Electrical Notes.

M. Edward Branly, the well-known French electrician, who has long been interested in the problem of wireless telegraphy, has now perfected a device which it is stated will considerably develop communication by this means. It is called the improved Branly radio-conductor. The Branly coherer is already employed in wireless telegraphy, but the value of the new device is the important discovery that any two pieces of metal, provided one of them be polished or oxidized, will serve all purposes of the tube. Any metal will suffice for this object. The result has even been secured with a common needle. The new radio-conductor consists of a horizontal plaque of polished steel connected with one pole of the circuit, on which rests a small metallic tripod connected with the other pole, the three points of the tripod being oxidized.

An ingenious electric switch for crossovers of road surface railroads has been devised by Messrs. S. Dixon & Sons, electrical engineers of Leeds, England. The feature of the invention is the simultaneous automatic adjustment of crossovers on the rails and overhead wires of an electric system, the object being achieved by means of a small switch conveniently placed in front of the driver of the car. The switch is connected by ordinary electric wires with the trolley head, and is so arranged that when passing a convenient position in front of the crossovers to be moved, by merely turning the switch the points on both rails and the trolley wire overhead are opened, while a second contact after passing the crossover closes them. The necessary batteries for the circuit are inclosed in a box beside the track. The contrivance, which is extremely simple in mechanism, is also fitted with a hand lever, which in case of any breakdown in the electrical equipment can be used to set the crossovers and overhead switch by one movement. The cost of the equipment is about $500 for each set of crossovers.

A comprehensive idea of the remarkable developments of electrical traction in England, especially in London during the past two or three years, may be gathered from the fact that whereas last year Parliamentary powers were sought for an expenditure of $200,000,000 on tramways in the United Kingdom, this year the capital required for the proposed tubes, trams, and trains in London alone represents an outlay of not less than $250,000,000. The possibilities of electric surface railroads in the English metropolis may be gathered from the fact that the London United Tramways, with 16 miles only in operation, carried in twelve months 35,000,000 passengers; while in the same districts in which this street railroad is in operation, there are now under construction 42 miles, and new extensions are proposed of 15 miles, making a total, with tubes and light railways, of 94½ miles. Hitherto one of the greatest obstacles to electric progress in Great Britain has been the discouragement presented on the one hand to scientific and manufacturing skill, and on the other hand to financial enterprise, by illogical legislation. This prejudice against electric traction, however, has now been overcome, and Parliament is seeking to encourage its development as a solution of the problem of housing the working classes, by affording rapid transit facilities between the city and the suburbs. At the present time the capital invested in Great Britain in electric light, power and traction is $4.30 per head of the population, in Germany it is $2.50, and in France $1.64.

For some time past pressure has been brought upon the English government for the establishment of direct telephonic communication between London and Brussels, similar to that already existing between London and Paris, but it has hitherto proved unavailing, since the distance was considered too great between the English and Belgian coasts for laying a submarine telephone cable. Now, however, all difficulties in this direction have been surmounted, and a cable is being manufactured for spanning the North Sea. The work is being carried out for the British postal department, who are working in conjunction with the Belgian government. It is anticipated that the laying of the cable will occupy about six weeks, if the weather is propitious. The cable, which will be the longest submarine telephone cable in existence, will run from St. Margaret's Bay, near Dover, to La Panne, a point near Ostend, fifty-six miles distant. At Brussels, by means of the exchange, facilities will be made for a person in London to ring up a correspondent in any town in Belgium with the ease with which it is now possible to talk between the English and French capitals. Except on rare occasions, when there is heavy weather in the Channel or through some other cause of defect, persons talking over the wire between London and Paris can hear one another as distinctly as if they were in one room together, and the authorities state that there is no reason why it should not be the same in the case of Antwerp and Brussels. Should this attempt prove successful, preparations will be made for connecting London with other European cities by telephone.

AN ACETYLENE WIRELESS TELEPHONE APPARATUS.

The accompanying illustrations represent a new apparatus for the making of experiments in light-telephony. In all such apparatus selenium is used, which possesses the remarkable property of varying in electrical conductivity with the amount of light to which it is exposed.

