

(No Model.)

L. D. APPLEMAN.
TELEPHONE TRANSMITTER.

No. 559,476.

Patented May 5, 1896.

Fig. 2.

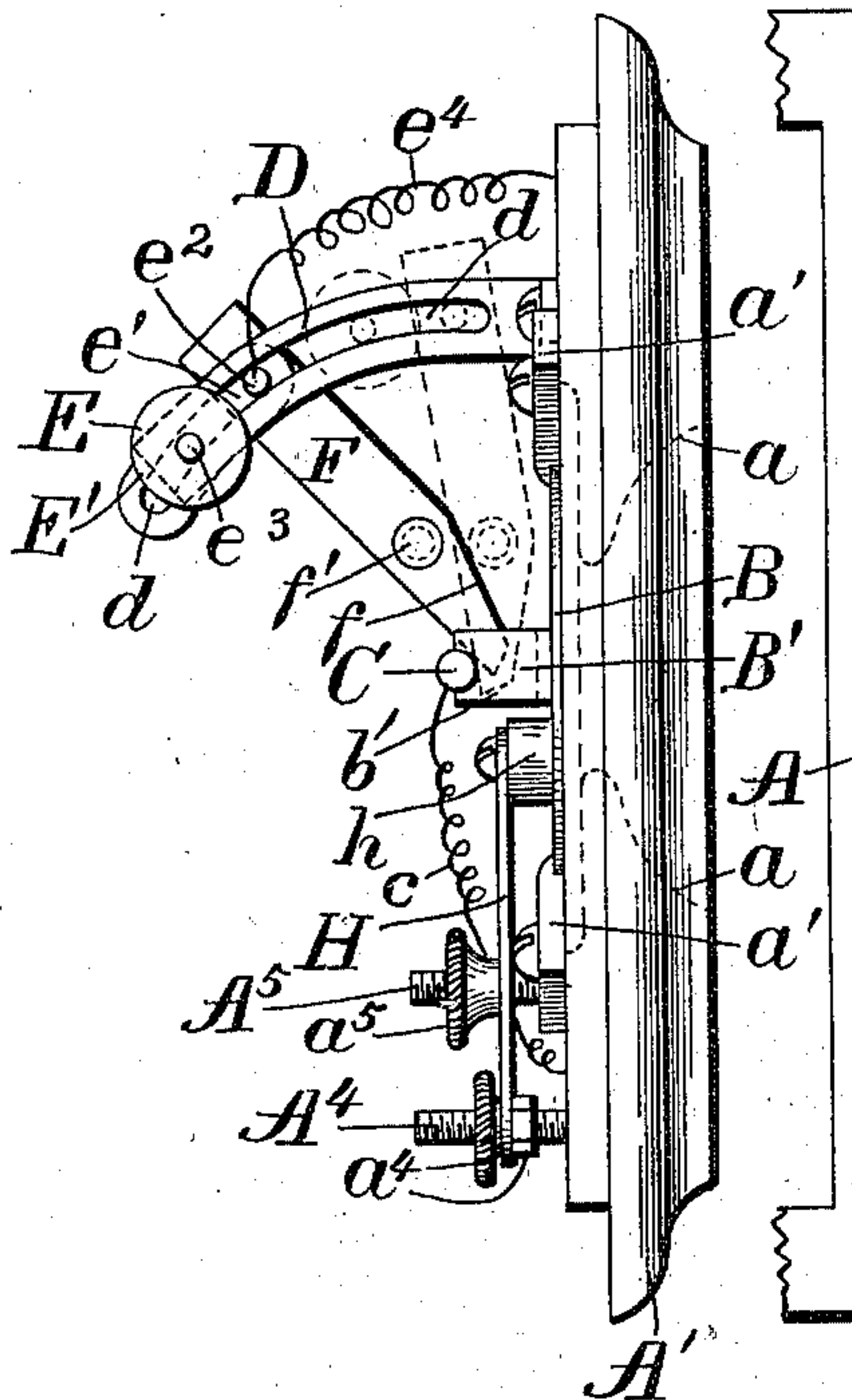


Fig. 1.

