

(No Model.)

S. P. THOMPSON & P. JOLIN.

TELEPHONE TRANSMITTER.

No. 339,499.

Patented Apr. 6, 1886.

Fig. 2,

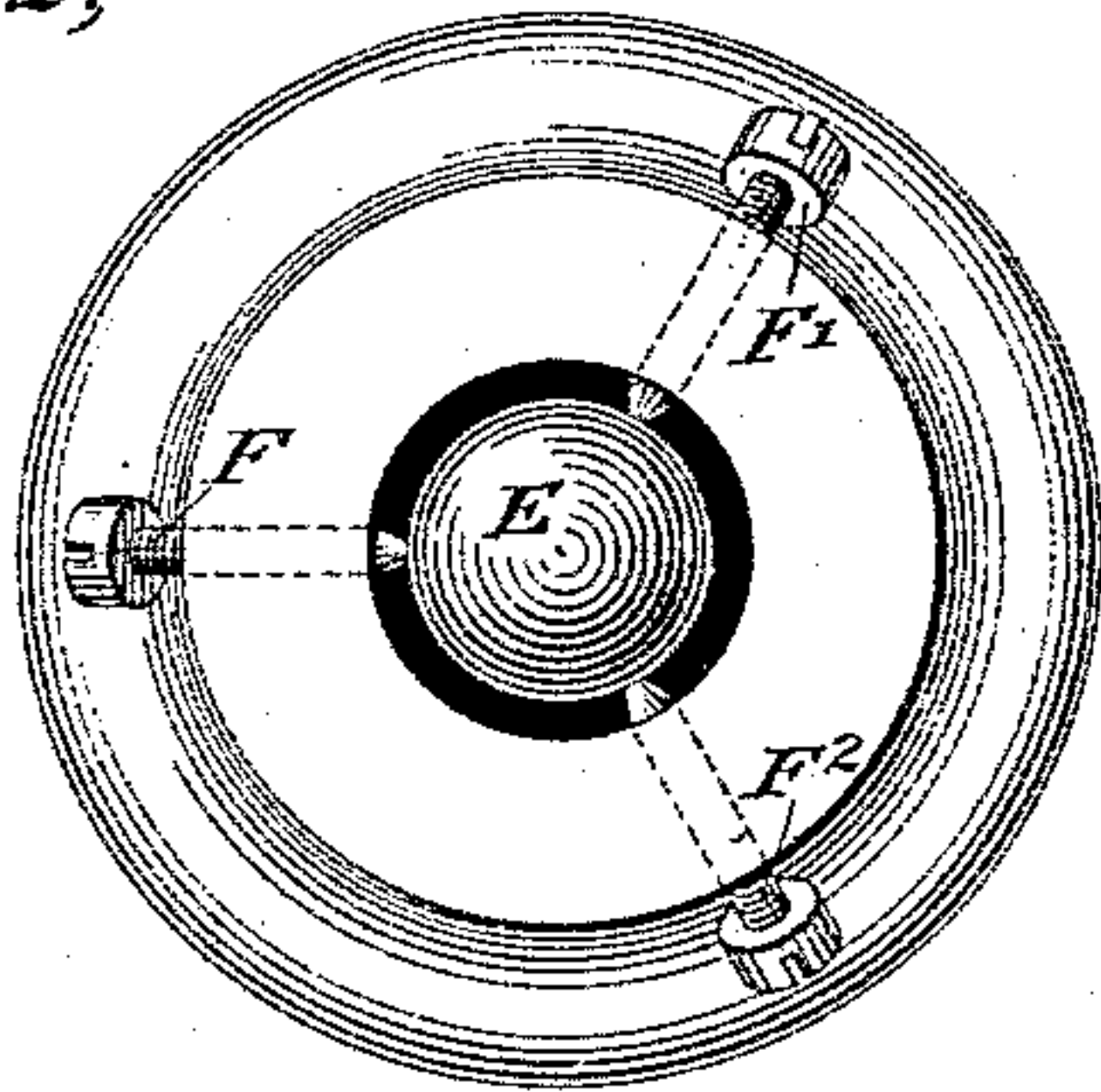
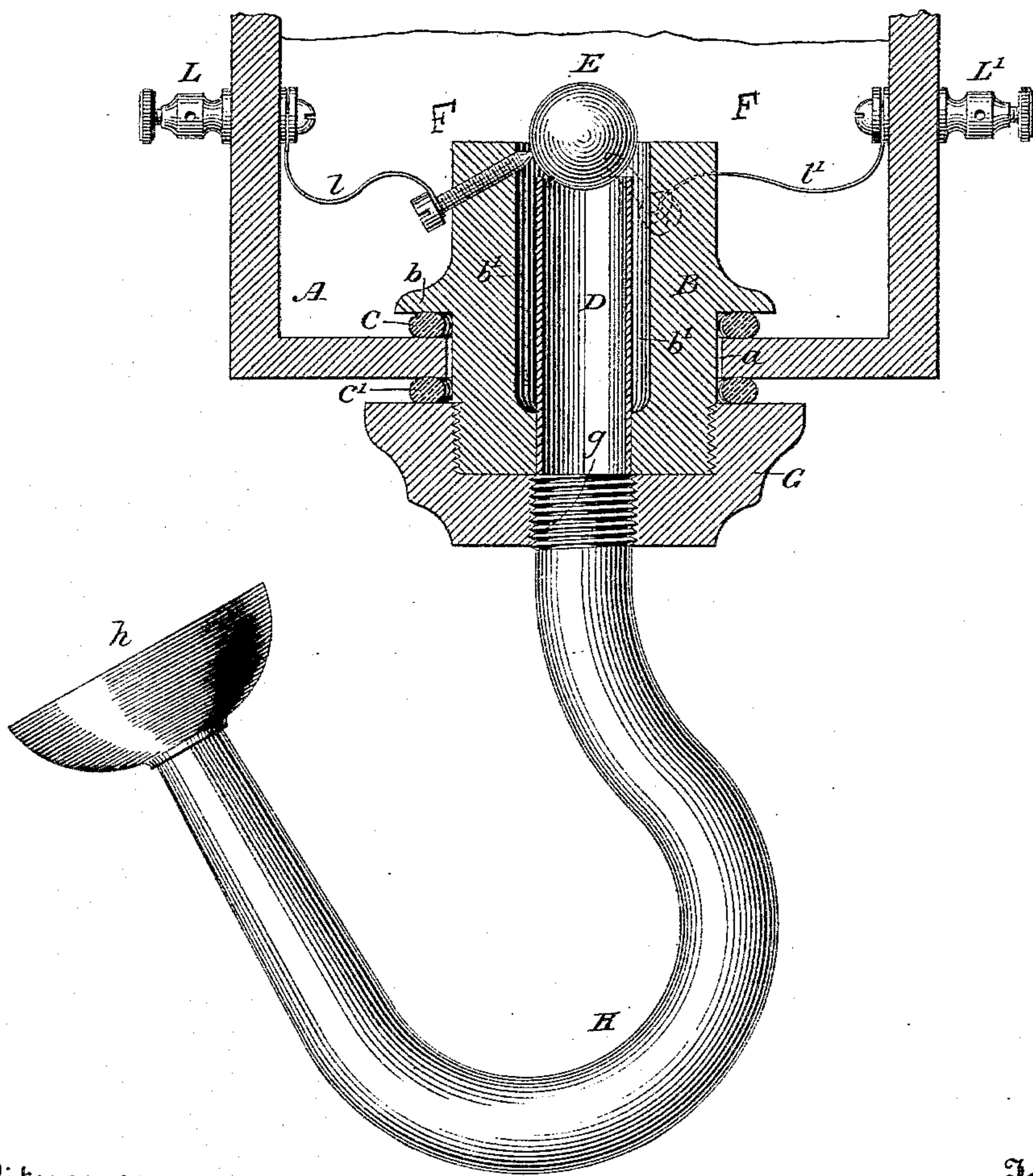


Fig. 1,



Witnesses

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TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 339,499, dated April 6, 1886.

