

(No Model.)

2 Sheets—Sheet 1.

R. F. RANKIN.
TELEPHONE.

No. 567,688.

Patented Sept. 15, 1896.

Fig. 1

Fig. 2

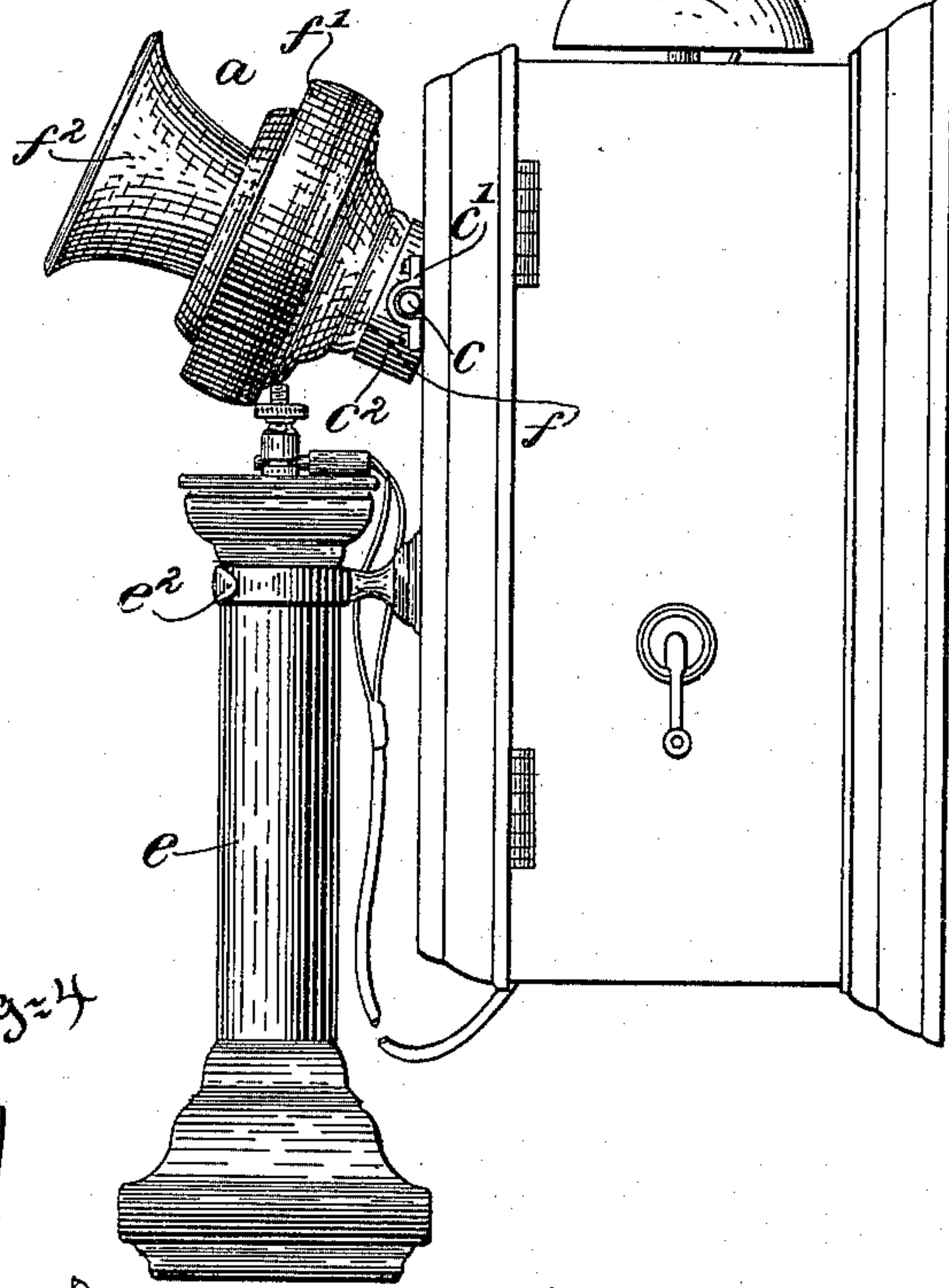
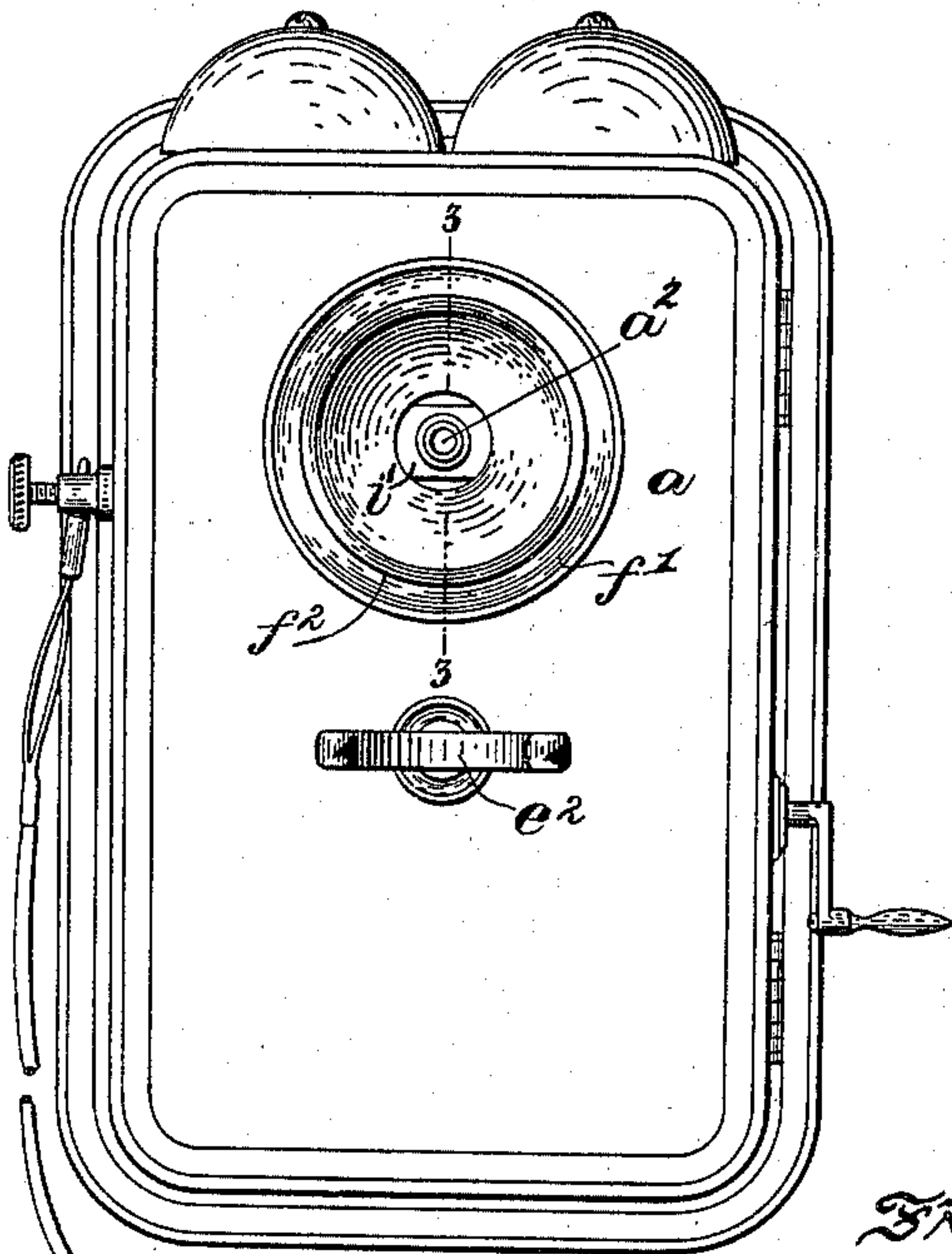


