2 Sheets—Sheet 1.

W. GILLETT.

Speaking Telephone.

No. 232,705. **Patented Sept. 28, 1880.**

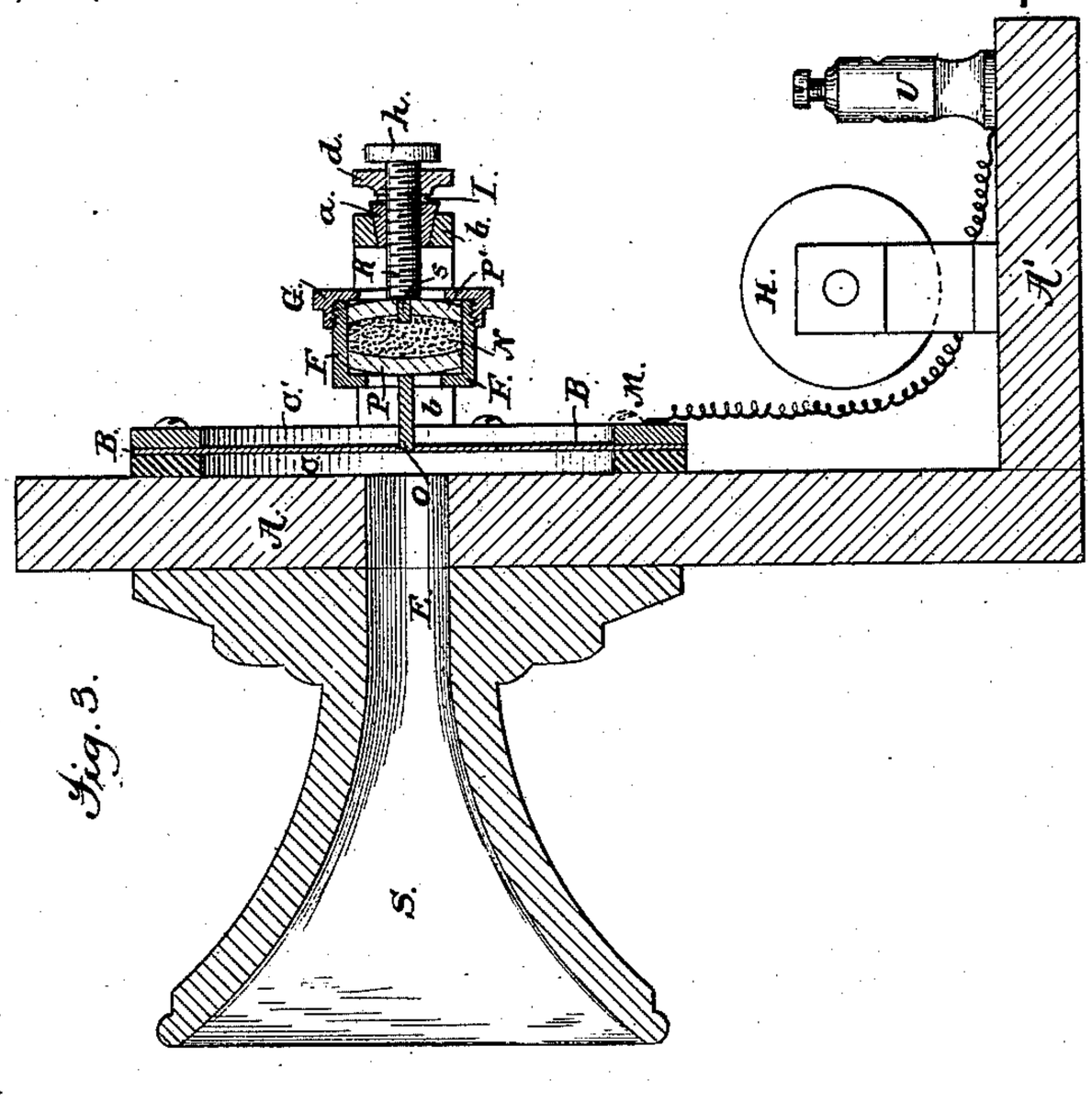

Fig. 3.

