The Letter "E" as Sent

The Transmission of

French and German Scientists Make Remarkable Progress in Sending of Images—Success Assured by Brilliant Beginning—Many Wonderful Possibilities Opened Up by New Art

"HELLO, John, you're looking well today," is the morning salutation a man in New York may make to his friend in Chicago over the television-telephone within a few years.

And that will be no joke either.

For the possibility of being able to see the person with whom you are talking on the long-distance telephone is no idle dream. It has passed the stage of a Jules Verne prophecy, for while the famous French author conceived wonderful inventions in his fertile imagination, science has actually made a brilliant beginning in the transmission of vision, and it is already with us.

The realization of the process as one of the useful arts is but a matter of continued development. A few attempts have already been made at sending photographs over the wire, and while the result has not been all that could be wished, has served to demonstrate the practicability of the process. A vista of wonderful possibilities is opened by the advances made in television and photo-telegraphy. And it must be kept in mind that there is a radical difference between the two systems. While television aims to transmit either photographs or living images, the other is meant to send photographs only.

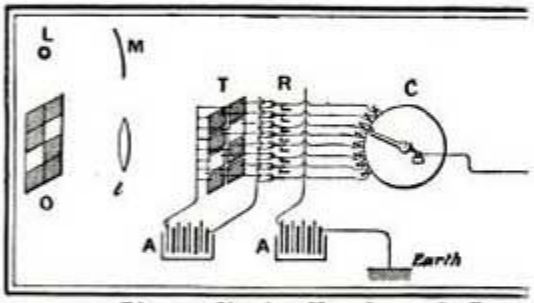
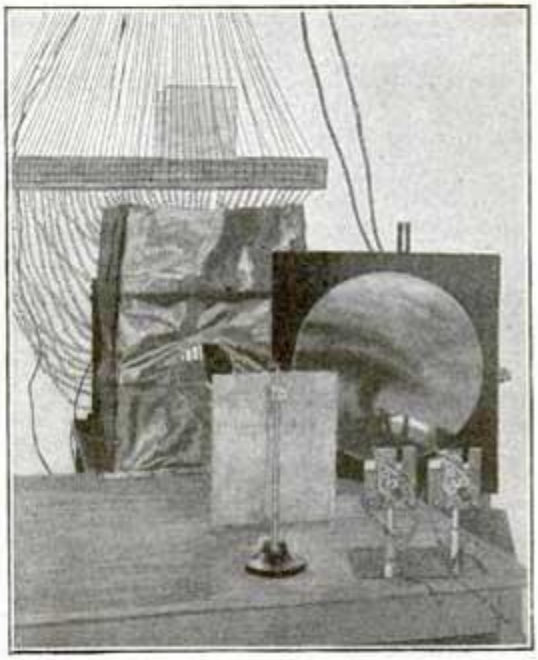


Diagram Showing How Image Is Trans-



The Apparatus Used at the Transmitting End, Showing the Round Mirror, Lamps, Object Attached to Stand, and the Lens Which Projects Image of Object onto Selenium Frame, Which Is Covered.

In Europe a new international figure springs into fame in a day. Simultaneously with the appearance of the news in the daily papers of the United States his photograph is published. The cable which bears the dispatch telling the story may be used to transmit the man's image. Or it may yet come by wireless.

A crime has been committed. Quick action on the part of the police of the entire country is necessary to apprehend the perpetrator. Within a few hours his photograph is in the hands of the police of San Francisco as well as New York, and his chances of escape are small. Just as the great press as-

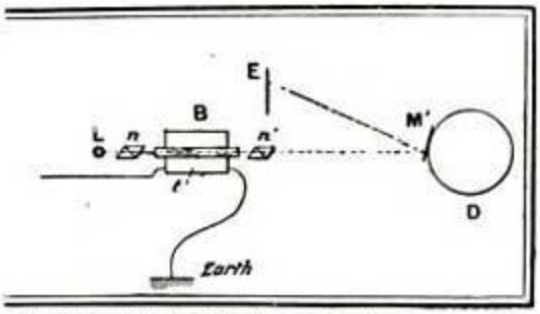
Vision by Electricity

Selenium, an Element Which Conducts Electricity Only When Subjected to Light, the Secret of Discoveries—Shades Translated into Currents and Back to Shades

The Letter "E" as Received

sociations now distribute the news of the world they may furnish the daily papers with photographs.