Fig. 4

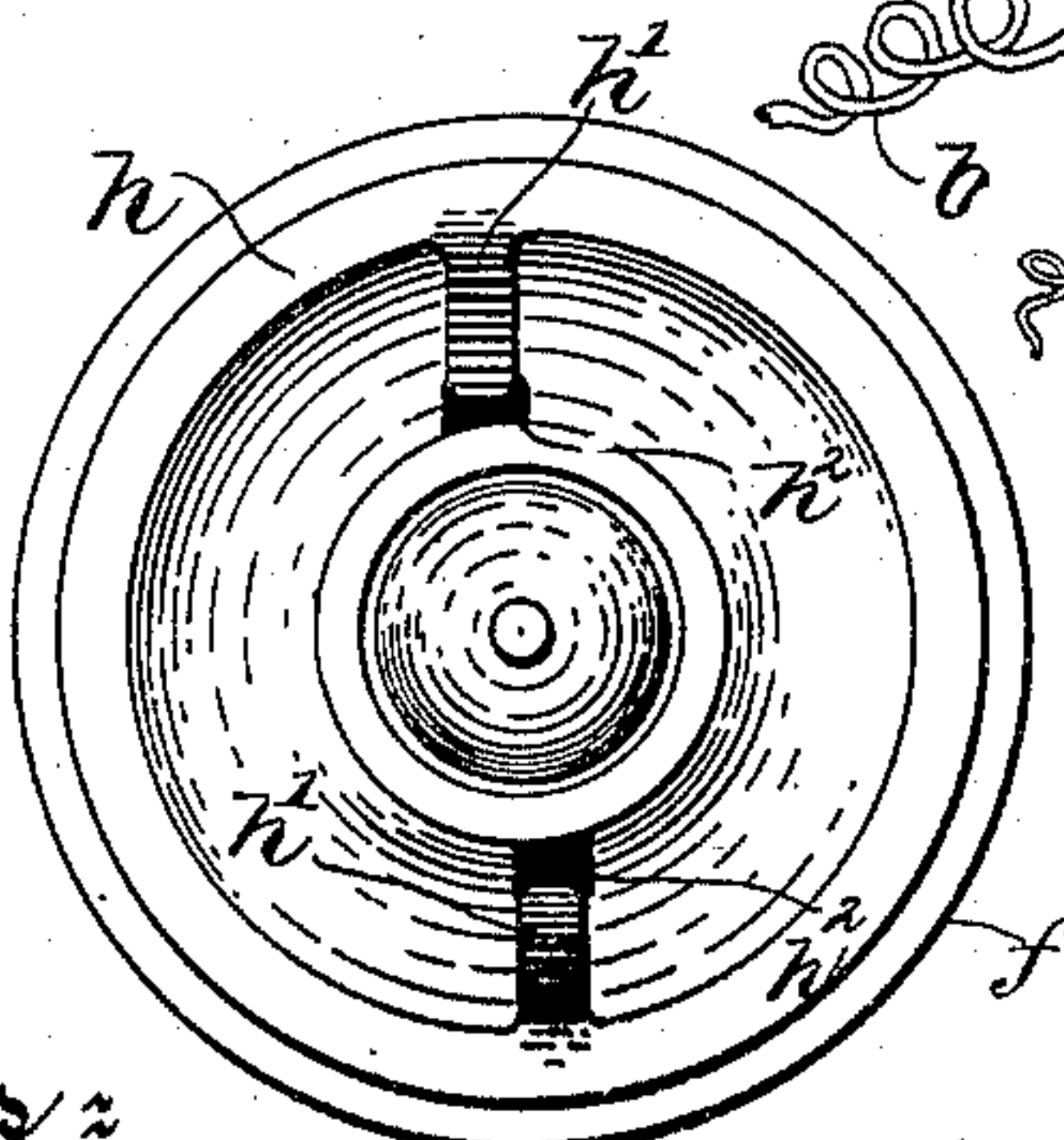