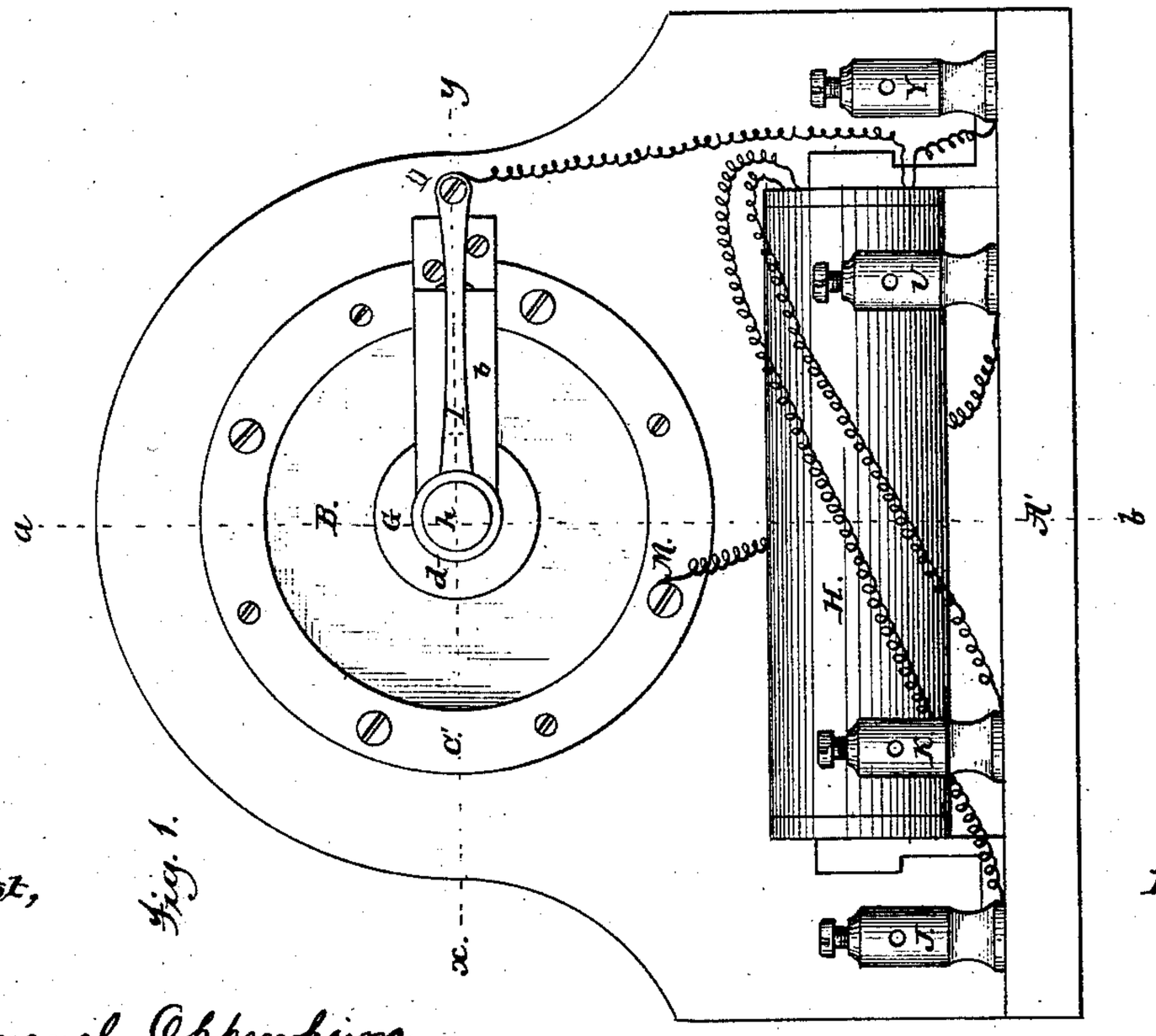

Fig. 1.

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Samuel Oppenheim
Daniel P. Thompson

Inventor,

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2 Sheets—Sheet 2.

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Fig. 1.

