Scientific American.

ESTABLISHED 1845

MUNN & CO., - - - EDITORS AND PROPRIETORS.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, - - NEW YORK.

TERMS TO SUBSCRIBERS

One copy, one year, for the United States, Canada, or Mexico..... $3.00
One copy, one year, to any foreign country, postage prepaid. £0 16s. 5d. 4.00

THE SCIENTIFIC AMERICAN PUBLICATIONS.

Scientific American (Established 1845).....$3.00 a year.
Scientific American Supplement (Established 1876)..... 5.00 "
Scientific American Building Edition (Established 1885)..... 2.50 "
Scientific American Export Edition (Established 1878)..... 3.00 "

The combined subscription rates and rates to foreign countries will be furnished upon application.
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MUNN & CO., 361 Broadway, corner Franklin Street, New York.

NEW YORK, SATURDAY, AUGUST 4, 1900.

ELECTRICAL EQUIPMENT OF THE PARK AVENUE TUNNEL.

The New York Central Railway Company is just now engaged in carrying out much needed improvements in their New York terminal station at 42d Street, and it is probable that before winter there will be placed at the disposal of the public waiting-room and other terminal facilities, which will be fully up to the standard set by the leading railroad companies of the world. Now, that the directors have remedied one great defect at this station, it will be the earnest hope of the traveling public that they will take in hand another and even more serious drawback, which is painfully evident to every one who enters or leaves New York City over the lines of the New York Central, or the New York, New Haven and Hartford Company. We refer to the two miles of tunnel beneath Park Avenue which forms the approach to the Grand Central Station. The tunnel is, at all times, a source of inconvenience to the traveling public, and it is not stretching the point too far to say that during two or three months of the year it is atrociously uncomfortable. It is not an uncommon occurrence, during the summer months, when the temperature is between 90° and 100° in the shade, and the humidity near the saturation point, for outgoing and incoming trains to be stopped by signal within the tunnel itself. This delay, we are willing to believe, is not due to any carelessness or poor management on the part of the railroad company, but to the fact that an enormous amount of travel and switching of trains has to be accommodated in a yard that is altogether too small to accommodate it. Whatever the cause, the fact remains that every day crowded trains are delayed in the tunnel, sometimes for several minutes together, when the cars, owing to the sulphurous gases with which the tunnel is filled, have to be tightly closed. The resulting temperature and atmosphere within the cars is positively unique. It can scarcely be equaled, and certainly cannot be surpassed, on any railroad in the world. The nearest approach to it, is, or rather was (for they have made the necessary change to electricity), on the underground railways of London; but there is this difference, that while the air in the London railways was sulphurous, it never approached the intolerable humidity and heat to which travelers through the Park Avenue tunnel are exposed during at least three months of the summer.

If the windows and ventilators of the train could be kept open, there would be a considerable measure of relief; but this is impossible so long as steam traction is employed and hundreds of locomotives are filling the tunnel with poisonous fumes. There is, however, a remedy which is perfectly practicable, and which consideration for the health and comfort of its patrons should lead the New York Central Railroad to adopt without delay. We refer to the electrical equipment of the line from the Grand Central Station up to the Mott Haven yards, beyond the Harlem River. Hitherto, when this improvement has been suggested, the directors and engineers of the company have replied that the art of electrical traction for heavy trains was not sufficiently developed to enable them to undertake its installation with any certainty that it would be a practical success. That may have been true in the past, but it is not true to-day. The success of electrical traction in the Belt Line tunnel at Baltimore, on certain sections of the New Haven Road itself, and in the underground tunnels of London, proves that the day has come when the New York Central Railroad Company may safely undertake a work which can no longer be regarded as an experiment.

We have spoken of the extraordinary discomfort to the passengers who pass to and from the Grand Central Station; but there is another section of the public whose claims are too numerous and just to be ignored. We refer to the residents in Park Avenue and in the neighborhood of the Forty-second Street yard, who have a perfectly reasonable ground for complaint in the noise and dirt occasioned by the continual switching that is inseparable from the handling of the immense amount of traffic that enters this station. All the smoke and dust and most of the noise, attached to the present system of switching with steam locomotives, would be avoided by the use of electric traction; and while the equipment of this yard with its complicated cross-overs and switches would be a matter calling for considerable thought and skill, there is no reason to suppose that it is beyond the power of any first-class electrical engineer of to-day.