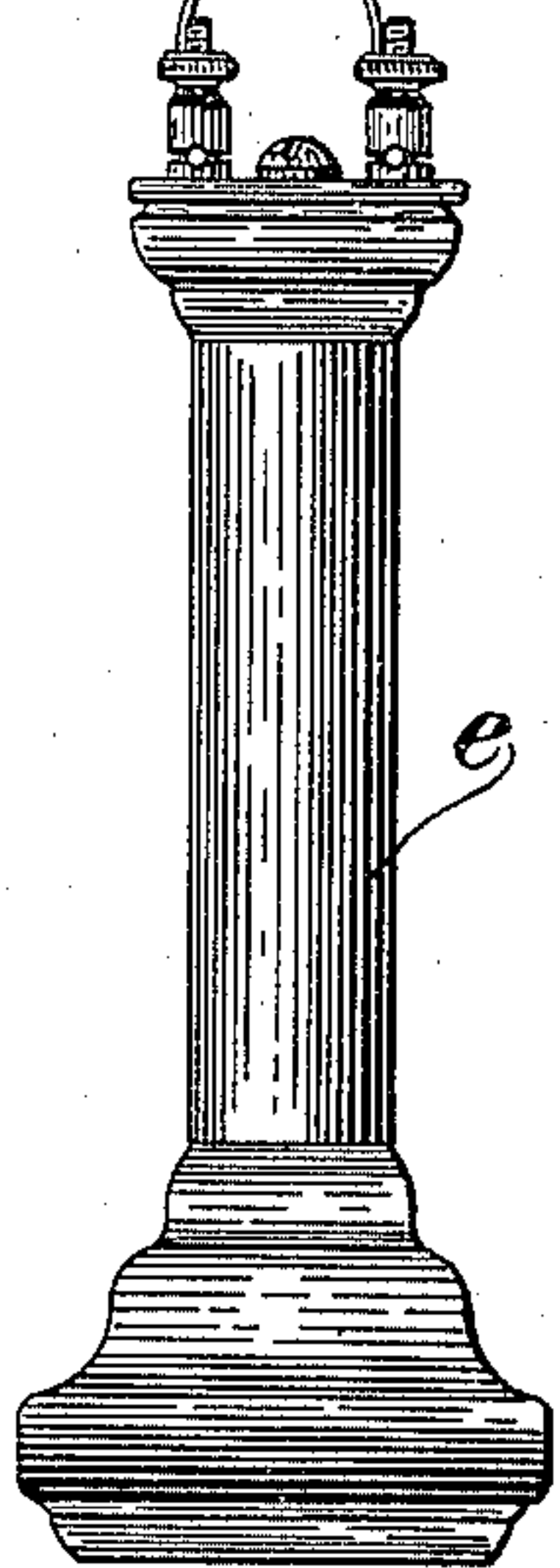
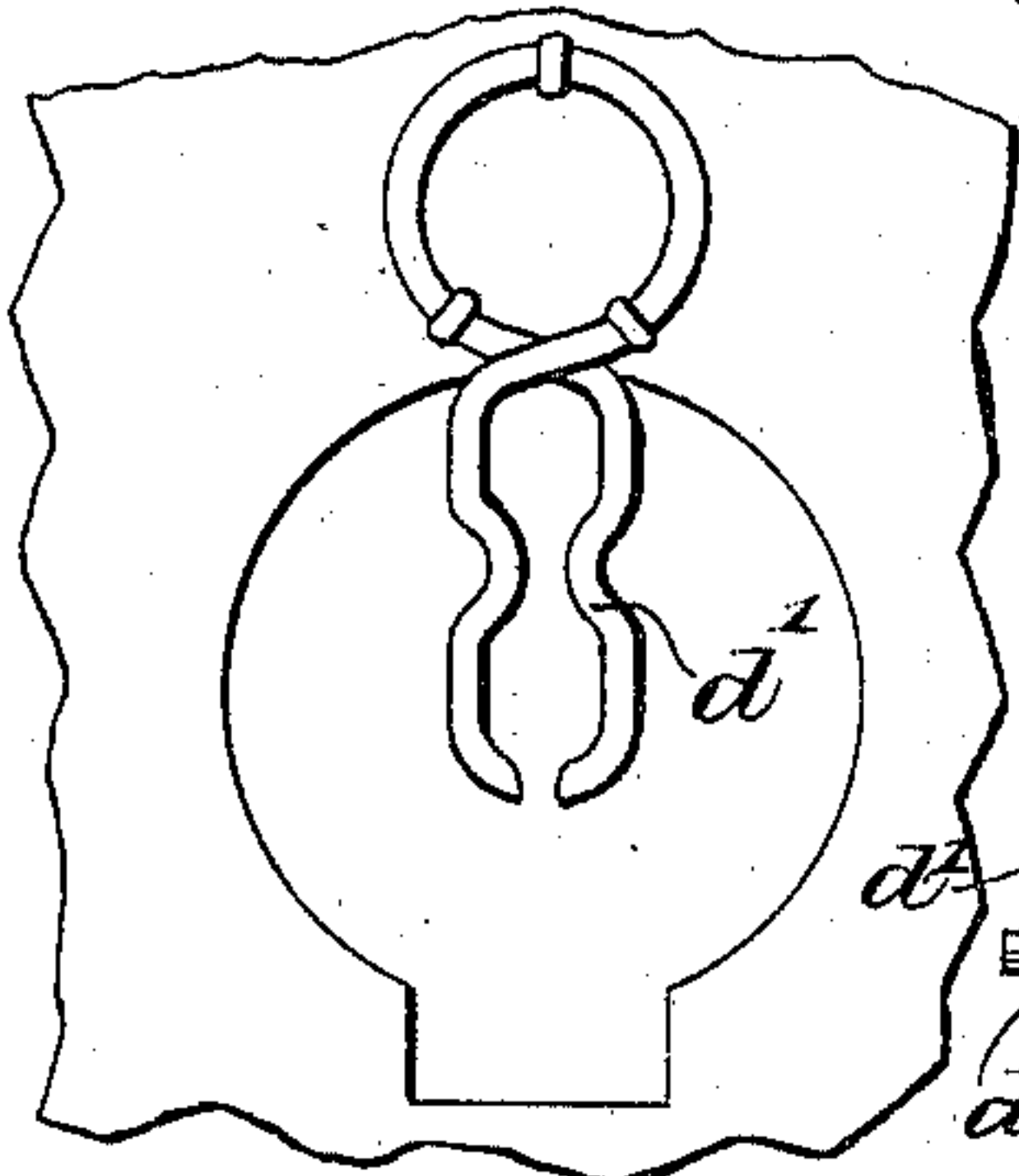