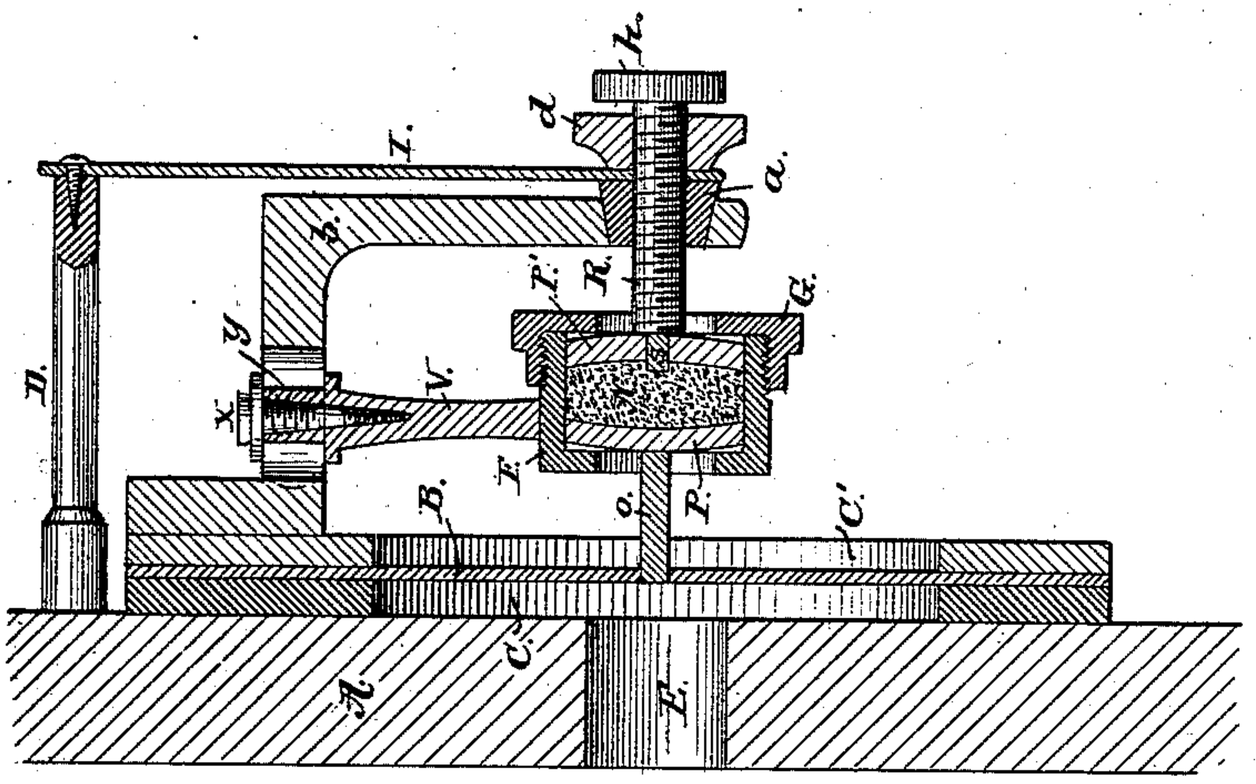
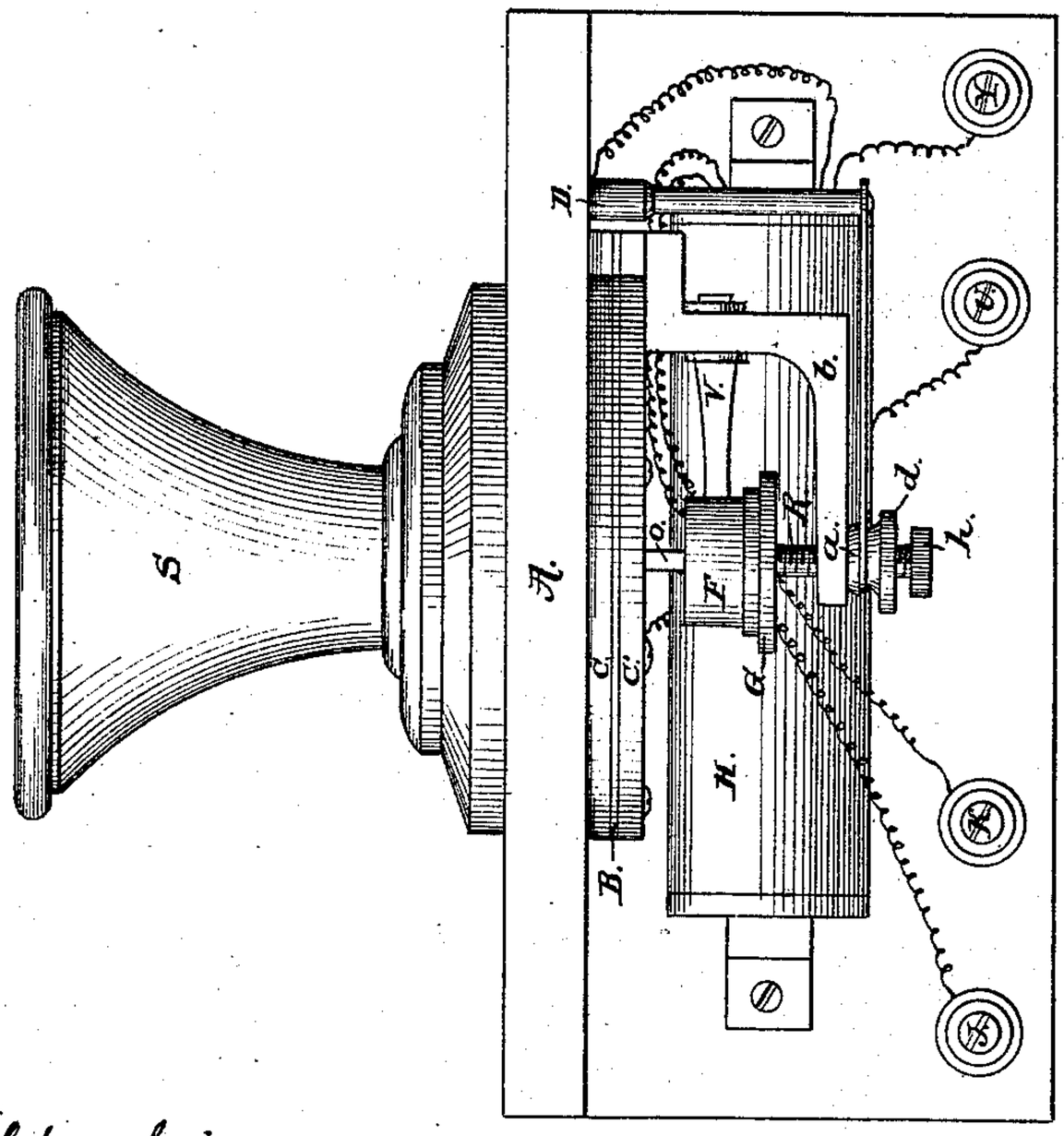


