at Mount Paschiano, where it is thought that 3000 hp can be developed.

A company has been formed to construct a line from Vaghera to Varzi, and it has been voted a yearly subsidy of $5,000 for thirty years from the town of Retarbido. It is expected that the company will receive further grants from other towns along the line. Power will be taken from the river Staffosa. The total cost is put at $290,000.

A company bearing the name of Torre del Greco-Torre Annunziata-Castellamare Railway Company has taken over the franchise of the Torre del Greco-Castellamare line.

The Rome-Frascati line is to be operated electrically, and the power plant has already been installed at Ciampino by the Thomson-Houston Company.

The Val Sabbia is to have a long-distance road running from Brescia, through the Edolo and Presseglie valleys into the Val Sabbia, about 4 miles from Vestone; thence, following the Chiese through Vestone and Anfo, and going as far as Ponte Caffaro on the border of the German Tirol.

A company is being formed to build a line from Gadova to Vicenza, to be operated either by steam or electricity; if the latter form of energy be used, power will be taken from the Bracchiglione.

Bergamon and San Pellegrino are also to be connected. A Milanese firm has contracted to furnish electric power at $26 per horse-power. The towns along the line have voted all the subsidies asked by the promotors.

The Camerino-Castelraimondo line (7 miles long) also has been granted a subsidy, which consists of $8,000 for seventy years and $36,800 for a sinking fund.

The line from Bettole di Varese to Luino, being built by the Electric Railway & Tramway Company, of Varese, is 15.3 miles long, and is to cost $397,000. The government has granted a subsidy of $640 a mile, good for thirty years. Thomson-Houston equipment will be used.

In addition to the foregoing, there are quite a number of electrically operated cable roads proposed. This summer one was opened between Saint Vincent, a watering place, and the Fons Salutis Spring.

There are still many lines that have not been mentioned which must, sooner or later, change their methods of traction and adopt electricity. Among these are the systems of Alessandria, Verona, Padova, Bologna, Bari, Messina, etc. In many of these places, however, progress is blocked by the refusal of the operating companies to listen to the demands of the municipalities. In this connection it is interesting to note that for the fiscal year 1900 the city treasury of Rome will be enriched by some $80,000 as its share in the profits from the street railways of the city; while in Milan the city will receive $200,000.

(1) There are two operating companies in Turin, one of which, the North Italian Company, has contracted to add some 13 miles of double track to its system before 1902.

(2) The earnings for the last fiscal year on the various lines of this system, including the hill lines, worked by electrically driven cables, footed up to $606,989, notwithstanding that the Sturla-Nervi line was in actual operation during a few months at the close of the year only.

(3) The roadbed of this line has grades of 6½ per cent and curves of 42-ft. radius.

(4) The present power plant of the Naples Tramways has three 300-hp steam-driven generators, and is to be increased by the addition of a water-power plant.

(5) The North of Italy Company, in Tunis, has agreed to pay the city for the right to use the trolley system, at the rate of 2/5 cent per car mile and 50 per cent of the net profits.

Street Railway Patents

[This department is conducted by W. A. Rosenbaum, patent attorney, 177 Times Building, New York.]

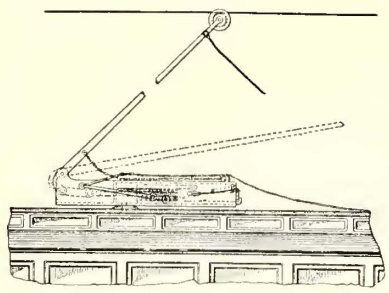
ELECTRIC RAILWAY PATENTS ISSUED NOV. 13, 1900

661,491. Emergency Brake Switch; W. M. Brown, Johnstown, Pa. App. filed Oct. 14, 1898. The invention has to do with the mechanical construction of the switch, with a view to obtaining simplicity, the braking force being the usual "bucking" of the motors.

661,516. Trolley; H. S. Goughnour, Johnstown, Pa. App. filed March 21, 1900. The spring attached to the trolley is auto-

matically thrown out of use when the pole rises above its wire, and this allows the pole to fall to a horizontal position.

661,540. Railway Switch; C. F. Kress, Jr., Johnstown, Pa. App. filed March 19, 1900. The heel of the switch point is provided with a circular enlargement, through which the grooves in the rails are extended, the enlargement forming a support for the pivot pin and rendering it unnecessary to extend the tongue in order to provide for the proper support of the pin.

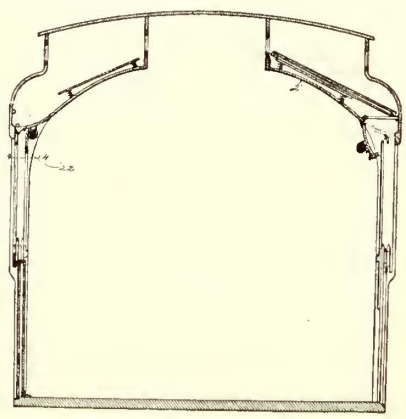


PATENT NO. 661,516

661,572. Air Brake Mechanism for Cars; D. Beemer, Detroit, Mich. App. filed Feb. 25, 1898. The air pump is geared in a special manner to the car axle.

661,600. Trolley Wheel; T. I. Duffy and C. S. McMahan, Chicago, Ill. App. filed July 16, 1900. Contact springs between the harp and the wheel are inserted in a special manner.