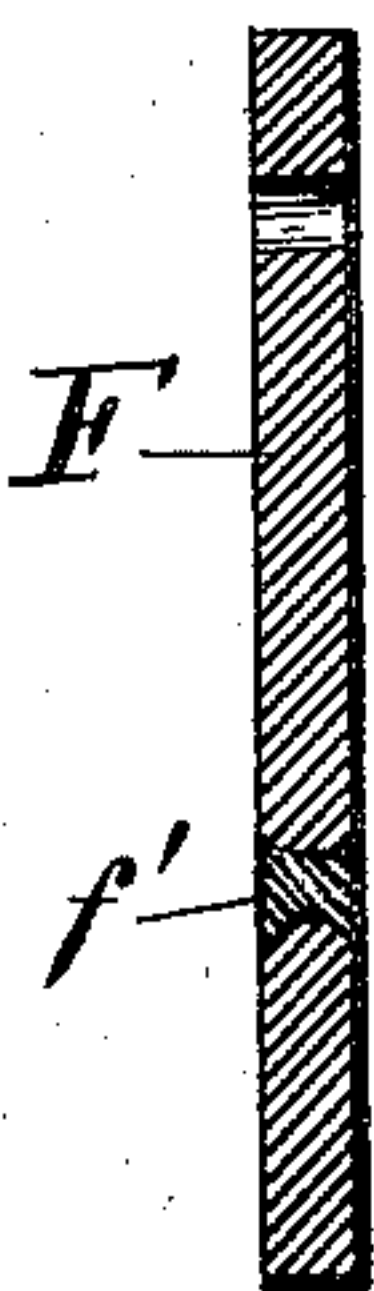