Fig. 2.



Attest,
Samuel Oppenheim
Daniel G. Thompson

Inventor,
Webster Gillett

UNITED STATES PATENT OFFICE.

WEBSTER GILLETT, OF YPSILANTI, MICHIGAN, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO RICHARD SCHERMERHORN, OF BROOKLYN, N. Y.

SPEAKING-TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 232,705, dated September 28, 1880.

Application filed December 9, 1879.

To all whom it may concern:

Be it known that I, WEBSTER GILLETT, of Ypsilanti, in the county of Washtenaw and State of Michigan, have invented certain new and useful Improvements in Speaking-Telephones; and I do hereby declare that the following is a full, clear, and complete description thereof, reference being had to the accompanying drawings, which are made a part hereof.

Figure 1 is an elevation; Fig. 2, a plan; Fig. 3, a transverse vertical section through the dotted line *a b*, Fig. 1; and Fig. 4 is a horizontal section through the dotted line *x y*, Fig. 1.

My invention consists in an adjustable cylinder containing the low conductor, so combined with independent adjusting devices that the point of contact is forced by the acoustic influence into the deepest desirable position in the low conductor, whereby is obtained, first, the most perfect conducting medium; second, six deviations of the electric current; and, third, the generation of a current of electricity upon the secondary wire of the induction-coil.

Like letters of reference designate corresponding parts in all of the figures of the drawings.

C and C′ are metallic rings; B, a vibratory plate; A and A′, a frame; S, a mouth-piece; E, an opening in the mouth-piece to admit of acoustic action on the vibratory plate, and H an induction-coil.

In Figs. 1 and 2, J, K, U, and Y represent the binding-posts. The metallic rings C and C′ confine between them the vibratory plate B, and are screwed to the frame A and A′ opposite the mouth-piece opening E. The angle-piece *b* is securely fastened to the metallic plates C and C′, and it supports the arm V, which has a lateral adjustment effected by the slot *y* and set-screw *x*. The arm V is directly connected with and supports the flanged cylinder F in front of the vibratory plate B.

P and P′ represent disks of pliable elastic material, and N a stratum of granulated carbon or equivalent low electric conductor, confined between them in the adjustable cylinder F; and G is a flanged screw-cap to screw upon the cylinder F for compressing the edges of the disks P and P′ between its flange and the flange of the cylinder F, and thereby holding the low conductor N in an oblate form to increase its conductive capacity and to secure results hereinafter specified.

O is a metallic bar, which is securely fastened to the vibratory plate B and abuts against the disk P within the adjustable cylinder F, adjusted relatively to the vibratory plate B by moving the arm V in the lateral slot *y*.

R is an adjustable compression-screw, which passes through the angle-piece *b*, and is insulated therefrom by the insulator *a*, and abuts with a shoulder against the pliable elastic disk P′. This compression-screw R is provided with a milled head, *h*, and a metallic pin, *s*, which penetrates the disk P′ and makes contact with the poor electric conductor N.