Fig. 5

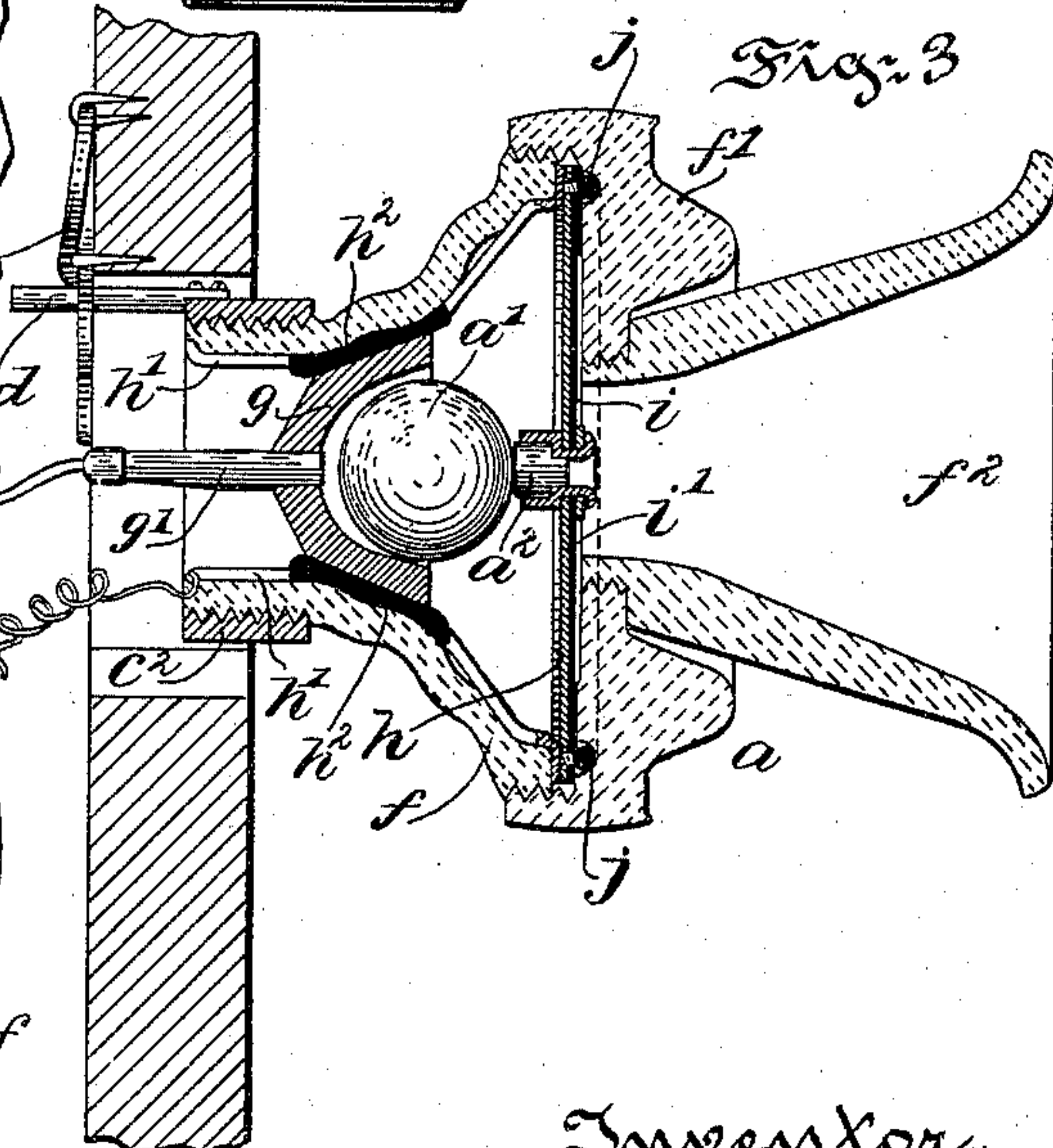


Fig. 3

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M. Gilligan.

