

(No Model.)

J. W. COLBY.
MECHANICAL TELEPHONE.

No. 371,551.

Patented Oct. 18, 1887.

Fig. 1.

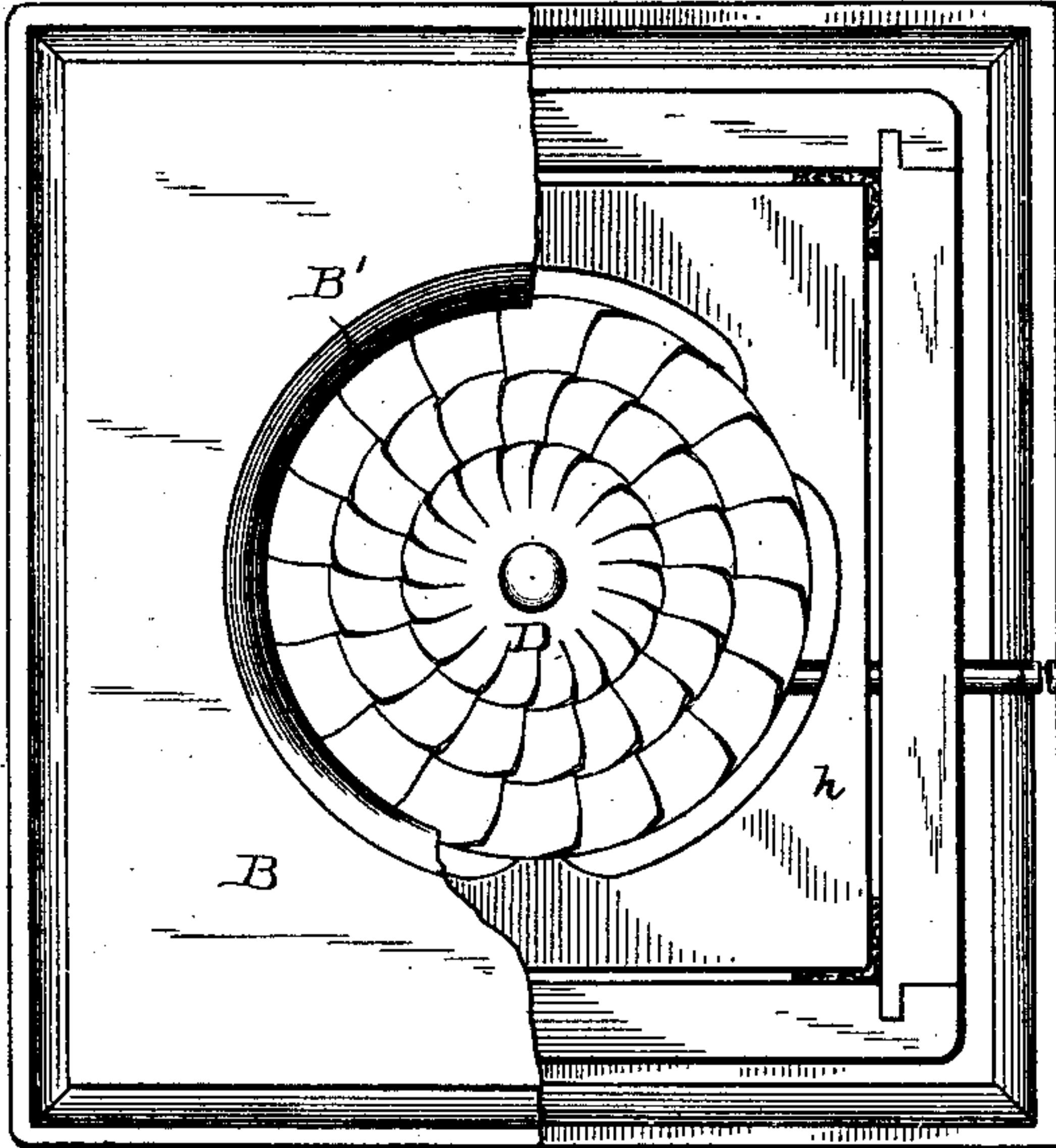


Fig. 2.