AN IMPORTANT PATENT SUIT.

On May 8, 1879, an application was filed by George B. Selden, of Rochester, N. Y., for a patent on a "road locomotive," the power of which was derived from a hydrocarbon-motor. For years the specification and drawings remained in the Patent Office; and not until November 5, 1895, were letters patent finally issued. The long interval between the filing of the application and the granting of the patent, although remarkable, is not uncommon; for interference proceedings or shrewd maneuvering on the part of attorneys may delay the issuing of the patent. Had Selden received a patent in 1879, he could hardly have derived any benefit from the practical application of his invention, in view of the state of the motor-carriage industry at that time. As it is, however, his invention promises to give automobile manufacturers no little concern. The scope of Selden's claims, and the fact that he seemed to be a pioneer in his particular field of activity—indeed, the Commissioner of Patents has even stated such to be the case—induced the Columbia and Electric Vehicle Company to purchase the patent. For that reason the company has begun an infringement suit against two of its rivals, the outcome of which is awaited more or less anxiously by many, if not all, manufacturers of petroleum vehicles.

Whether the Selden patent be valid or not, is a question which can be definitely answered only by the courts. Certain it is, that if the charge of infringement be sustained, the shops of many an automobile maker will be closed.

It is not the particular type of engine used by Selden upon which the suit is based; indeed, if the truth must be told, the engine would now be considered antiquated. Although a particular type of motor was described, Selden did not limit himself to that type. As he himself stated, any liquid hydrocarbon motor of the compression type might be used. He did, however, claim to have been the first to employ in combination with a carriage driven by a hydrocarbon motor a clutch mechanism interposed between the driving shaft and the propelling wheels, by means of which mechanism it was possible to throw the motor and the driving-axle in and out of gear. Selden saw the inconvenience of extinguishing the ignition flame in order to bring the carriage to a standstill. The necessity of starting up the motor by hand rendered the provision of a device, whereby the carriage could be stopped, although the motor were still in operation, of no little importance. He, therefore, introduced the clutch which, it may be safely said, constitutes the cardinal element of his invention. The arrangement is covered in the first and broadest of his claims, which reads:

"The combination with a road-locomotive, provided with suitable running-gear including a propelling-wheel and steering mechanism, of a liquid hydrocarbon gas-engine of the compression type, comprising one or more power cylinders, a suitable liquid-fuel receptacle, a power-shaft connected with and arranged to run faster than the propelling-wheel, an intermediate clutch or disconnecting device and a suitable carriage-body adapted to the conveyance of persons or goods."

It has been stated that a shaft arranged to run faster than the propelling wheels and an intermediate clutch or disconnecting device was never known before the date upon which Selden filed his application. The suit will be watched with much interest by the profession, as there is a good deal of difference of opinion as to the general line of defense that will be taken up by this defendant.

RAIL-JOINTS AND STREET NOISES.

Speaking of the contribution of railroad traffic to the sum total of city noises, reminds us that the present form of rail-joint contributes a large share to the general din of street and railway travel. In spite of the many excellent forms of rail-joints that have been brought out in the past ten years, such a thing as a noiseless joint has yet to be produced. Evidence of this fact can be found in listening to the "anvil chorus" which marks the progress of a train on the Manhattan Elevated Railway, where the blow which is given by every wheel as it passes the joints may be heard many blocks away; and yet the Manhattan Railway has been fitted exclusively with a joint which is acknowledged to be one of the very best on the market! In the case of the Manhattan Company, it is only fair to say, the noise is greatly intensified by the metallic structure of the viaduct, which acts like a huge sounding board.