661,714. Telephone Circuit; I. H. Farnham and G. W. Davis, Wellsley, Mass. App. filed May 11, 1900. Circuits and apparatus for telephoning between cars and central station. The circuit extends along the road, and is provided with plugging in points where the apparatus on the car can be connected.



PATENT NO. 661,921

661,841. Switch Controlling Device for Surface Cars; C. G. Bauer, New Rochelle, N. Y. App. filed March 26, 1900. The motorman is enabled to force a hook down into a slot in the roadbed for engagement with switch-throwing mechanism located therein.

661,880. Electric Brake Controller; J. C. Lincoln, Cleveland, Ohio. App. filed Oct. 2, 1899. The trolley current is used to excite the fields of the motors when the brake is first applied, and such currents are allowed to flow through the fields after the motors have ceased rotating. This brings the braking force into action at once, and holds the car on a grade after the braking force afforded by the generating motors ceases.

661,921. Convertible Car; J. O'Leary, Cohoes, N. Y. App. filed Aug. 22, 1899. The sash and panels can be moved up into a chamber under the roof of the car.

PERSONAL MENTION

MR. J. B. FISHBURN has just been elected president of the Roanoke Street Railway Company, of Roanoke, Va., to succeed H. S. Trout, resigned.

MR. C. A. BABTISTE has been appointed Western manager of the STREET RAILWAY JOURNAL, vice Mr. C. S. McMahan, resigned. Mr. Babtiste's headquarters will be at our present office, Room 1520, Monadnock Block, Chicago.

MR. JOHN T. CONWAY, the retiring assistant general manager of the Brockton Street Railway Company, was presented with a handsome diamond ring and gold watch chain by the employees of the company a few days ago. Mr. Conway has been in the service of the company thirteen years.

MR. JOHN PILLING, of Newark, Del., president of the American Hard Fibre Company, died Nov. 8. Mr. Pilling was born at Chowbent, England, March 6, 1830, and was compelled to go to work at the remarkable early age of eight years. At the age of eleven years he had served an apprenticeship at making horseshoe nails. His father came to America with his family in 1841, and both father and son worked in various mills until 1848, when they entered the employ of Joseph Dean & Son, near Newark. Mr. Pilling advanced slowly until he received $10 per week for his services, but resigned this position to accept one at a salary of $5 per week, which, however, gave an opportunity to learn the entire business. He later severed his connections with Messrs. Dean & Son to accept a position in Philadelphia, but returned in 1860 to enter partnership with William Dean. This partnership lasted until 1882, when the concern was incorporated, with Mr. Pilling as president and Mr. Dean as treasurer. Mr. Pilling was married twice, and is survived by his second wife and three children by his first wife.

MR. W. E. HARRINGTON, who has recently tendered his resignation as general manager of the Camden & Suburban Railway Company, of Camden, N. J., was born in Wilkesbarre, Pa., June 3, 1866. He is the son of David C. Harrington, an attorney-at-law, and was graduated from the Mechanical Engineering Department of the University of Pennsylvania, with the degree of B. S. in 1887. In 1888 he entered the employ of Keasbey & Mattison, of Ambler, Pa., as a designer, and in 1889 and 1890 supervised the construction of an electric railway at Atlantic City for the Pennsylvania Railroad. In 1891-92, as general manager of the consolidated electric railways at Wheeling, W. Va., he supervised the reconstruction of the lines and entire system. During the next two years he acted as supervising and consulting engineer for a Pennsylvania syndicate, and from 1893 to 1896 acted in a similar capacity for the Camden Horse Railway Company, Camden, Gloucester & Woodbury Railway Company, General Electric Company, Cutter Electric & Manufacturing Company, of Philadelphia, and other companies. While in the employ of the Cutter Company, Mr. Harrington invented and commercially exploited and introduced its entire line of I-T-E circuit breakers. When the consolidation of the electric lines centering at Camden, N. J., was completed in 1896, Mr. Harrington was selected as general manager of the system. The consolidated company is known as the Camden & Suburban Railway Company, and, at the time Mr. Harrington assumed charge, the system comprised 35 miles of track, which was in bad condition, and with no systematic organization. During Mr. Harrington's connection with the company, the entire system has been almost entirely rebuilt, and 16 miles of new track has been laid. A new car house and power station have been designed and built under his supervision, and a park has been laid out. The latter contains a theater, merry-go-round, boats, etc., and has been remunerative to the company. Mr. Harrington has always had the greatest consideration for his employees. He has established a reading room for them, and was instrumental in organizing an association, which holds monthly meetings, and provides instruction and entertainment for them. The service stripe system was also introduced by Mr. Harrington, and a stripe is given for each five years of service. Faithful service is also rewarded by each employee being presented with a uniform after five years of service and each succeeding year until ten years are reached. After completing ten years, and each succeeding year until fifteen years have been completed, the employees are given a uniform and an overcoat. For each year after fifteen years have been served, the men are presented with two uniforms and an overcoat. Mr. Harrington was president of the Electrical Section of the Franklin Institute in 1898, and has been a member of the American Institute of Electrical Engineers since 1889. He has presented papers on engineering subjects before various technical bodies, including the American Street Railway Association. Mr. Harrington has matured no definite plan for the future. He will take a well deserved rest of a few weeks.

W. E. HARRINGTON