OTTO GAS ENGINES AT THE PHILADELPHIA ELECTRICAL EXHIBITION.

The application of the "Otto" engines to electrical purposes has grown very much during the last year, and at the exhibition three different sizes of engines are shown in connection with incandescent plants—one 4 horse power engine running 25 Edison lights and one 7 horse power engine running 40 Bernstein lights. Both these engines are of the usual type, so well known for its simplicity; and while with it impulse takes place only once for two revolutions when fully loaded, or even for many more revolutions when partially loaded, they are run under the control of a sensitive governor and under the influence of the momentum of well proportioned fly wheels in a manner to produce all that is required with respect to regularity to drive incandescent machinery

A twin engine of the Otto type is also exhibited, indicating 15 horse power and producing under full load an impulse at every revolution; but as the exhibitors, Messrs. Schleicher, Schumm & Co., propose to show the practicability of their single cylinder engines, and most simple construction for incandescent lighting especially, the twin engine, whose less simple construction seems naturally to secure a higher degree of regularity, was not considered worth while to be brought to a test, and is not connected to any electric machine

The power for electrical lighting being used at certain times in the evening only, an engine which is started without lengthy preparations, needing no boiler, and whose running expense is limited to the time of use only, seems not only very suitable, but renders incandescent plants practical in residences and halls not connected with the wires of an electrical station.

It is also important that in such cases the motor used possesses the greatest simplicity in parts, making it possible that domestics ordinarily employed about a household can assume its management.

In this respect, the application of a single cylinder gas engine is preferable to more complicated variations in construction. Besides the purpose of electric lighting, the Otto engine is much used for other electrical work. The small sizes are driving the commutators in our leading telephone offices. The Philadelphia Local Telegraph Company create, with a 10 horse power Otto and Edison dynamo, the necessary current for about 400 instruments, for brokers' and other offices in Philadelphia and New York.

Otto engines are also used for metal plating by electricity, electrotyping, for photography with electric light; and the electrical railway worked along Brighton Beach in England, about one mile in length, has its current produced by an 8 horse power Otto. The fact that this electric railway is a paying enterprise is certainly in part due to the use of such an economical prime mover.

Exporting Steel Rails.

According to the *Railway Review*, for the first time in the history of our rail mills they have made a large sale of steel rails abroad. The Lackawanna Iron and Coal Company has contracts to deliver 10,000 tons of steel rails at Brockville, Canada, for the Canadian Pacific at a figure varying not far from $28 50 per ton. It is not so very long ago that we were importing steel rails to a not inconsiderable extent, and our ability to now turn about and compete successfully with the mills from which we have so recently bought indicates the existence of possibilities in an export trade in steel rails that should not be lost sight of.

NEW GRIP SYSTEM FOR ELECTRIC RAILROADS.

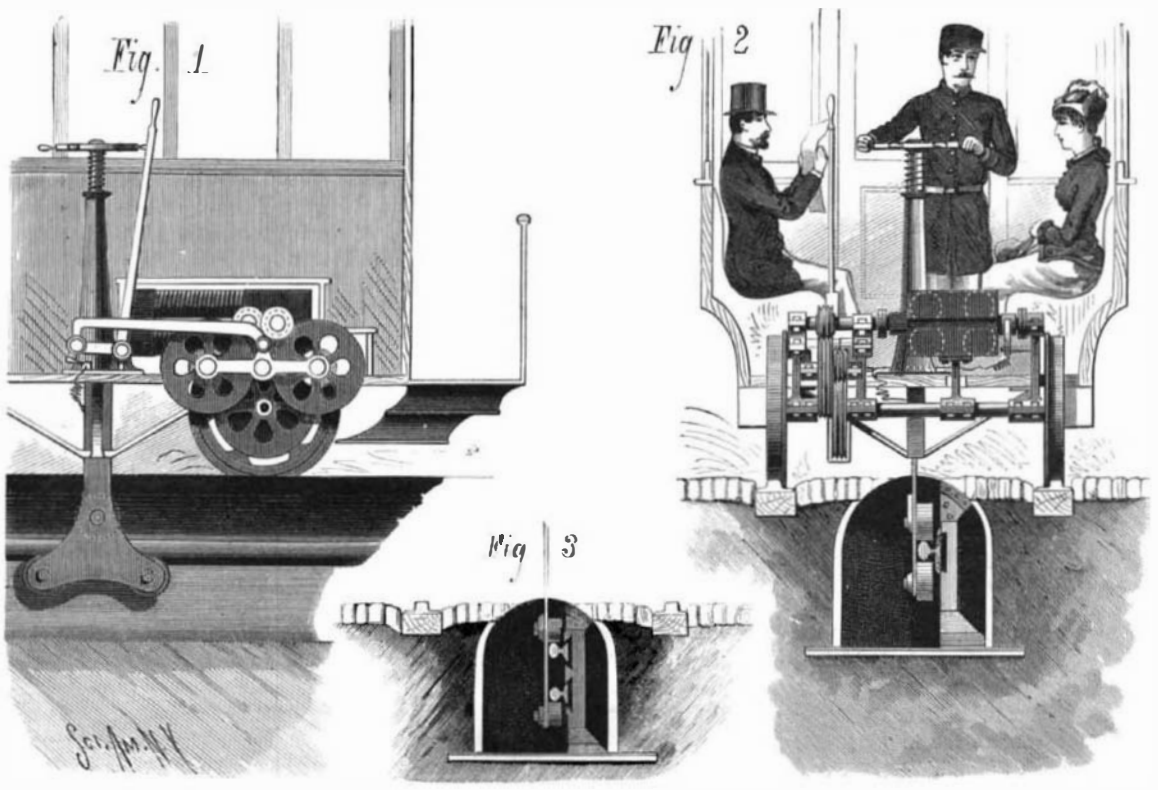
In the earlier electric railroads the general plan was to use the rails as conductors, and while, theoretically, this was the best and cheapest way, in practice it was found to possess many disadvantages—perfect insulation was difficult, and good contact between the rails and wheels was not always to be obtained because of mud, ice, etc. In addition, there was danger that animals might come in contact with the rails. No matter how powerful the current used, the tractive force was limited to the weight of the car, and, of course, any attempt to carry extra weight to overcome a grade would result in additional expenditure of power on a level.

