In The Field Of Electricity

A Wireless Trolley.

EVERY improvement in electrical systems carries with it the promise of a new revolution in a business that is a succession of revolutions. The latest revolution promised is an invention of L. W. Pulien of Camden, N. J., by which, it is claimed, the overhead wire and the third rail will be dispensed with, and electric cars driven by an invisible system. At intervals of sixteen feet or more extending midway between the tracks is a series of little metal buttons, and that is all. The buttons rise only an inch above the surface of the street or road. One must look closely to see them.

The system itself, however, is extremely simple. These inconspicuous little buttons are perfectly dead, electrically, until the car touches them. A powerful magnet carried beneath the car serves, however, to close the circuit beneath the metal buttons, whereupon the buttons become suddenly alive, giving what energy is needed to the car. The current thus picked up returns by the regular trolley rails, which thus complete the circuit. The instant the car has passed and the magnet has ceased to influence the metal button armature below the points of contact, the little metal button is left dead once more.

The metal buttons are in reality the tops of air-tight boxes sunk flush with the level of the street. The box itself is about ten inches square and two inches deep. Their mechanism is extremely simple, and therefore unlikely to get out of order. These boxes placed at intervals of sixteen feet are in turn connected by an underground conduit, which brings them all into the same circuit. This wire, it will be seen, is completely buried underground beneath the pavement of the stret, so that its danger is absolutely nil.

Exhaustive tests have been made by the Wireless Railway company to prove the absolute scientific safety of the wireless system.

It is the important economy in installing such a system, however, that will probably make the strongest appeal to the railroad management of the thousands of miles of trolley lines throughout the country. The argument for the new system over all existing systems sounds very convincing. The wireless system requires little or no digging. It is possible if desired to run the conduit connecting the contact points along the surface of the ground enclosed in a wooden covering. The cost of the new system is also somewhat less than the objectionable overhead or even the third rail system.

The First Electrician.

The Electrical World and Engineer, in an article by Brother Potamian, professor of physics in Manhattan college, pays fitting honor to the memory of the medieval student whose researches in magnetism appear to entitle him to be called "The First Electrician," and hence the beginner of the great industry by which that journal lives.

His name was Pierre de Maricourt, commonly called, from having made a journey to the Holy Land, Petrus Peregrinus, or Peter the Pilgrim. Before his time the lodestone, or natural magnet, was well known, but was regarded chiefly as a curiosity, though it had begun to be used by seamen, in a rude form of the mariner's compass, as a means of finding which way was north when the stars were hidden.

In the year 1269 this Peter the Pilgrim was employed as a military engineer in the army of Charles of Anjou, at the siege of Lucera, in southern Italy. Probably his military duties did not keep him busy, for he found time to consider what he had learned about the lodestone and to endeavor to apply its force in the construction of a motor.

He thought he had succeeded in inventing a machine that would go on forever, and his delight was so great that he sat down and wrote a long letter to a friend at home in Picardy, one Sigerus do Foucancourt, in which he described not only his perpetual motion machine, but told the results of all his experiments with the magnet. From this letter Brother Potamian finds that:

1. Peter the Pilgrim was the first to assign a definite character to the poles of a lodestone, and to give directions for determining which is north and which is south.

2. He proved that unlike poles attract each other, and like poles repel, and that a pole may neutralize a weaker like one and even change its polarity.

3. He was the first to pivot a magnetized needle and surround it with a graduated circle, and to determine with this device the position of an object by its magnetic bearing as done today in compass surveying.

4. He established by experiment that every fragment of a lodestone, however small, is a complete magnet, thus anticipating a standard modern laboratory illustration of the molecular theory.

5. His magnetic motor, while, of course, its motion failed to be perpetual, curiously anticipated the modern electric motor in its plan of construction and in its reliance on constant changes of polarity in the field to pull the armature around and keep it revolving.

Seeing by Electricity.

"Various methods have been proposed from time to time for transmitting sight electrically," says Electro, "but they seem to lack certain necessary features. A system has been devised by M. A. Nisco, however, which seems to him to be practical. A sensitive screen is prepared by coating a metallic net with some insulating gum. Into the meshes of this net copper wires are inserted before the insulation hardens. After drying the surface is dressed off with a file and is then coated with selenium, thus forming a sensitive connection between the wires and the net. The screen prepared in this way is treated to crystallize the selenium, so as to bring it into the proper sensitive condition. The copper wires which terminate in the screen are then led into an ebonite cylinder, and pass out through holes corresponding in position to their termination in the sensitive screen. These holes are arranged in spirals in such a way that a metallic blade which revolves around the cylinder successively makes contact with every terminal. The blade is revolved about the cylinder at a speed of 600 revolutions per minute, so that every contact is repeated ten times a second. From the blade and from the wire net of the sensitive screen wires are led through a battery and to a telephone receiver. If a picture be thrown upon the sensitive screen and the blade be revolved about the cylinder a varying current will be sent through the telephone, the intensity of which will vary with each contact, according to the intensity of the light falling upon the corresponding section of the screen. This telephone by means of a sensitive carbon microphone repeats through the transmission line the current variations produced by the apparatus just described. At the receiving station a second telephone repeats the variations in current through a second microphone in a local circuit arranged to produce a spark. The intensity of the spark at any instant corresponds to the intensity of illumination of a particular part of the selenium screen. This spark-gap is placed within a cylinder having spiral slots, and the slotted cylinder revolves in synchronism with the contact blade at the transmitting station. This arrangement throws the light of each spark on such a part of a receiving screen as to produce an illuminated image similar to that thrown on the sensitive receiving screen. The method can only produce variations in illumination. It requires two wires, one for synchronizing the moving parts and one for transmitting the varying current."