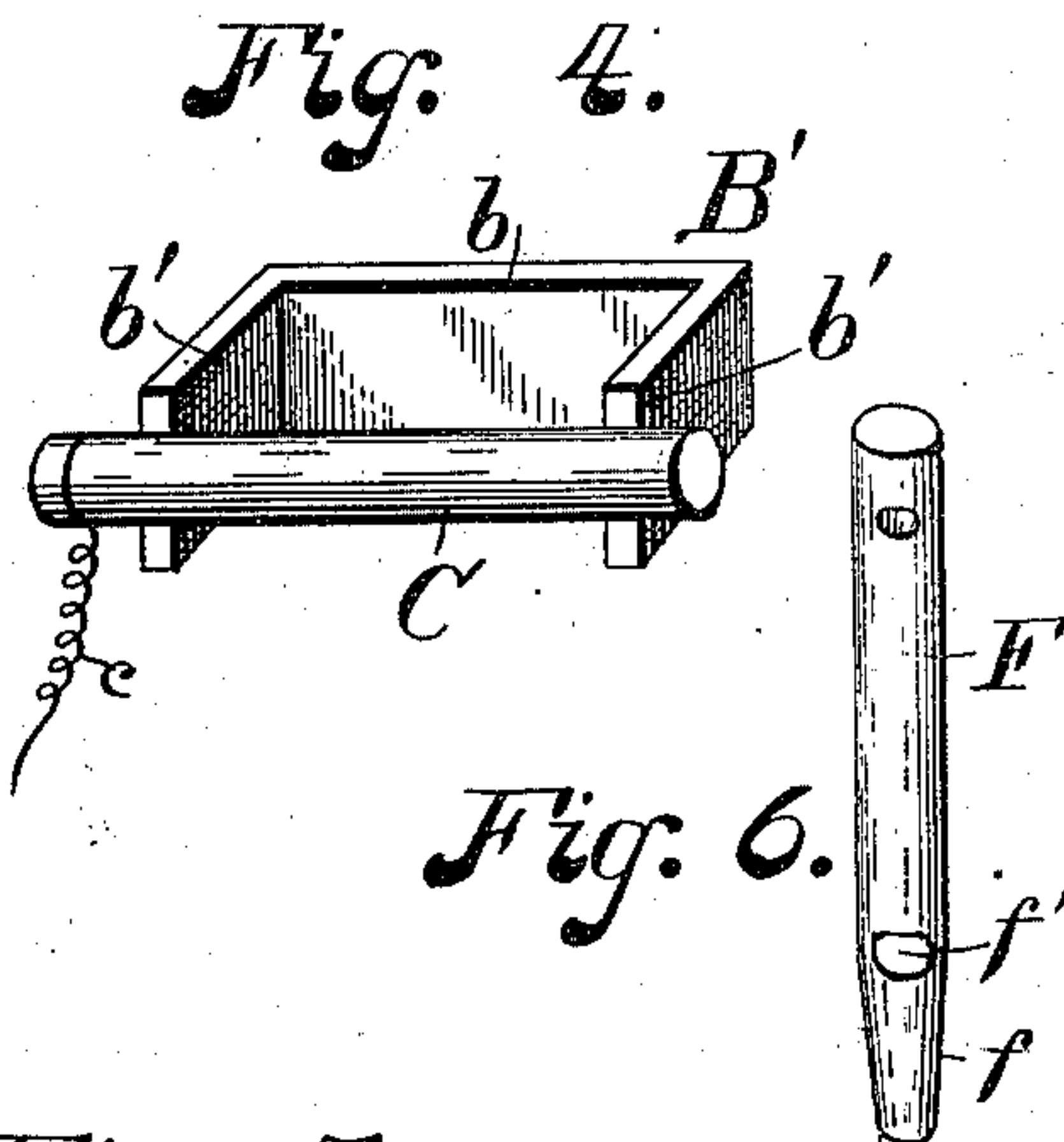
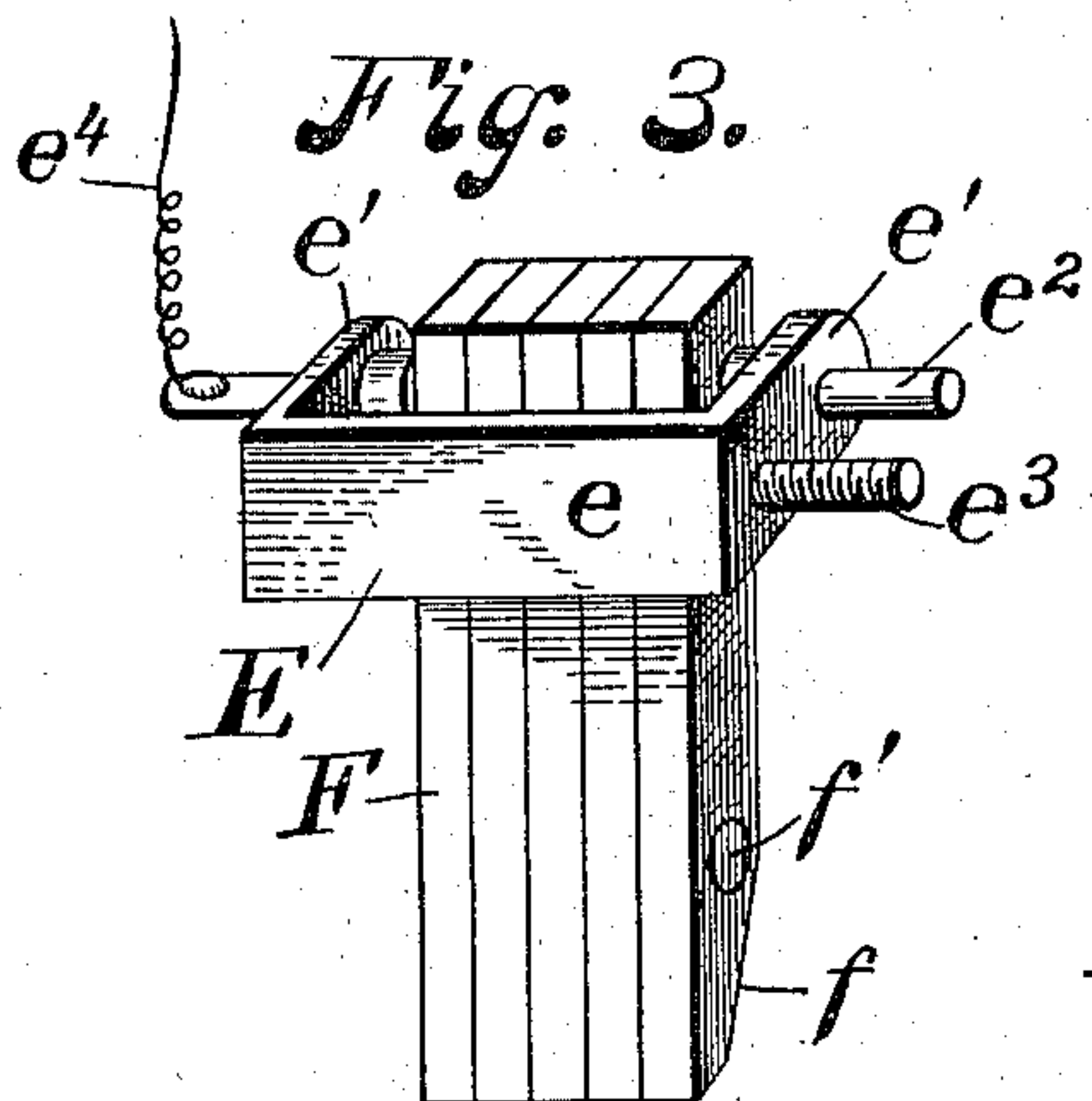