In the system of Mr. John C. Henderson, Civil Engineer of this city, in case of danger one movement of a lever instantly throws the whole tractive force in the opposite direction with the full power that is being used at the time, irrespective of the motor car. The car can be reversed and run back, as when overrunning a switch, and in case of a large conflagration in the city the road can be kept in operation by simply introducing two or three crossovers in the length of the line. The conduit can be constructed of iron, concrete, or timber, according to the locality, and having no movable cable running through it the extra space can be used by electric light and other wires.

This system is very simple in construction, as will be seen from the engravings. A fixed bar or bars are supported according to requirements in a conduit beneath the track, in the same manner as in the cable system, and are insulated by chairs or shoes at the supports. The grip takes hold by rollers under the bar; the grip shaft passes up through the bottom of the car, and upon its upper end screws a hand wheel. By turning this wheel in a direction to raise the grip, all the tractive power required can be obtained. The grip also conveys the current to the motor, and back from and to the bars, as the case may be or the locality require, since in some instances it may be advantageous to use only one bar, the return being obtained through both rails and the iron conduit.

By means of a lever the electric motor can be shifted so that a pulley upon the armature shaft having a V-shaped face will be in contact with similar pulleys driving the axle; by this means the direction in which the car is moving can be changed without interfering with the current.

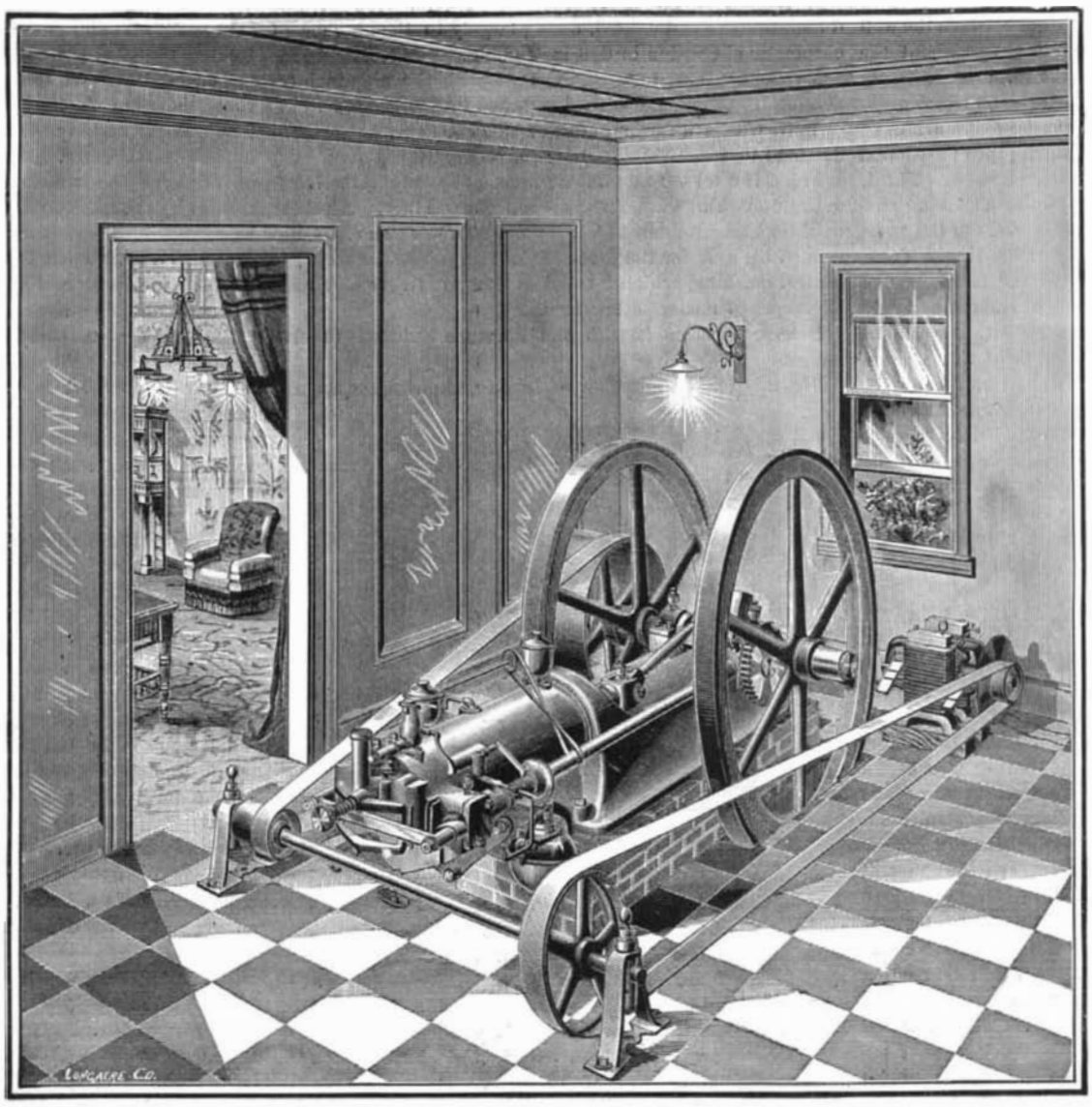
Further particulars regarding this system may be obtained of J. C. Henderson, 2 Liberty Street, New York city.



NEW GRIP SYSTEM FOR ELECTRIC RAILROADS.

Chilled Roll Casting.

