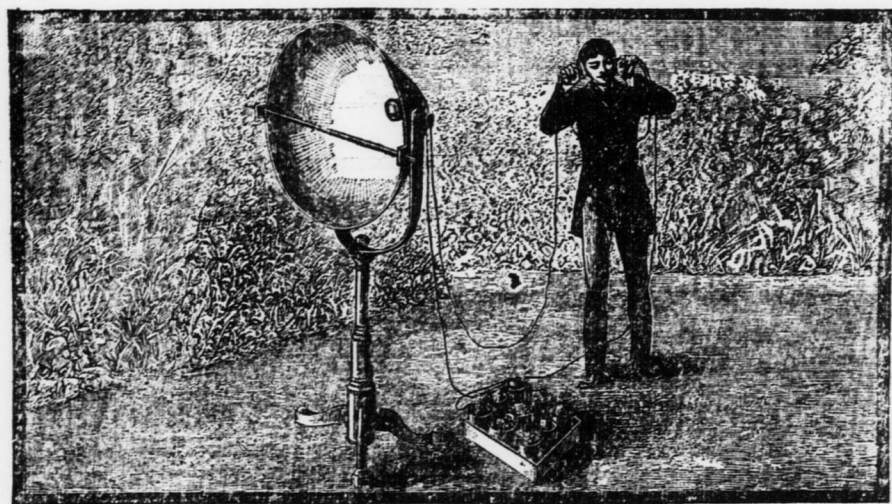


ALEXANDER GRAHAM BELL FIRST TO TELEPHONE BY LIGHT WAVES



Reproduction of Old Print Showing Apparatus Used in Projecting Sound by Beam of Light.

By J. O. PERRINE

Today, the Old and New Worlds talk to one another by means of the transatlantic telephone. Carried by electric waves first predicted by Maxwell, an Englishman, and experimentally verified by Herz, a German, speech travels the broad expanse of the Atlantic Ocean in one-sixtieth of a second. These electric waves, commonly known as radio waves, were known and understood by relatively few scientists in 1876 when the telephone was invented. Of course, light waves were known. Using these light waves, Alexander Graham Bell was the first to devise a wireless telephone.

Bell Describes Test

In 1880, he published an article entitled "On the Projection of Sound by Light." After describing his invention he said:

"We can thus, without a conducting wire, as in electric telephony, speak from station to station wherever we can project a beam of light. We have not had opportunity of testing the limit to which this telephonic influence can be extended, but we have spoken to and from points 700 feet apart, and there seems to be no reason to doubt that the result will be obtained at whatever distance a beam of light can be flashed from one observer to another.

"Dr. Tainter (his assistant) operated the transmitting instrument, which was placed on the top of Franklin Schoolhouse in Washington, and the sensitive receiver was arranged in one of the windows of my laboratory, 1325 L street, at a distance of 700 feet. Upon placing my telephone to the ear, I heard distinctly from the illuminated receiver the words, 'Mr. Bell, if you hear what I say come to the window and wave your hat.'"

In March, 1881, Bell went to England, and at a grand reception held in his honor at Brantford he spoke of his successful experiments of the year before. The following is an excerpt from a reporter's account of the occasion:

"Bell described his recent discovery of the photophone as at present rather a contribution to science than to the world's utilities, but he looked forward to important practical applications. Among them he specified communication between

passing ships at sea, light-houses on the shore, and in case of war, communication with distant places could be received without the necessity of an intervening wire. He then described the apparatus and experiments, and added that he had spoken from a distance of 800 or 900 yards, and had sent the musical sound a mile and a quarter, but he saw no reason to anticipate any difficulty but that of the convexity of the earth in transmitting articulate speech by light to any distance."

Light Waves and Radio Waves Are Alike

We know that light waves differ from radio waves in being very, very much shorter, but they are actually the same kind of waves. Our eyes have receiving systems to detect light waves but do not detect the longer waves generally known as radio waves. The instrumentalities employed today to talk by means of electric waves across the Atlantic were not only unknown in 1880 but undreamed of. The longer waves, fortunately, are not hindered, as are light waves, by the convexity of the earth in transmitting speech even all the way around the world.

Communication by telephone between passing ships at sea, light-houses and the shore and between continents separated by oceans is now an established fact. Bell was the first to devise a wireless telephone and successfully talk through it. To be sure, the transmitting apparatus was not that which is now used nor was the receiving apparatus that which is now used, but it is interesting to realize that electro-magnetic waves were the carrier in both cases.

Guided and Unguided Waves

Electro-magnetic waves, those guided by wires and those which spread out in space, were first made to carry man's messages by Alexander Graham Bell. On every hand these waves are employed in the communication services of the world. Wire telephony, with its thousands of central offices, its switchboards and millions of miles of wire, envelops the country and carries for the American people alone over 75,000,000 conversations every day. Wireless telephony is broadcasting entertainment and carrying important information to millions of listeners. The transatlantic radio telephone unites two worlds.



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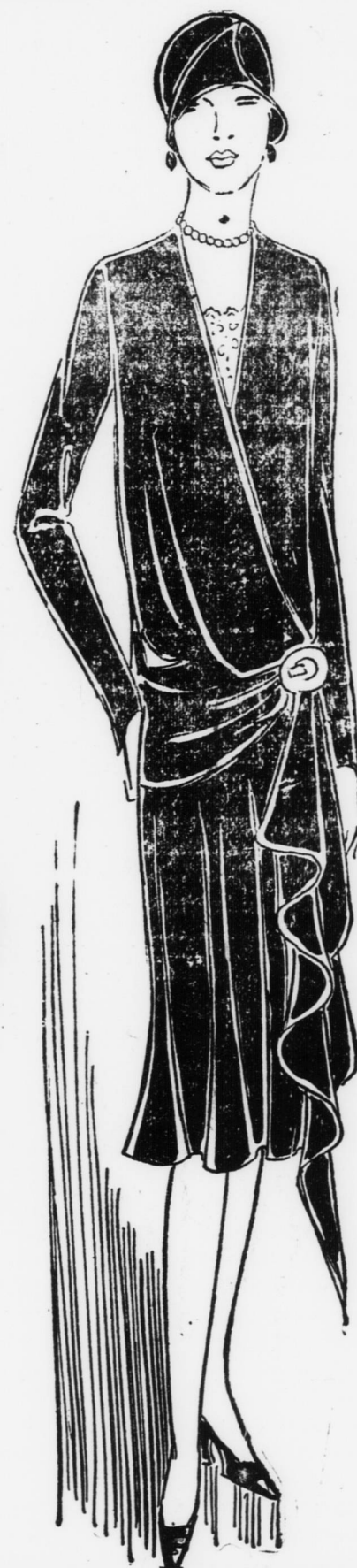
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