Inventor.
Ransom F. Rankin.
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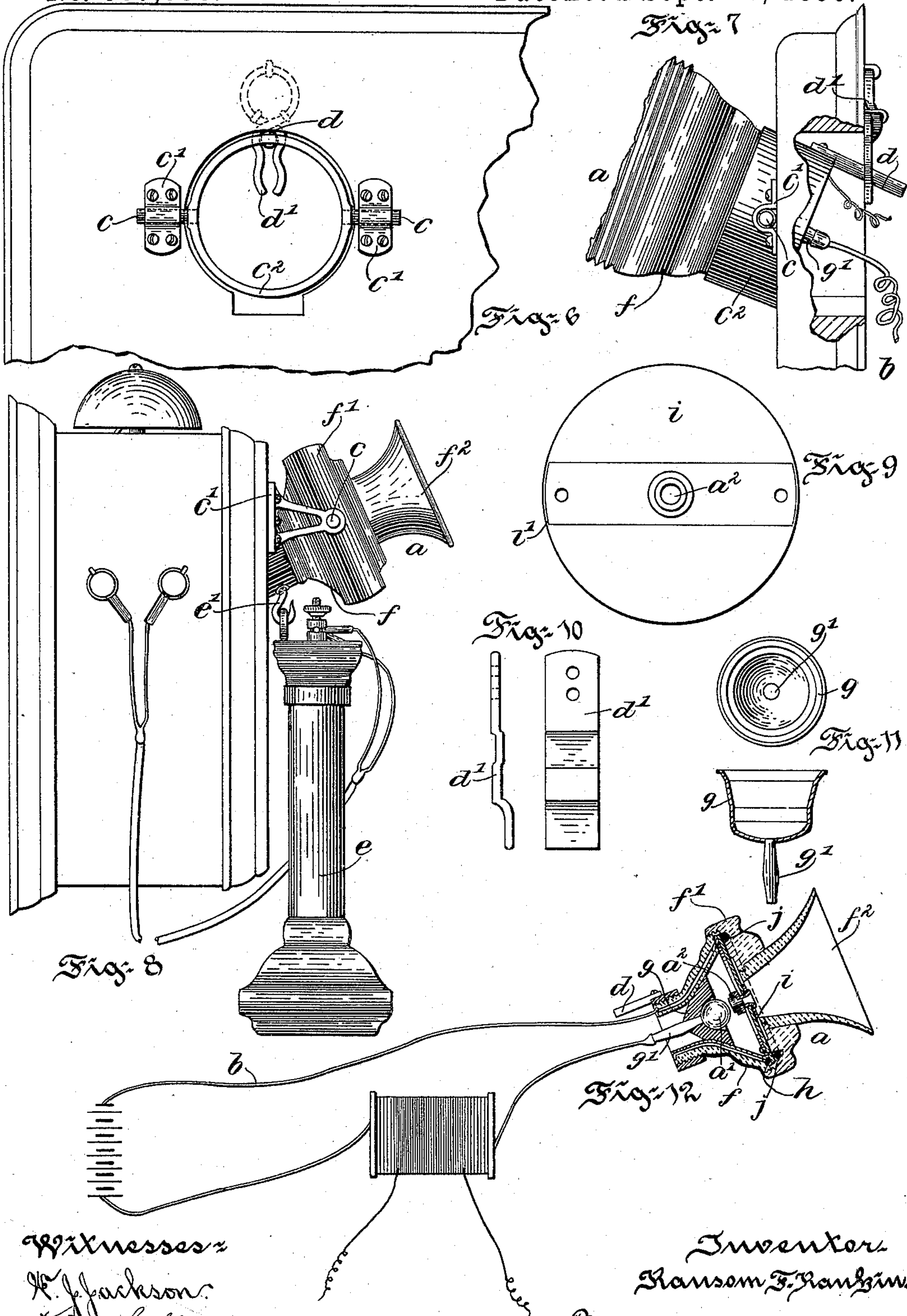
(No Model.)

2 Sheets—Sheet 2.

R. F. RANKIN.
TELEPHONE.

No. 567,688.

Patented Sept. 15, 1896.



Witnesses:
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T. M. Gilligan.

Inventor:
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UNITED STATES PATENT OFFICE.

RANSOM F. RANKIN, OF PHILADELPHIA, PENNSYLVANIA.

TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 567,688, dated September 15, 1896.

Application filed October 22, 1895. Serial No. 566,508. (No model.)

To all whom it may concern:

Be it known that I, RANSOM F. RANKIN, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Telephones, of which the following is a specification.

My invention relates to improvements in telephone instruments; and it is applicable, for example, to that type of instruments which operate in substantial accordance with the methods referred to by James W. Bonta, for instance, in his Patent No. 361,124, dated April 12, 1887.

