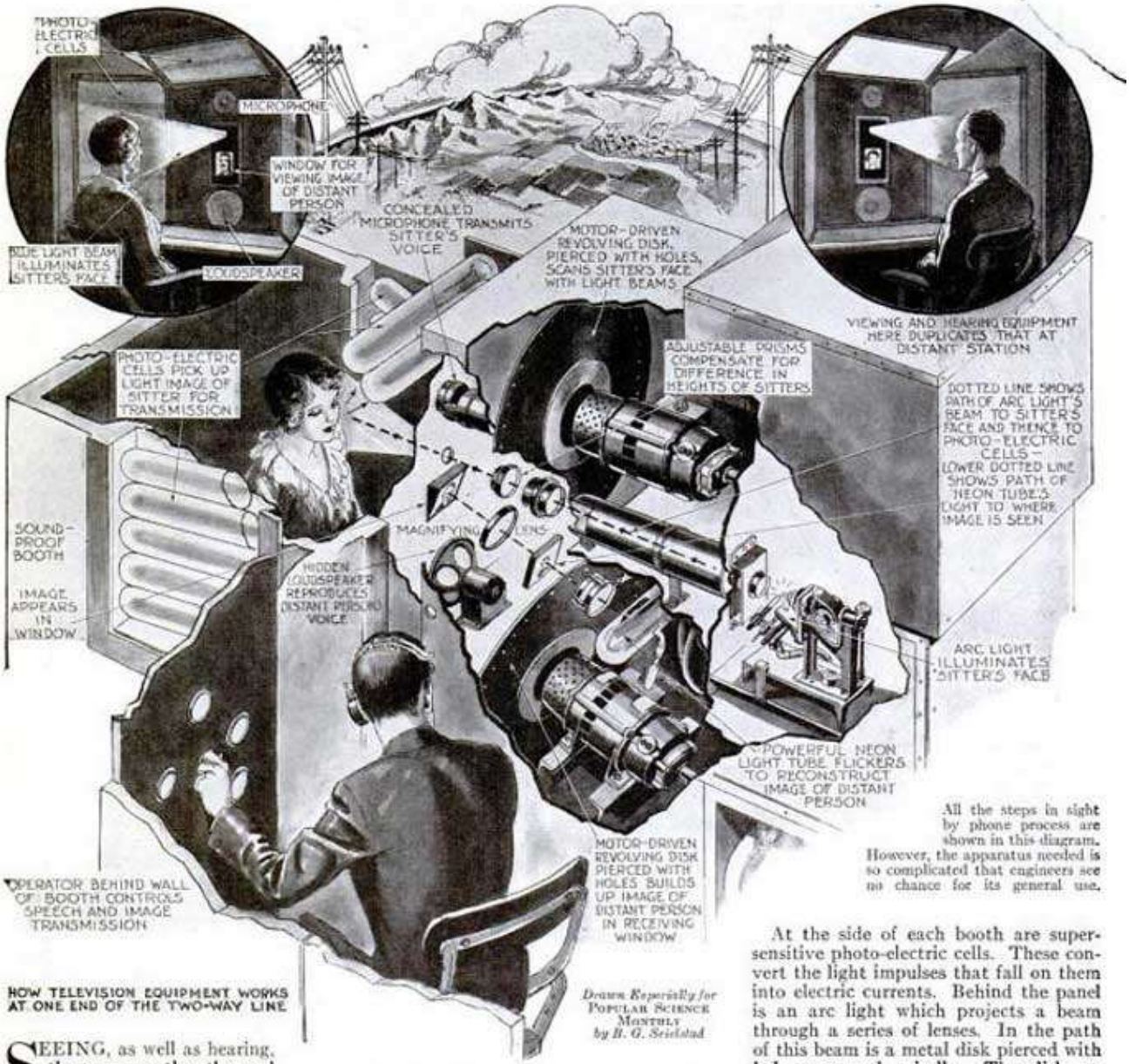
Talk, Hear, SEE on This Phone

Two-Way Television Is Demonstrated in Laboratory As an Engineering Stunt



All the steps in sight by phone process are shown in this diagram. However, the apparatus needed is so complicated that engineers see no chance for its general use.

HOW TELEVISION EQUIPMENT WORKS AT ONE END OF THE TWO-WAY LINE

Drawn Especially for POPULAR SCIENCE MONTHLY *by B. G. Seielstad*

SEEING, as well as hearing, the person on the other end of the phone line has been accomplished in the laboratory. Two-way phone television was demonstrated recently by the Bell Telephone Laboratories in New York City with the aid of complicated and expensive apparatus.

Engineers, however, hold out no hope at present of improving the television apparatus to the point where sight and hearing will be possible in ordinary telephone conversations.

Our artist shows above how two-way television is accomplished. Each of the "parties" sits in a specially prepared booth. Directly in front of each is a panel, at the top of which is a special microphone. Below that is an opening through which comes the beam of light used to "analyze" the face for the television. Below this opening is a small ground glass screen on which appears the image of the "party" at the other end of the line, and at the bottom of the panel is a loudspeaker. The microphone at the top and the loudspeaker at the bottom take the place of the ordinary telephone, which cannot be used because it would hide part of the talker's face.

At the side of each booth are supersensitive photo-electric cells. These convert the light impulses that fall on them into electric currents. Behind the panel is an arc light which projects a beam through a series of lenses. In the path of this beam is a metal disk pierced with holes arranged spirally. The disk revolves eighteen times a second and each hole permits a tiny beam of light to sweep across a different portion of the sitter's face.

This light, when reflected by the beam from the sitter's face to the photo-electric cells, varies to conform with the lights and shadows of the face. The result is a rapidly pulsating current. This current is carried by wire to the receiving apparatus at the other end of the line where, after amplification, it is transformed from electrical vibrations to corresponding

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light flickerings in a powerful neon-filled tube.

In front of the neon tube is a disk that duplicates the transmitting scanning disk both in number and arrangement of holes and in speed of rotation. The flickering light beams passing through the holes in the receiving or "scanning" disk build up a complete image eighteen times a second. It is as if a continuous string of rapidly moving pencils passed by the vision screen and each one drew a single horizontal slice of the picture. The detail or sharpness of the image depends on the number of holes that make up the spiral of the disk and the speed at which the disk rotates. In the two-way demonstration the disk rotates rapidly enough to produce a detail about equivalent to that of a rough newspaper picture. The super-sensitive photo-electric cells make it possible to use a relatively weak beam of light for scanning; which is, of course, less annoying to the sitter than the intense light previously used.

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