International Electrical Congress.

"According to the present indications," says the Electrical World and Engineer, "the International Electrical Congress, to be in session at St. Louis September 12 to 17, 1904, will be one of the most successful that has yet been held, both with respect to the number of adhesions and to the value of the transactions. Up to date about 3,550 circular letters of invitations to join the congress have been issued to persons or associations in North America. From these 575 postcard acceptances of membership have been received. About 350 similar circular letters of invitation have been recently sent to other countries. It is intended to issue in all about 5,000 invitation circular letters in America and about 6,000 in foreign countries. It is expected that many persons will join the congress, both in America and abroad, who do not expect to attend the sessions in St. Louis, in order to secure a copy of the transactions, which will form one and perhaps two large octavo volumes. Recently 200 special letters of invitation have been issued on behalf of the committee of organization to prominent electricians and electrical engineers, signed by the president and general secretary of the committee, requesting papers for the congress in the various sections. Of these 146 have been sent to foreign authors, and 134 to American authors. There has not been time to receive replies from more than a few foreign authors, but twenty-one acceptances have, up to date, been received from abroad and forty-six acceptances from North America. Sixty-seven papers are thus already promised for the congress, and the number is steadily increasing. A considerable number of invitations to contribute papers have yet to be issued. It is hoped that the congress will convene with a full program in each section and that at least half of the papers may be from foreign countries. According to the plans of the committee, papers for the congress program are specially invited, but papers voluntarily offered will be submitted to the officers of the sections to which the papers belong, and may be included in the program by invitation at their request, if the subjects are desirable, and if the schedule alloted to each section will permit, it being the desire of the section officers to secure and offer the best possible program and presentation."

Telegrams by Wire Fence.

Two ingenious New Englanders, young, ambitious to become masters of the telegrapher's key, having no capital with which to erect poles and string wire, concluded to experiment with a barbed wire fence as a means of transmitting messages. "About 100 feet east of my father's house," says one of them, "was a barbed wire fence which we found on investigation extended to within only a few rods of my friend's home. The fence didn't follow a straight line by any means—there were several short breaks in it. Here and there it surrounded a cow pasture or a hennery, or described a semicircle back of a dwelling. But these irregularities, we thought, did not matter. We were determined to utilize that fence.

We knew that paint—ordinary house paint—was a good nonconductor of electricity. My friend's father had just built and painted a new barn, and he had three or four quarts of the paint left over. This was more than enough for our needs.

"With a small brush we applied a dash at every point where the barbed wire strand we decided to use was fastened. We were careful to see that the oily substances got in between the wire and the post, or between the wire and the trees, as the case might be. When the first coat had become thoroughly dry, we applied another in order to make the insulation as complete as possible.

"Then arose the question of batteries. Why, we asked ourselves, were glass cells necessary? Would not any sort of self-insulating receptacles of suitable size answer the purpose? If so, there were enough half-gallon paint pots at our disposal to furnish a complete outfit of crowfoot batteries. We tried one, by way of experiment, and found that it worked admirably.

"How to secure zinc plate and coppers for the batteries was next to be considered. We already had four zincs, but at least three times that number would be needed. I suggested that we make some ourselves, by collecting and melting a quantity of old zinc sheeting which the farmers in the neighborhood had used to protect their orchards from caterpillars.

"By making an impression in some moulders' sand with one of our old zincs we were able to turn out a dozen plates without any trouble. The coppers—second-hand, to be sure, but none the less serviceable—we obtained from our good friend, the station agent, who never hesitated to discard as useless to himself anything likely to be of value to us. A few pounds of blue vitriol would suffice to generate the current, and for this we had to pay, as I remember it, about $1.

"Well, after giving those batteries from twenty-four to thirty-six hours in which to acquire their full strength, our instruments—cheap and clumsy as they were—responded perfectly. The only difficulty we experienced was in rainy weather, when the water, trickling down the fence posts, robbed us of 'fluid' by partially grounding the circuit. Even this annoyance might have been overcome by using relays.

"Was the line of any real benefit to us? Perhaps you can answer that for yourself when I tell you that we used it for three years and became expert telegraphers."

High Speed Promised.

A "mono-rail" line is to be laid between Paris and Marseilles, and travel at the rate of 180 miles an hour is promised. Surveys have been going on for some time on the outskirts of the capital, at the Mediterranean seaport, and some localities between them. But one train on the Continent will be able to compete with it, and that is the Berlin-Hamburg, which is not yet finished, and the speed of which is to be 130 miles an hour. The Paris-Marseilles train will be faster still. But, according to all the information, passengers will not, at the first, be conveyed by the French mono-rail. The French mono-rail is to be restricted, at the beginning at any rate, to parcels and goods traffic. In this it is expected to create an astonishing revolution. In the first place, the whole newspaper world of Paris is deeply interested in it. A Paris newspaper posted early in the morning reaches Marseilles late at night—rather late, one would think, for the reading public. By the mono-rail it can be delivered at about 10 o'clock in the morning.

He Caught It

A southern Missouri exchange tells of a traveling man who stopped one night in a hotel in a small Ozark county town and asked to be called at 3:30 o'clock so that he might catch a train. In order to accede to the guest's request the landlord had to remain up all night, as he had no clerk and no alarm clock. He found it hard to keep awake, and when 3:30 o'clock finally did come he was in a surly frame of mind. Knocking on the guest's door, he said: "Git up, it's 3:30." In a sleepy tone of voice the guest replied: "Oh, I guess I'll let that train go and sleep until 7 o'clock." "Well, I guess not," said the landlord. "I've stayed up all night to git you up and you're goin' to git up." The guest caught the early train.—Kansas City Star.