Fig. 1 represents the transmitting apparatus, consisting essentially of a gas-flame manometer, *m*, by means of which the rays of an acetylene light, *f*, concentrated by the condensing-lens, *l*, may be varied in intensity. These differences of light intensity, which correspond exactly to those of the sound-waves of the human voice, transmitted through the speaking-tube, *s*, are sufficiently pronounced to influence the conductivity of a selenium cell, included in the circuit of a telephone receiver, which reproduces the sounds of the

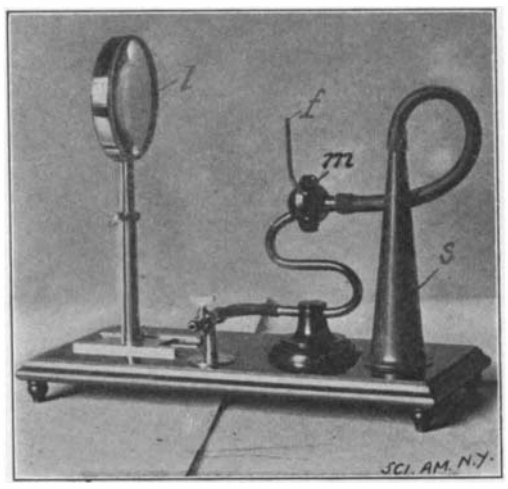

Fig. 1.—THE TRANSMITTER.

voice. In other words, as the light varies with the acoustic waves, the selenium cell is so affected as to cause the current flowing through its circuit to fluctuate, thus giving rise to vibrations of the diaphragm of the telephone receiver, which in turn produce acoustic vibrations.

In order to reproduce the sounds transmitted by the speaking light, the receiving apparatus shown in Fig. 2 is used. The vital part of this apparatus is a concave mirror of German silver; a selenium cell, *S;* a battery, *B;* a polarized relay, *R;* a signal-bell, *G;* and two telephone-receivers, *T*.

In experimenting with these two pieces of apparatus, the transmitter is so placed that the parallel pencils of light emerging from the condensing-lens are caused to fall upon the concave mirror of the receiver. Since the selenium cell, *S*, is mounted in the focus of this mirror, it will be influenced in the manner we have described. The relay will, therefore, be energized and

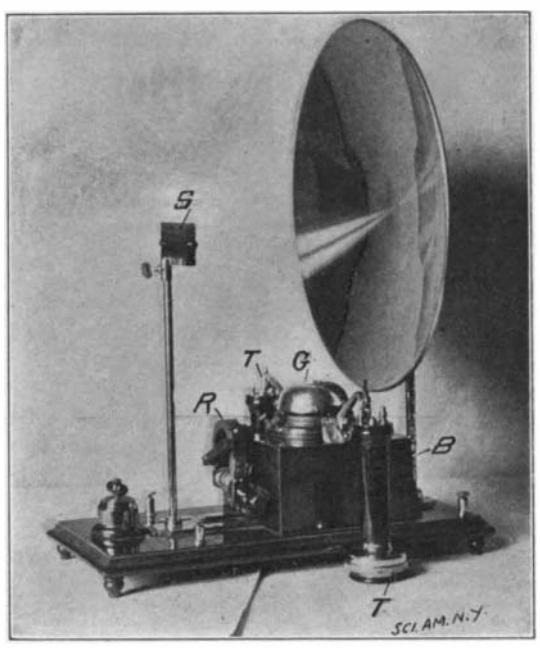

Fig. 2.—THE RECEIVER.

will influence the circuit of the bell, *G*, thereby giving a signal. The bell will ring only during the period in which the rays from the condensing lens fall upon the concave mirror, and will cease its ringing when the telephone receiver is removed from its hook, which occurs because a contact spring cuts out the bell and closes the telephone circuit. Every word that is spoken into the tube, *s*, of the transmitting apparatus can now be distinctly heard in the telephone-receiver. When the receivers are hung up, the transmitter is ready to send another message.