D, Figs. 2 and 4, is a metallic post secured to the frame A, and I is a metallic strap connecting the post D with the compression-screw R, which is provided with a jam-nut, *d*.

By increasing or diminishing the compression upon the poor electric conductor N its conductive capacity will be increased or diminished. This is accomplished, as shown in Figs. 3 and 4, by means of the screw-compression cap G, in combination with the elastic disks P and P′, by the compression-screw R, and by the lateral adjustment of the cylinder F through its arm V in respect to the vibratory plate B and bar O.

Upon connecting the primary wire of the induction-coil H with post D, binding-post Y, and the screw M of the metallic ring C′, and with the binding-post U, as shown in Figs. 1 and 2, the electric influence of the positive pole of a battery, from the binding-post Y, passes through the induction-coil to the post D; thence through the strap I, screw R, pin S, strata N, cylinder F, arm V, angle-piece *b*, ring C′; thence through the wire from the screw M to the binding-post U, making connection with the opposite pole of the battery, and thus forming a circuit through the low electric conductor N. The secondary wire of the induction-coil H is connected with the binding-posts J and K in the usual manner.

An electric circuit having been formed through the poor electric conductor N, as specified, it is obvious that any movement or vi-

bration of the vibratory plate B caused by acoustic or other influences will compress, through the bar O, the low electric conductor N between the disks P and P′, and that such compression will cause an increase of pressure of such low conductor against the inside of the cylinder F upon the occurrence of each vibration in consequence of its oblate shape due to the manner of its previous compression by the flanged screw-cap G, in combination with the disks P and P′ and the flanged end of the cylinder F, and will also cause an increase of the point of contact of the low conductor, N, on and an increased pressure of the same against the metallic pin S, thus giving six deviations of the electric current. To clearly understand these six deviations of the electric current the following explanation is offered here: The low conductor being of granulated substance confined between the elastic disks, the whole being inclosed in a metal cylinder provided with an inner flange at one end and a screw-cap at the other, is so arranged that the low conductor is compressed from without, consequently assuming an oblate form. Every forward stroke of the vibratory plate causes, first, an increased pressure of the low conductor against the sides of the cylinder; second, an increased pressure against the screw and pin; and, third, an increased surface contact of carbon on the pin, as the elastic disk P′ gives upon the pin for each vibration—that is, lets the pin deeper into the carbon, thus presenting a greater surface-bearing against the low conductor. The deeper the pin can be forced into the low conductor the better will be the conducting medium, the strength of which is proportionate to the deviation of the pressure in the cylinder. By this device an increased pressure of the low conductor against the sides of the cylinder will also generate a current of electricity upon the secondary wire of the induction-coil, as a back stroke of the vibratory plate occurs after the increased pressure of the forward stroke produced by acoustic influence. This back action duplicates the three deviations caused by the forward stroke, and as the deviations caused by the forward and backward strokes are equal it follows that there are altogether six deviations of the electric current. A forward stroke of the vibratory plate and bar O, which abuts against the elastic disk P, causes an increased pressure of the low conductor against the pin, and the tendency of the elastic disk P′ to strip or give upon the pin increases the surface of contact by forcing the pin deeper into the conductor, whereby a current is set up over the secondary wire of the induction-coil. By the back stroke, or return of the vibratory plate to its normal position, currents are produced in the coil of opposite polarity. Therefore, it being understood that any deviation (increased or diminished) of the electric current of the primary wire of an induction-coil will set up and generate a current in the secondary wire of the coil dependent upon and measured by the deviations of the current in the said primary wire, it must follow that by securing these deviations of the electric current, as before described and specified, acoustic influences operating upon the vibratory plate will be transmitted over a wire with great energy, and consequently to long distances and through great resistances.

In my former patent of March 18, 1879, No. 213,283, the point of contact is not adjustable. The necessary adjustment is effected by moving the cylinder containing the low conductor against the point of contact; but in this invention the adjustable cylinder containing the low conductor is held solid after a coarse adjustment has been made, while the refined adjustment is produced by forcing the point of contact deeply into the low conductor.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In speaking-telephones, a cylinder for containing the low conductor, combined with separate and independent devices for obtaining a coarse adjustment of the cylinder and a fine adjustment of the contact, substantially as described.

2. The adjustable cylinder F for containing the low conductor N, in combination with the acoustic or vibratory plate B and its arm O and the screw R and its pin S, said arm and pin being arranged opposite to each other and with the low conductor between them, in order to produce a deviation of the electric current, substantially as shown and described.

WEBSTER GILLETT.

Witnesses:
SAMUEL OPPENHEIM,
DANIEL G. THOMPSON.