The principal objects of my present invention are, first, to automatically insure a new or fresh contact for the rolling electrode prior to each use of the instrument, and, second, to provide a simple, efficient, and durable instrument.

The nature, characteristic features, and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a front elevational view of an instrument embodying features of my invention and showing the transmitter in position for use and the receiver detached from its support. Fig. 2 is a side view of the same, showing the receiver attached to its support and the transmitter in inoperative position. Fig. 3 is a sectional view, drawn to an enlarged scale, taken on the line 3 3 of Fig. 1 and showing the transmitter in position for use. Fig. 4 is a detail view showing one form of spring-clip for holding the transmitter in its respective positions, the spring-clip being drawn larger than in Fig. 3 for clearness of description. Fig. 5 is a front view of the transmitter with the rolling electrode and mouthpiece and its cap removed. Fig. 6 is a view illustrating the clip or spring and its complementary devices for controlling the position of the transmitter. Fig. 7 is a view partly in section illustrating the position of the parts when the transmitter is in inoperative position. Fig. 8 is a side view illustrating a modification of my invention in which the spring-clip is dispensed with. Fig. 9 is an enlarged view of the diaphragm illustrated

in Fig. 3. Fig. 10 illustrates a side and front view of a modified form of spring-clip. Fig. 11 illustrates in plan and central section the cup for the rolling electrode; and Fig. 12 is a diagrammatic view, partly in section, illustrating a modified arrangement of the parts of the transmitter.

In apparatus embodying features of my invention, the transmitter *a* is pivotally supported, so that when it is turned upward out of the horizontal position its rolling electrode *a'* gravitates out of contact with its diaphragm-electrode *a²*, as shown in Figs. 2, 7, 8, and 12, and so that when it is turned into horizontal position, Figs. 1 and 3, its rolling electrode *a'* gravitates into contact with its diaphragm-electrode *a²*, thus presenting a new or fresh point of contact to the same and also closing the local battery-circuit *b*, whereupon the instrument is in condition for use.

Obviously the foregoing movements of the transmitter *a* may be accomplished through the intervention of different types of mechanism.

In Figs. 2, 3, 4, and 6 the transmitter *a* is provided with trunnions *c*, adapted to bearings *c'*, and in this instance the trunnions *c* are mounted upon a ring *c²*, into which the transmitter is fitted. Clearly these trunnions and their bearings *c'* afford means for permitting the transmitter to be turned into and upward from its horizontal position.

As shown in Fig. 8, the ring is dispensed with and the trunnions *c* are applied to the transmitter.

The transmitter may be caused to remain in either horizontal or inclined position by means of a heel *d* and its complementary spring-clip *d'*. The heel *d* is applied or attached to the transmitter, for example, through the intervention of the ring *c²*, and the spring-clip is attached to the casing or housing of the instrument.

As shown in Figs. 4 and 6, the spring-clip is split and adapted to grasp the heel *d* in two positions, corresponding, respectively, with the horizontal and inclined positions of the transmitter. In Fig. 10 the spring is not split, and operates upon the end of the heel. In Fig. 8 the spring-clip and heel are dispensed with and the transmitter is held in inclined position by the weight of the receiver *e*, which,

for this purpose, is hung upon a hook e' , applied to the transmitter in rear of its trunnions, yet, if desired, the apparatus could be so constructed as that the friction between the trunnions c and bearings c' would operate to retain the transmitter in inclined position.

As illustrated in the drawings, the receiver e may not be hung up until the transmitter has been turned into inoperative position. As shown in Fig. 2, this result is accomplished by placing the support e^2 for the receiver so near the transmitter as not to permit of the hanging up of the receiver until the transmitter is turned into inclined position. As shown in Fig. 8, the weight of the receiver operates to hold the transmitter in inclined or inoperative position.

The transmitter shown in the drawings in itself contains features of my invention in addition to those above referred to.

In Figs. 3 and 12, f is an insulating tubular housing provided with a cap f' , which may in turn be provided with a mouthpiece f^2 . g is a conducting flaring cup fitted in the insulating housing or shell and provided with a rearwardly-extending terminal g' , to which one of the conductors of the primary circuit is attached. It may be remarked that this terminal g' may be employed in connection with the spring-clip for controlling the position of the transmitter.

h is a conducting-ring provided with one or more, in the present instance two, arms h' , that extend rearwardly through the housing or tubular shell f , and to which the other conductor of the local battery-circuit is attached. These arms h' may be insulated from the cup g by covering them with suitable insulating material h^2 , as shown in Fig. 3, or by passing them through suitable channels cut or otherwise formed in the housing or tubular shell f , as shown in Fig. 12.

