Chemistry, Physics, Technology.

THE TELESTROSCOPE.

By M. Senlecq, of Ardres.

This apparatus, which is intended to transmit to a distance through a telegraphic wire pictures taken on the plate of a camera, was invented in the early part of 1377 by M. Senlecq, of Ardres. A description of the first specification submitted by M. Tenlecq to M. du Moncel, member of the Paris Academy of Sciences, appeared in all the Continental and American scientific journals. Since then the apparatus has everywhere occupied the attention of prominent electricians, who have striven to improve on it. Amongst these we may mention MM. Ayrton, Perry, Sawyer (of New York), Sargent, (of Philadelphia), Brown (of London), Carey (of Boston), Tighe (of Pittsburgh), and Graham Bell himself. Some experimenters have used many wires, bound together cablewise, others one wire only. The result has been on the one hand confusion of conductors beyond a certain distance, with the absolute impossibility of obtaining perfect insulation; and, on the other hand, an utter want of synchronism. The unequal and slow sensitiveness of the selenium likewise obstructed the proper working of the apparatus. Now, without a relative simplicity in the arrangement of the conducting wires intended to convey to a distance the electric current with its variations of intensity, without a perfect and rapid synchronism acting concurrently with the luminous impressions, so as to insure the simultaneous action of transmitter and receiver, without, in fine, an increased snsitiveness in the selenium, the idea of the telestroscope could not be realised. M. Senlocq has fortunately surmounted most of these main obstacles, and we give to-day a description of the latest apparatus he has contrived.

Transmitter.

A brass plate, A, whereon the rays of light impinge inside a camera, in their various forms and colours, from the external objects placed before the lens, the said plate being coated with selenium on the side intended to face the dark portion of the camera. This brass plate has its entire surface perforated with small holes as near to one another as practicable. These holes are filled with selenium, heated, and then cooled very slowly, so as to obtain the maximum sensitiveness. A small brass wire passes through the selenium in each hole, without, however, touching the plate, on to the rectangular and vertical ebonite plate, B, Fig. 1, from under this plate at point C. Thus every wire passing through plate A has its point of contact above the plate B lengthwise. With this view the wires are clustered together when leaving the camera, and thence stretched to their corresponding points of contact on plate B along line CC. The surface of brass A is in permanent contact with the positive pole of the battery (selenium). On each side of the plate B are let in two brass rails, D and T, whereon the slide hereinafter described works.

Rail E communicates with the line wire intended to conduct the various light and shade vibrations. Rail D is connected with the battery wire. Along F are a number of points of contact corresponding with these along CC. These contacts ought to work the apparatus, and to insure the perfect isochronism of the transmitter and receiver. These points of contact, though insulated one from the other on the surface of the plate, are all connected underneath with a wire coming from the positive pole of a special battery. This apparatus requires two batteries, as, in fact, do all autographic telegraphic—one for sending the current through the selenium, and one for working the receiver, etc. The different features of this important plate may, therefore, be summed up thus:—

D. Brass rail, grooved and connected with the line wire working the receiver.

F. Contacts connected underneath with a wire permanently connected with battery.

C. Contacts connected to insulate wires from selenium.

F. Brass rail. grooved, etc., like D.

Receiver.

A small slide, Fig. 2, having at one of its angles a very narrow piece of brass, separated in the middle by an insulating surface, used for setting the apearatus in rapid motion. This small slide has at the points D D a small groove fitting into the brass rails of plate B, Fig. 1, whereby it can keep parallel on the two brass rails D and E. Its insulator B, Fig. 2, corresponds to the insulating interval between F and C, Fig. 1.

A, Fig. 3, circular disc, suspended vertically (made of ebonite or other insulating material). This disc is fiked. All around the inside of its circumference are contacts connected underneath with the corresponding wires of the receiving apparatus. The wires coming from the seleniumised plate correspond symmetrically, one after the other, with the contacts of transmitter. They are connected in the like order with those of disc A, and with those of receiver, so that the wire bearing the No. 5 from the solenium will correspond identically with like contact No. 5 of receiver.

D, Fig. 4, guttapercha or vulcanite insulating plate, through which pass numerous very fine platinum wires, each corresponding at its point of contact with those on the circular disc A.

The receptive plate must be smaller than the plate whereon the light impinges. The design being thus reduced will be the more perfect from the dots formed by the passing currents being closer together.

B zinc or iron or glass plate connected to earth. It comes in contact with chemically-prepared paper, C, where the impression is to take place. It contributes to the impression by its contact with the chemically-prepared paper.

In E, Fig, 3, at the centre of the above-described fixed plate is a metallic axis with small handle. On this axis revolves brass wheel F, Fig. 5,

On handle E presses continually the spring H, Fig. 3, bringing the current coming from the selenium line. The cogged wheel in Fig. 5 has at a certain point of its circumference the sliding spring Fig. 5, intended to slide as the wheel revolves over the different contacts of disc A, Fig. 3.

This cogged wheel, Fig 5 is turned, as in the dial telegraphs, by a rod working in and out under the succesive movements of the electro-maguet H, and of the counter spring. By means of this rod (which must be of a non-metallic metallic material, so as not to divert the motive current), and of an elbow lever, this alternating movement is transmitted to a catch, G, which works up and down between the cogs, and answers the same purpose as the ordinary clock anchor.

This cogged wheel is worked by clockwork inclosed between two discs, and would rotate continuously were it not for the catch G working in and out of the cogs. Through this catch G the wheel is dependent on the movement of electro-magnet. This cogged wheel is a double one, consisting of two wheels coupled together, exactly similar one with the other, and so fixed that the cogs of the one correspond with the void between the cogs of the others. As the catch G moves down it frees a cog in first wheel, and both wheels begin to turn, but the second wheel is immediately checked by catch G, and the movement ceases. A catch again works the two wheels, turns half a cog, and so on. Each wheel contains as many cogs as there are contacts on transmitter disc, consequently as many as on circular disc A, Fig. 8, and on brass disc within camera. Having now described the several parts of the apparatus, let us see how it works. All the contacts correspond one with the other, both on the side of selenium current and that of the motive current. Let us suppose that the slide of transmitter is on contact No. 10, for instance, the selenium current starting from No. 10 reaches contact 10 of rectangular transmitter, half the slide bearing on thip point, as also on the parallel rail, communicates the current to said rail, thence to line, from the line to axis of cogged wheel, from axis to contact 10 of circular fixed disc, and thence to contact 10 of receiver. At each selenium contact of the rectangular disc there is a corresponding contact to the battery and electro-magnet. Now, on reaching contact 10 the intermission of the current has turned the wheel 10 cogs, and so brought the small contact O, Fig. 5, on No. 10 of the fixed circular disc.

As may be seen, the synchronism of the apparatus cuuld not be obtained in a more simple and complete mode—the rectangular transmitter being placed vertically, and the slide being of a certain weight to its fall from the first point of contact sufficient to carry it rapidly over the whole length of the transmitter.

The picture is, therefore, reproduced almost instantaneously; indeed by using platinum wires on the receiver connected with the negative pole by the incandescence of the wires according to the different degrees of electricity we can obtain a picture, of a fugitive kind, it is true, but yet so vivid that the impression on the retina does not fade during the relatively very brief space of time the slide occupies in travelling over all the contacts. A Rhumkorff coil may also be employed for obtaining sparks in proportion to the current emitted. The apparatus is regulated in precisely the same way as dial telegraphs, starting always from first contact. The slide, should, therefore, never be removed from the rectangular disc whereon it is held by the grooves in