Messrs. Taylor & Farley, the well known roll makers of the Summit Foundry, West Bromwich, England, have just completed a very large pair of chilled rolls for Messrs. Bolckow, Vaughan & Co.'s new plate mill at the Eston Steel Works, Middlesborough. The rolls referred to are 30½ inches diameter, finished size, and have been cast with a hole through the center, this hole being about 7 inches diameter in the middle part of the roll, and tapered down to a smaller size at the neck and wabbler ends, in accordance with the design of Mr. Franklin Hilton, the steel company's engineer. These rolls have been so cast hollow with the object of counteracting the unequal expansion and contraction which is so frequently the cause of the breakage of chilled rolls, having regard to the well known difficulties inseparable from the casting of chilled rolls, more especially rolls of large diameter—difficulties which are increased by coring out. On being turned, these rolls presented a splendid working surface with a perfectly regular chill three-quarters of an inch deep, and are absolutely free from blow-holes or other defect; indeed, they will stand microscopic inspection. Experienced manufacturers of iron and steel who have inspected these rolls have pronounced them to be a magnificent pair. The large and powerful plate mill above mentioned was successfully started on the 16th of October, in the presence of Mr. Bolckow, Mr. Windsor Richards, and a number of other gentlemen of eminence in the steel and iron trade.



THE OTTO GAS ENGINE AT THE PHILADELPHIA ELECTRICAL EXHIBITION.

Cholera Boxed Up.

It is said that two doctors of Marseilles fancy that they have succeeded in discovering the morbid agent of Asiatic cholera, which, according to their statement, is a "mucor" entirely distinct from the "comma" of Dr. Koch. Considerable amusement was created at the Academy when the perpetual secretary, Professor Beclard, exhibited the sealed box which contained preparations and specimens of the offending "microbe." Amid a general burst of laughter, the president was requested "to keep the box sealed." Thus does the spirit of comedy invade the ground of tragedy even in the most serious of human affairs.