The diaphragm i may consist of non-conducting material, in which case its electrode a^2 is in circuit with a conducting-strip i' , Fig. 9, that contacts with the ring h , or the diaphragm may consist of metal, as shown in Fig. 12, in which case the strip i' is dispensed with, because the metal of the diaphragm carries the current to the ring h . In either case the diaphragm and ring are clamped together between the housing or tubular shell f and its cap f' .

j is a ring or gasket, of soft material, as felt or rubber, placed around the face of the diaphragm opposite the ring h , for the purpose of insuring good contact between the ring and diaphragm and for taking up undue vibration.

The mode of operation of apparatus embodying features of my invention may be described as follows: When the instrument is to be used, the transmitter is turned into horizontal position, with the result that the rolling electrode gravitates into contact with the diaphragm-electrode and of course presents fresh points of contact between the electrodes

each time this operation is repeated. This is important, because it insures good contact between the rolling and diaphragm electrodes every time the instrument is used. When the transmitter is employed to transmit speech, the local circuit is through the battery-wires, induction-coil, terminal g' , cup g , rolling electrode a , diaphragm-electrode a^2 , diaphragm, ring h , and arms or legs h' , and is made and broken in accordance with the method of Bonta, above referred to. The described movements of the transmitter perform, in addition to the results set forth, the following important function, namely, to automatically control the local circuit in such manner that it is automatically interrupted by the described separation of the electrodes when the transmitter is turned into inclined position and is automatically closed by the described contact of the electrodes when the transmitter is turned into horizontal position.

It will be obvious to those skilled in the art to which my invention appertains that modifications may be made in details without departing from the spirit thereof. Hence I do not limit myself to the precise construction and arrangement of parts hereinabove set forth and illustrated in the accompanying drawings; but,

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of circuit connections leading to a diaphragm-electrode and to a support, a rolling electrode carried by said support and adapted to close said circuit, and a hinged or pivoted transmitter carrying said support and adapted to be turned to change the inclination thereof and cause the rolling electrode to gravitate in respect to the diaphragm for controlling said circuit, substantially as described.

2. The combination of circuit connections leading to a diaphragm-electrode and to a support, a rolling electrode carried by said support and adapted to close said circuit, a hinged or pivoted transmitter carrying said support and adapted to be turned to change the inclination thereof and cause the rolling electrode to gravitate in respect to the diaphragm for controlling said circuit, and means for detaining said transmitter in its respective positions, substantially as described.

3. The combination in a telephone-transmitter of, a housing or tubular shell, a flaring cup provided with a terminal and fitted in said tubular shell, a ring provided with arms penetrating said shell and insulated from said cup, a diaphragm and its electrode in circuit with said ring, a cap engaging said shell and clamping said ring and diaphragm, a rolling electrode accommodated by said cup, and circuit connections, substantially as described.

4. In combination an insulating-shell provided with channels, a flaring cup provided with a terminal and fitted in said tubular

shell, a ring applied to the end rim of said shell and provided with arms penetrating said channels, a diaphragm provided with an electrode and superposed on said ring, an
5 annular gasket superposed on the face of said diaphragm, a cap engaging the shell and clamping the ring, diaphragm and gasket, and a rolling electrode accommodated by said cup, substantially as described.

10 5. In combination an insulating-shell provided with channels, a flaring cup provided with a terminal and fitted in said tubular shell, a ring provided with arms penetrating said channels, a diaphragm provided with an
15 electrode and superposed on said ring, a cap engaging the shell and clamping the ring and diaphragm, and a rolling electrode accommodated by said cup, substantially as described.

20 6. The combination in a telephone-transmitter, of, a tubular housing or shell, a flaring cup provided with a terminal and fitted in said tubular shell, a ring applied to the end face of said shell or housing and provided with arms penetrating said shell and insu-

lated from said cup, a diaphragm superposed 25 on said ring, an annular gasket superposed on the face of said diaphragm, and a cap engaging said shell and clamping said ring, diaphragm and gasket, substantially as described. 30

7. The combination of circuit connections leading to an electrode and to a support, a movable electrode carried by said support and adapted to close said circuit, and a hinged or pivoted transmitter carrying said support 35 and electrodes and adapted to be turned to change the inclination thereof and cause the movable electrode to gravitate in respect to the first-mentioned electrode for controlling said circuit, substantially as described. 40

In testimony whereof I have hereunto signed my name in the presence of two witnesses.

RANSOM F. RANKIN.

Witnesses:

A. B. STOUGHTON,
K. M. GILLIGAN.