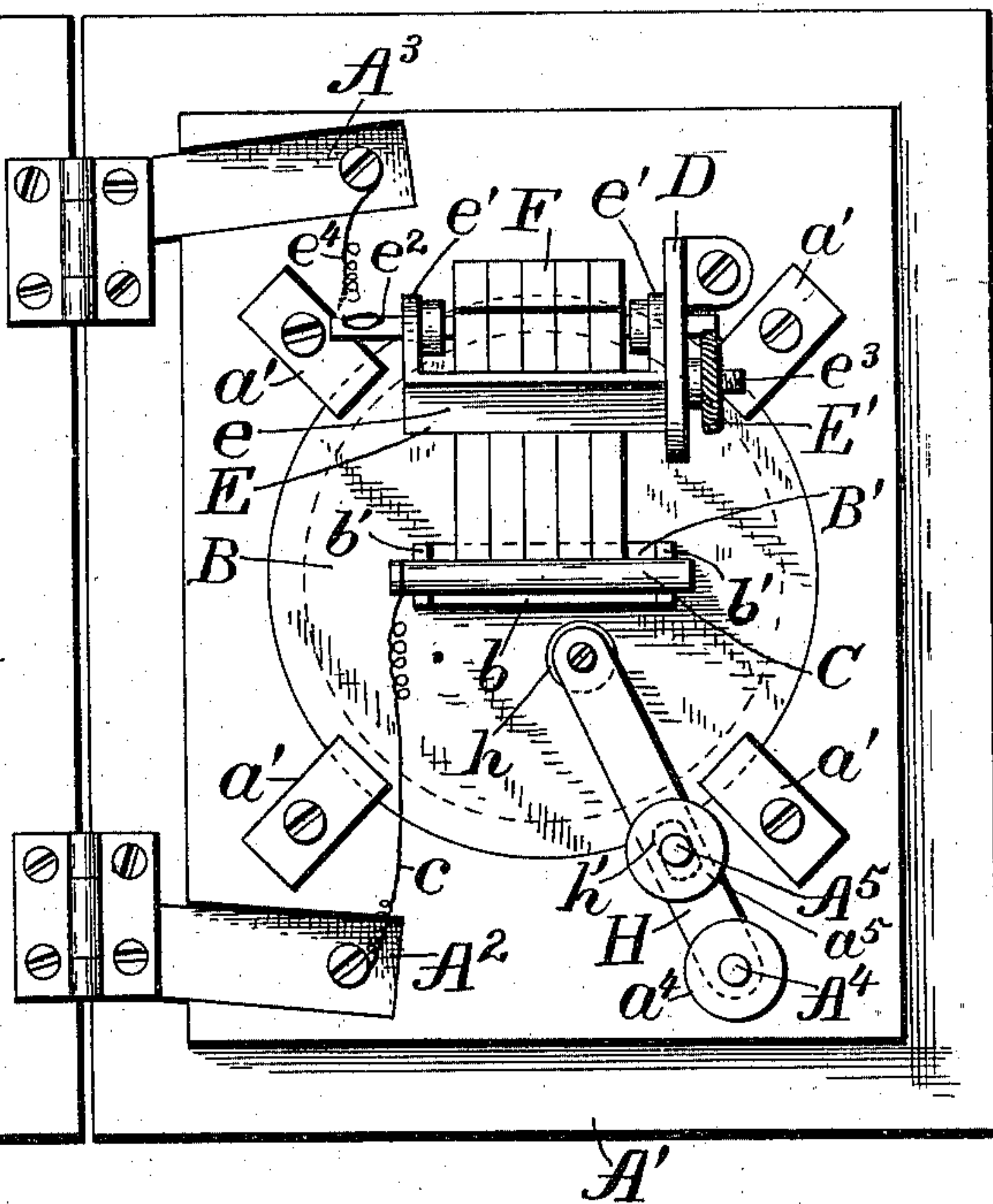