The concussion which is produced whenever a wheel passes a joint is due to the fact that as a wheel leaves the end of a rail, that rail end is depressed below the end of the rail against which it abuts, and consequently the wheel, in passing to the rail ahead, strikes it a blow which has considerable longitudinal effect in it. Hence, the loud clangor which accompanies the passage of the train over a stretch of track with "loose" or "low" joints, a clangor which increases in direct ratio to the poor quality of the track.

If ever the inventor shall succeed in producing a joint that is literally "as strong and stiff" as the body of the rail itself, this trouble will vanish and we shall have a practically silent track. Some of the best joints upon the market come, theoretically, up to this mark; but when they are placed in the track, and are subjected to the hammering action of the enormously concentrated loads which characterize the modern engine and train, it is not long before the well-known click begins to be noticeable, giving warning that the failure of the joints has commenced, and that a deterioration has set in which no amount of subsequent care on the part of the section gang can prevent. During the past few years we have watched with great curiosity the behavior of the joints on certain sections of the underground trolley lines in this city and on certain trunk railroads which have their terminus here. The rails in each case weigh from 100 to 107 pounds to the yard, and the joints are well spliced and heavy; yet it has never been more than six to nine months before the hammer-like blow of the wheels, as they passed the joints, began to be audible, and each year's traffic has shown a slow but certain deterioration in their resisting power. Theoretically, the perfect remedy is to be found in abolishing joints altogether and welding the rail ends. Could this be done, and carefully done, when the rails are first put in, we see no reason why the difficulty should not be solved altogether, and for good. And we suggest that while the Metropolitan Railroads are making the vast improvement of putting in the third-rail and abolishing the locomotive, they should also try the welded joint on a mile or two of their track, to see whether they cannot at least modify, if not altogether abolish, the loud hammering which marks the passage of their trains.

RESOURCES AND IMPROVEMENTS IN CHINA.

China is essentially an agricultural country. Horticulture is a favorite pursuit and fruit trees are grown in great variety. Sweet barley, maize and millet and other cereals, with peas and beans, are chiefly cultivated in the north, and rice in the south. Sugar, indigo and cotton are cultivated in the southern provinces, and opium is a crop of considerable importance. Tea is cultivated in the west and south. The culture of silk is equal in importance to that of tea. The mulberry tree grows everywhere. There are cotton mills at Shanghai and silk is wound from cocoons in Shanghai, Canton and elsewhere. All of the eighteen provinces contain coal and China may be regarded as one of the first coal countries in the world. Iron ores are abundant and copper is plentiful in certain districts. The commercial intercourse of China is quite considerable, trade being carried on with the principal countries of the world, includiug the United Kingdom, Germany, France, Russia and the United States. The great source of revenue for the provinces is the duty on goods coming overland from the adjacent provinces.

Until February, 1898, no foreigner could travel in the Empire except at certain designated points, usually the treaty ports, but since that time all foreigners who have passports, may visit any part of the Empire on pleasure or business. The roads in China are poor and only a few are paved, and for this reason the greater part of trade is carried on by means of numerous canals and other waterways. The country is irrigated by great rivers, and intersected by a system of canals which is more than six hundred years old. The canals are badly managed and are in a state of decay.

Less than five hundred miles of railway have been constructed in China, but a very complicated system has been projected, and Government concessions have been given for the purpose. It is likely that as soon as the present trouble in China is adjusted, that this country will be the scene of great activity in railway building. In all, concessions have been given for 7,500 miles of railway. This will include connections with the Chinese Eastern Railway, the railways to Shanghai, Hankow, Canton, and Mandalay. As the country is 3,500 miles long from north to south, possessing a varied climate, productive soil, and great natural resources, it will be seen that there is a vast field for enterprise in railway building, and European countries and the United States are only desirous of seeing a stable and friendly government established before they begin to invest their capital in vast railway enterprises which cannot but prove to be profitable investments.

All the principal cities of the Empire have telegraph service. An arrangement was made with the Russian telegraph authorities in 1892 by which communication was established between Peking and Europe. The apparatus and methods used in telegraphing in China are of the most primitive description. The Chinese have no alphabet, but each word has a sign. In order to telegraph them, each sign has to be numbered, and the number is sent by wire. The receiving clerk refers