The idea of transmitting vision has attracted scientists for years and in many countries they are striving to solve the problem. Earnest Ruhmer, a distinguished electrician of Berlin, has been working on it for a long time and has perfected a system which he



mitted from Sending Station to Receiver

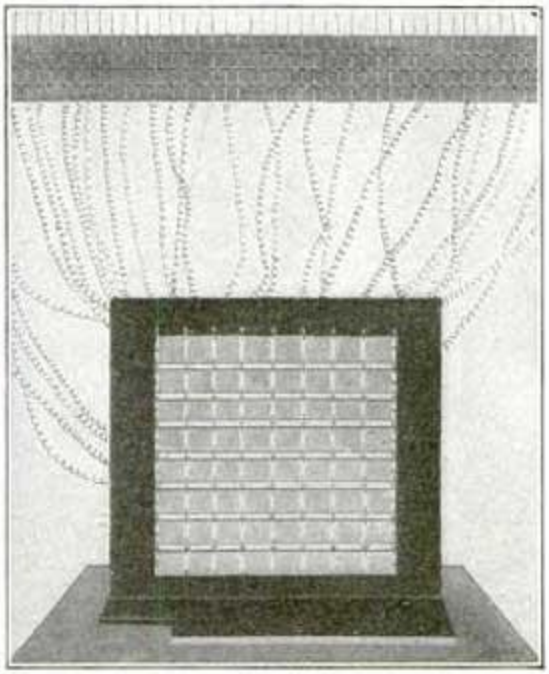
will exhibit at Brussels this year. Working along almost identical lines are George Rignoux and M. A. Fournier, of France.

The secret of both efforts rests in the almost human powers of selenium, a nonmetallic element, analogous to sulphur in its compounds. It offers a very feeble resistance to electric currents if it is subjected to light, a powerful resistance if not lighted, and degrees of resistance corresponding with the degrees of light.

The element which plays such an all-important part in the new art was discovered by Johann Berzelius, a renowned Swedish chemist, in 1817. To him we are also indebted for the discovery of thorium and cerium as well as for many of the analytical processes now in use. Though not very abundant in nature, the element enters into the composition of many minerals and has been found in the free state in certain parts of Mexico.

Rignoux and Fournier have two sets of instruments. The first is for demonstration only, establishing the principle, but having too many wires to be practical. The second has two wires only, one for the varying currents carrying the image of the object sent, and the other to regulate the operation of the instruments of both ends.

Stripped of the maze of technical terms in which such an intricate electro-chemical process is generally enmeshed it may be described as a method by which the varying shades of a black and white object may be taken, piece by piece, and transmitted by means of currents corresponding in



The Frame with Selenium Cells, Wires Connecting with Each Cell

strength with their shades to a receiver which retranslates the currents back to the shades and places them in their original positions.

The diagram in the center of the page will aid in a better understanding of the process. At the transmitting station is a frame provided with cells of selenium. By means of a strong light (L), a mirror (M), and a lens (l), the image of the object (O) is projected on the selenium cell frame (T). The cells on which the light falls permit a current of electricity to pass, but the cells which are not lighted by the projected image resist the passage of electricity and there is no current.

Each cell is connected with a wire. A collector, (C) receives each wire in a separate confine. On the inside a wheel turns very rapidly, gathering the currents of the wires in turn and transmitting them over the single wire connecting the sending and receiving instruments. This wire is thus incessantly traveled by many variations of current. The problem is to collect them as fast as they are shot over the wire, transform the currents to shades of black and white, and put them in their respective places in relation to the whole object, transforming them from electrical to luminous vibrations.

Rignoux and Fournier accomplish this in the following manner:

At the receiving station there is a luminous source (L), the rays of which are polarized by the prism of a Nicol polarizer (n), pass through a tube of carbonate of sulphur (t), placed in the middle of a bobbin for rotatory magnetic polarization (B), and a prism analyzer (n'). The light is more or less abundant in proportion to the current, which at that moment comes over the wire to the bobbin. These luminous vibrations are received upon a disc with mirrors (D), the rotation of which is regulated to coincide with the rotation of the collector at the transmitting station by means of the special wire. This gives to the mirrors (M') certain positions in order that each luminous vibration may be reflected in its turn in correct position upon the screen (E).

The currents are received, one after another, in rapid succession, and placed until the entire image of the object sent has been again set up.

With such a beginning it is only necessary to increase the number of selenium cells in the frame until there are thousands of them, so that the transmission of the image of a person standing in front of the instrument will be possible. Once the process has reached such a stage of development the transmission of color may follow just as color photography has evolved from its mother art.

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