Fig. 5.



Fig. 6.

Witnesses
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UNITED STATES PATENT OFFICE.

LOUIS D. APPLEMAN, OF WAYNESBOROUGH, VIRGINIA.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 559,476, dated May 5, 1896.

Application filed May 25, 1895. Serial No. 550,639. (No model.)

To all whom it may concern:

Be it known that I, LOUIS D. APPLEMAN, a citizen of the United States, residing at Waynesborough, in the county of Augusta and State of Virginia, have invented certain new and useful Improvements in Telephone-Transmitters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in electric telephone-transmitters; and it consists of the improved construction to be hereinafter fully described and claimed.

Reference is had to the accompanying drawings, in which similar letters of reference designate corresponding parts in the several views.

Figure 1 represents an elevation of the inside of the front piece of the transmitter, the same being shown as swung upon its hinges with the several operating parts in position. Fig. 2 represents an edge view of the said front piece and the mechanism carried thereby. Fig. 3 represents a detail perspective view of the carriage and pencils carried thereby. Fig. 4 represents a detail perspective view of the bridge and electrode for the back of the diaphragm. Fig. 5 represents a detail sectional view of one of the pencils, and Fig. 6 represents a modified form of pencil.

A designates a portion of the transmitter-box, to which the front piece A' is hinged. The front piece A' is centrally perforated in the usual manner, as shown by the dotted lines *a* in Fig. 2, and the diaphragm B is secured to the back thereof, over the opening, by means of the clamp-pieces *a'* or in any other suitable manner, so that the central part of the diaphragm will be free to vibrate. Upon the back of the diaphragm at its center is secured the bridge B', which consists of a U-shaped frame of wood or other insulating material, having a flat side *b*, which is secured to the diaphragm, and the ends *b'*, projecting backward therefrom.

A metallic bar C, forming one of the electrodes of the transmitter, is secured to the two rear ends of the end pieces *b'* of the bridge. This bridge B' and electrode C being

rigidly secured to the center of the diaphragm will vibrate therewith. A wire *c* makes electrical connection from the electrode C to a contact-strip A², which leads out of the transmitter and is connected with the line-wire in any suitable manner. A little above the diaphragm and to one side thereof is secured to the front piece A' a segmental piece D, which extends backward and is curved downward in an arc of a circle, as shown in Fig. 2, and the said segmental piece is slotted nearly its whole length, as at *d*, the purpose of which will appear hereinafter.

E designates a carriage consisting of a U-shaped frame having a straight flat piece *e* and the two end pieces *e'*, through the ends of which latter passes a metallic conducting-rod *e*². One end of the carriage E is provided with a screw-threaded stem *e*³, which, when the carriage is in position in the transmitter, passes through the slot *d* in the segmental piece D and is held firmly therein by a thumb-nut E', screwed on the stem *e*³ to clamp against the segmental piece D. One end of the conducting-rod *e*² also passes through the slot *d* in the segmental piece D to steady the carriage in position before the clamp-nut is tightened.

By reference to Figs. 1 and 2 of the drawings it will be seen that the carriage E is supported above the center and back of the diaphragm B, and is capable of adjustment along the slot in the segmental piece D.

A number of pencils F of carbon or other conducting material are hung loosely upon the conducting-rod *e*², so that their lower ends, which may be reduced in size, as shown at *f*, will be supported upon the electrode C and between it and the diaphragm B and the electrode C, and these pencils F will bear heavier or lighter upon the said electrode as the carriage is set farther back or higher up in the slot *d* in the segmental piece D. The lower ends of the pencils F are weighted, as at *f'*, to cause them to rest more firmly upon the electrode C and to more closely follow the vibrations thereof. The said weights *f'* are placed in holes, which are countersunk in each side of the said pencils and spread in the form of a rivet, as shown in Fig. 5 of the drawings. The pencils F may have flat sides,

as shown in the first figures of the drawings, or they may be round, as shown in Fig. 6, the exact form thereof being immaterial.

The conducting-rod e^3 of the carriage E is electrically connected by a wire e^4 with a contact-strip A^3 , which leads out of the transmitter and is connected with the line-wire in any suitable manner. Thus the circuit through the transmitter will be from the line to one contact-strip—say A^2 —by the wire c to the electrode C, to the pencils F, to the conducting-rod e^2 , by wire e^4 to the contact-strip A^3 , and thence over the line.