This set of apparatus is particularly well adapted for the demonstration of selenium telephony, whenever it is impossible to employ the Simon speaking-arc light. We are indebted to Messrs. Clausen & Von Bronk, Berlin, for our information.

Pets That Have Become Pests.

The farmers in the vicinity of Wilkesbarre, Pa., have reason to regret their kindheartedness. During the winter—which is said to have been colder even than the proverbial one which the old resident tells about—many sparrows and crows were either frozen or starved to death. Moved by this sad condition, many farmers fed the birds in the morning and evening. This charity, begun by a few, soon spread, until it became the fashion throughout the farming region to feed the birds. During the winter the promiscuous feeding of half-starved birds was a source of delight to children. Now there is a different tale to tell. So accustomed have the birds grown to the daily meals, free from all searching on their part, that they now fill the farmyards seeking food. Open barns are invaded, and wheat disappears in large quantities. The birds perch on the clotheslines on washing day, walk into the houses, and are now so tame that attempts to drive them away are not seriously taken. When spring planting begins more trouble may be expected. It looks as if some slaughter of the birds may be necessary.

Peculiar Currency.

The currency of Abyssinia is somewhat varied, to judge by an account given of it by Count Gleichen in his story of the mission to Menelik, and reprinted by Popular Science Monthly.

For standard money the people of Abyssinia use the Maria Theresa 1780 dollars, but for small change a very different coin is resorted to. This is no other than a bar of hard crystallized salt, about ten inches long and two and a half broad and thick, slightly tapering toward the end. Five of these bars go for a dollar at the capital.

People are very particular about the standard of fineness of the currency. If it does not ring like metal when struck with the finger-nail, or if it is cracked or chipped, they will not take it. It is a token of affection when friends meet to give each other a lick of their respective amolis, and in this way the value of the bar is decreased.

A New Comet.

Dr. William R. Brooks, Director of Smith Observatory and Professor of Astronomy at Hobart College, has discovered a new comet. The position of the comet at the time of discovery was right ascension, 22 h. 55 m. 40 s.; declination north, 29 deg. 12 min. From a telegram received at the Harvard College Observatory, a later observation gives the position, right ascension 23 h. 8 m. 10 s.; declination north, 27 deg. 25 min.; hence it follows that the comet has a daily motion in right ascension of +12 minutes, and in declination —2 degrees. The direction is southeasterly toward the sun. Amateur astronomers will find this comet in the northwest corner of the great square of Pegasus, traveling diagonally across the constellation. The Harvard description states that the comet is "brightish, with tail." Prof. Brooks now has a record of having discovered twenty-three comets.

The Current Supplement.

The leading article in the current Supplement, No. 1373, is an interesting description of a new Canadian iron and steel plant, which is illustrated by six half-tone engravings and which describes the most improved modern method of making steel. Airships just now are very much in evidence; for that reason an article by Mr. Stuart-Bruce on war-balloons, is timely. The automobile section of the Supplement is represented by an illustrated description of the recent Leipsic automobile show, as well as by a discussion of alcohol as a motive agent. Carroll D. Wright, who is probably the foremost American statistician, describes the working of the Department of Labor. Randolph I. Geare concludes his interesting illustrated serial article, "From Raft to Steamship," with a description of modern steam navigation. The consular notes and selected formulæ will be found in their usual places.

Santos-Dumont and Edison.

One of the first visits of Santos-Dumont was paid to Thomas A. Edison, at his Orange laboratory. According to the daily press, the chief topic discussed was the provision of a light motor for the young Brazilian's airship. Edison is said to have remarked that he never gave his attention to the airship, for the reason that it seemed to him of no commercial practicability as yet, and that he concerned himself only with inventions of commercial promise.

A Record-Breaking Week for the Patent Office.

The Official Gazette for April 29 breaks all records for the number of patents illustrated and claimed. The record has been held up to the present time by the issue of the Gazette for April 29, 1890, in which the number of patents shown was 618. By a singular coincidence, both of these remarkable issues bear the same monthly date. The new record is 700 patents.