Application filed November 22, 1884. Serial No. 148,605. (No model.) Patented in England June 3, 1884, No. 8,524, and in Germany November 28, 1884, No. 32,278.

To all whom it may concern:

Be it known that we, SILVANUS PHILLIPS THOMPSON and PHILIP JOLIN, subjects of the Queen of Great Britain, both residing in the city of Bristol, and county of Gloucester, England, have invented certain new and useful Improvements in Transmitters for Electric Telephones, (for which we have received Letters Patent of Great Britain, No. 8,524, of 1884,) of which the following is a specification.

In most of the forms of telephonic transmitters hitherto in use one or both of the electrodes have been attached either to springs or to a tympanum or diaphragm, or to some attachment capable of taking up rhythmical vibrations imparted by means of a tympanum or diaphragm. Our invention differs essentially from these in that the movable portion of the electrodes or conductors is constructed in the form of a valve. For example, one of the electrodes or contact-pieces may constitute the valve-seat and the other the ball, plug, flap, or other movable portion of the valve, resting under normal conditions upon its seat, and so arranged that atmospheric vibrations or sound-waves produced by the human voice or otherwise tend to raise or open the valve by automatically lifting the ball, plug, flap, or other movable portion more or less completely from its seat and letting it fall again.

In a Patent issued May 20, 1884, No. 299,073, there is described an apparatus operated in somewhat the manner described above; but in this several contact balls or spheres rest against the confronting edges of two sections of a diaphragm. By our invention only one sphere is required, and this, instead of resting against the edges of a diaphragm, is supported directly above the end of the speaking-tube by contact-pins and receives the full force of the air-waves.

The accompanying drawings represent one form of apparatus embodying our invention, in which Figure 1 is a vertical transverse section of the apparatus, and Fig. 2 is a plan view of one portion of the same.

Referring to Fig. 1, A is a box or case, which serves to support or protect the working parts of the apparatus.

B is a cylindrical block, preferably of wood

or other non-conducting material, which is provided about midway of its length with a projecting flange, *b*. The lower portion of the cylindrical block B passes, without touching, through a circular aperture, *a*, formed in the bottom of the box or case A. The block B is supported and maintained in its position by two annular rings, C and C', of india-rubber or other equivalent dampening material, which encircle said block and prevent vibration of the box or case from affecting the working parts.

D is a hollow tube, of brass or other suitable metal, which is situated within a cylindrical cavity, *b'*, extending in a vertical direction axially through the block B. The lower portion of the cylindrical cavity *b'* is of such diameter that the metallic tube D fits closely within it, as shown in Fig. 1; but the upper portion of the same cavity is preferably of greater diameter, so as to leave an annular air-space between the tube D and the inner surface of the block B. The tube D is of such length that its upper end is somewhat below the upper end of the block B, which encircles it, as shown in Fig. 1.

Above the upper end of the tube D there is placed a valve, E, which valve is preferably a hollow spherical mass of some suitable metal or metalloid or alloy, preferably of phosphor bronze, silicium bronze, selenium bronze, or sulphur bronze.

Three pins, F, F', and F², are inserted in the upper portion of the block B, and bear against the sphere or ball E at three equidistant points in a horizontal plane, cutting the said sphere at a point below its center. Two of these pins, F and F', are preferably tipped with gold, platinum, iridium, or other suitable metal or conducting material; but such provision is not necessary in case the third pin, F², is not used as an electrode, in which case it does not form a portion of the electric circuit, as hereinafter explained. These contact-pins may be made, if preferred, adjustable, by having a screw-thread cut upon them.

Upon the lower end of the block B is screwed or otherwise secured an annular cap, G, provided with a central opening, *g*, into

which is inserted the end of a speaking-tube, H, which may be provided with a suitable mouth-piece, *h*. The tube H may be either rigid or flexible, and may be of any convenient length.