The operation of the transmitter is as follows: When the sound-waves strike the diaphragm, causing it to vibrate in unison therewith, the first movement of the electrode C will be away from the pencils F and tend to break the contact therewith, thus causing a momentary decrease in the electrical current over the line. In short, the diaphragm in a telephone is always driven by the sound-waves away from the speaker. Consequently in the old form the fixed electrode is driven against the variable-contact electrodes, evidently tending to carry the variable-contact electrodes forward with it out of the true position, in which the variable-contact electrodes should be maintained, causing confusion, or part of the sound-waves may be lost. This objection is obviated in the construction of my transmitter by placing the free ends of the swinging electrodes between the fixed electrode and diaphragm. Thus the fixed electrode being driven away from the variable-contact electrodes the variable-contact electrodes always maintain their true position, and, being loaded in this position, practically remain still, resisting any tendency to vibrate with the diaphragm, thereby giving the widest possible scope of variation of contact-pressure and being perfectly true to the sound-waves or vibrations of the diaphragm, and press harder thereon the instant the electrode stops or starts back again, thus increasing the quantity of current passing over the line. Thus the slightest movement or vibration of the diaphragm will cause a change or pulsation in the current and cause a corresponding vibration of the diaphragm in the receiver at the other end of the line. By moving the carriage along in the slot d in the segmental piece D the pencils may be adjusted to rest lightly or heavier upon the electrode C, thus making a very sensitive instrument.

To prevent excessive vibration of the diaphragm a "damping-spring" H is employed, one end of which is perforated to pass over a screw A^4 , projecting from the back of the front piece A' , upon which it is adjustably held between the nuts a^4 , and the other end of the said spring is provided with an elastic button h of cork or other elastic material not affected by heat or dampness, which is adjusted to rest lightly upon the diaphragm to check or "damp" the vibrations thereof. The damping-spring H is slotted or perforated, as

at h' , to pass over a second screw A^5 , also projecting from the back of the front piece A' . A tension-nut a^5 is screwed on the screw A^5 to bear upon the damping-spring H and adjust the pressure of the elastic button h upon the diaphragm. By this construction it will be seen that the elastic button h may be adjusted independently of any other parts of the instrument, and may be adjusted so as to check the useless vibrations, or, in other words, to stop the vibrations after they have done their work.

The elastic button h is preferably made of cork, as that substance will retain its "life" and elasticity longer than rubber.

I claim—

1. In a telephone-transmitter the combination with a diaphragm, a bridge secured to the back of said diaphragm and an electrode carried by the said bridge: of a carriage supported above the said bridge, conducting-pencils loosely hung in the said carriage, and hanging between the diaphragm and the electrode, resting upon the latter, substantially as described.

2. In a telephone-transmitter the combination with a diaphragm, a bridge secured to the back of said diaphragm, and an electrode carried by the said bridge; of a carriage adjustably supported above the said bridge, a metallic conducting-rod passing through the said carriage, conducting-pencils loosely hung upon the said conducting-rod, hanging between the diaphragm and the electrode and resting upon the latter; substantially as described.

3. In a telephone-transmitter the combination with a diaphragm, a bridge secured to the back of said diaphragm, and an electrode carried by the said bridge; of a slotted segmental piece secured above the diaphragm, a carriage carried by the said segmental piece and adjustable thereon, conducting-pencils loosely hung in the said carriage, hanging between the diaphragm and the said electrode, and resting upon the latter, substantially as described.

4. In a telephone-transmitter the combination with a diaphragm, a bridge secured to the back of said diaphragm, and an electrode carried by the said bridge; of a carriage adjustably supported above the said bridge, a metallic conducting-rod passing through the said carriage, conducting-pencils loosely hung upon the said conducting-rod, hanging between the diaphragm and the electrode and resting upon the latter, and weights in the lower ends of the said pencils, substantially as described.

5. In a telephone-transmitter the combination with a diaphragm, a bridge secured to the back of said diaphragm, and an electrode carried by the said bridge; a carriage supported above the said bridge, conducting-pencils loosely mounted in the said carriage to hang between the diaphragm and the electrode, and rest upon the latter, of a damping-

spring, secured to the case of the instrument,
a button upon the end of the said damping-
spring to rest upon the diaphragm, and
means for adjusting the pressure of the said
5 button upon the diaphragm, substantially as
described.

6. In a telephone-transmitter the combina-
tion with a diaphragm and a fixed electrode
connected thereto and moving therewith of a
10 suspended conducting-pencil having its end
projecting between the diaphragm and the
fixed electrode and bearing against the lat-
ter, substantially as described.

7. In a telephone-transmitter, the combina-

tion with a diaphragm and a fixed electrode 15
connected thereto and moving therewith, of
a plurality of suspended conducting-pencils
having their free ends projecting between
the diaphragm and the fixed electrode and
bearing against the latter, substantially as 20
described.

In testimony whereof I affix my signature
in presence of two witnesses.

LOUIS D. APPLEMAN.

Witnesses:

WM. A. RIFE,

JAS. A. FISHBURNE.