As it is desirable to maintain the apparatus hereinbefore described in an upright position, and to have the speaking-tube enter from beneath, it is preferable to construct it with a curve similar to that shown in Fig. 1, for greater convenience of use.

The electric circuit enters at the binding-screw L and passes by the wire *l* to the platinum-tipped contact-pin F, thence through the ball or valve E, and to the platinum-tipped contact-pin F', and thence through the wire *l'* to the binding-screw L'.

The transmitter thus constructed may be used in the ordinary manner, it being usually preferable to include the same, together with a suitable battery, in the primary circuit of an induction-coil at the transmitting-station. The secondary circuit of the same coil is continuous with the line extending to the distant station, at which point any suitable receiving-telephone may be included in the circuit.

In order to arrange the apparatus for operation as a telephonic transmitter, the pins F, F', and F'' should be set up against the ball E sufficiently to nearly or quite raise it from contact with the upper end of the tube D. The electric circuit will then uninterruptedly traverse the ball or valve E and two of its three supports. In some cases the current enters by two of the three pins and leaves by the third pin, or vice versa. If, now, a person speaks into the speaking-tube H, for example, the atmospheric sound-waves are conducted by said tubes through the opening G into the tube D, and thus impinge directly against the lower surface of the ball E, tending to raise it more or less from its seat or from the points of the contact-pins F and F', thereby giving rise to fluctuations or variations in the strength of the electric current passing therethrough, which fluctuations, acting through the medium of a suitable telephonic receiving-instrument, reproduce in a well-known manner the sound-waves which originally acted upon the transmitting apparatus.

In our transmitter it is not essential that the valve should be entirely closed when in its normal position, and in some cases apertures may be expressly provided, in order to prevent the valve when resting upon its seat from absolutely closing the air-passages. The sound vibrations or waves traversing the atmosphere are made to impinge upon the valve, and they may strike either upon its upper or upon its lower surface or upon both surfaces.

When it is desired to make the air-waves produce a more powerful mechanical effect upon the valve, they may be concentrated upon it by means of a speaking-tube or other suitable mouth-piece.

The electrodes or contact-pieces of the valve-seats may be formed of any sufficiently good electric conducting material of the kinds usually employed for the making of microphones or telephonic transmitters—as, for example, of any non-metallic conducting substance, such as coke—which can be made up in the shape of a clack, plug, ball, frustum of a cone, zone of a sphere, or other suitable form for a valve of the ordinary kind. The valve may in some cases be made of wood or other non-conducting material, and the electrodes or contact-pieces are placed at the top or side of it, so that when the air-waves tend to open the valve to a greater or lesser degree the valve in turn, by the motion which it imparts to the electrodes or contact-pieces, tends to increase to a corresponding degree the resistance of the electric circuit, and thereby affects the quantity of electric current which flows through the electrodes.

In order to prevent undue sparking when strong currents are to be transmitted, several valves may be used, each consisting of a ball, plug, clack, or other suitable piece resting upon its own seat and serving as an electrode or as a means of actuating separate electrodes or contact-pieces. The sound-waves in this case will act simultaneously upon the several valves, which, since each of them receives a part of the current, simultaneously act upon their own part of the current and set up in it the requisite fluctuations, corresponding to the opening of the valves to a greater or lesser degree by the air-waves.

We claim as our invention—

1. A telephonic transmitter consisting of the combination, substantially as hereinbefore set forth, of a speaking-tube, a spherical valve partially closing the same, and one or more contact-pins supporting said valve.

2. The combination, substantially as hereinbefore set forth, with a speaking-tube, of a spherical conducting-valve, adjustable contact-pins supporting said valve at the end of said tube, and means for completing an electric circuit from said pins through said valve.

In testimony whereof we have hereunto subscribed our names this 6th day of November, A. D. 1884.

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Witnesses:

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