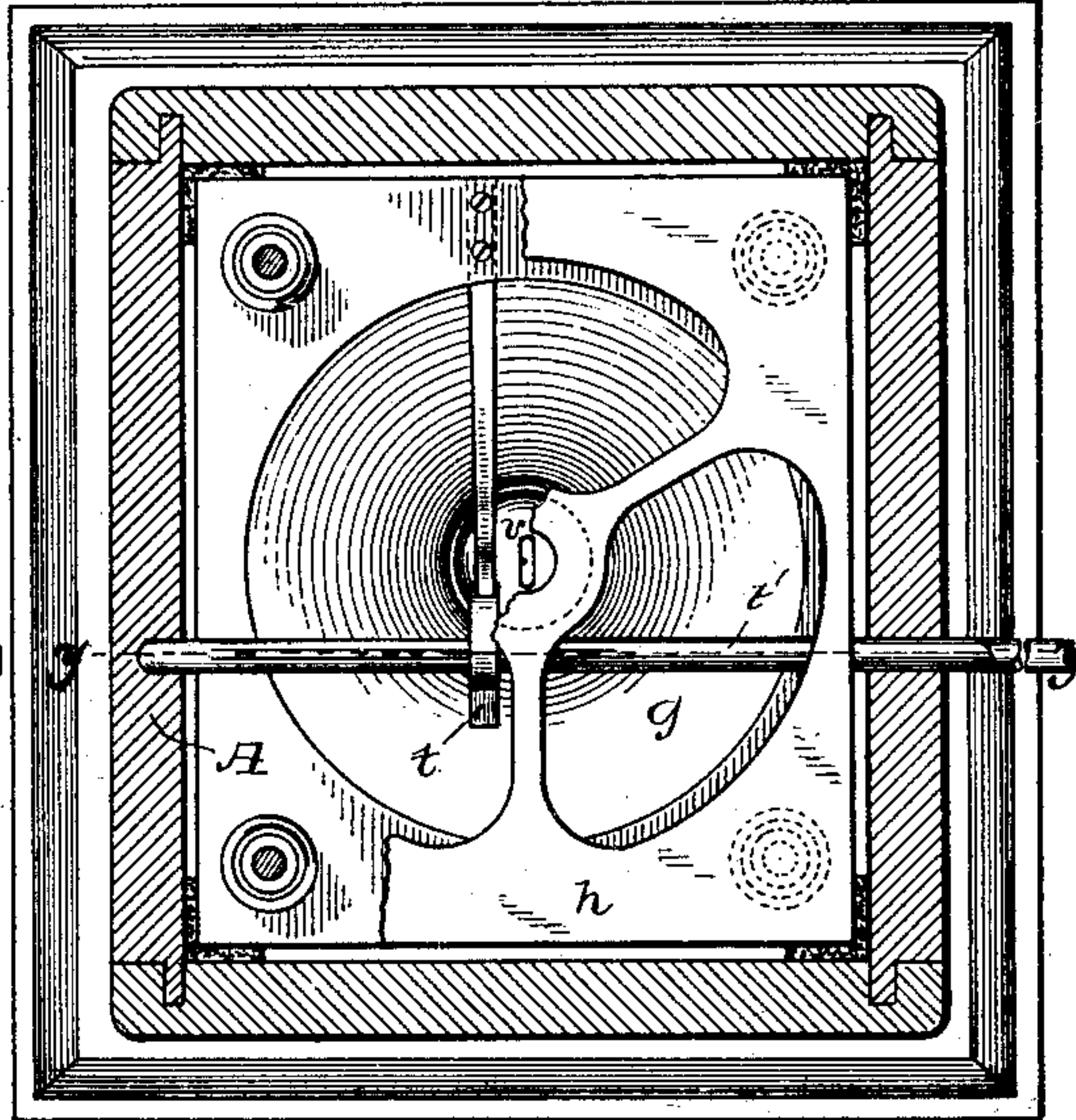


Fig. 3.

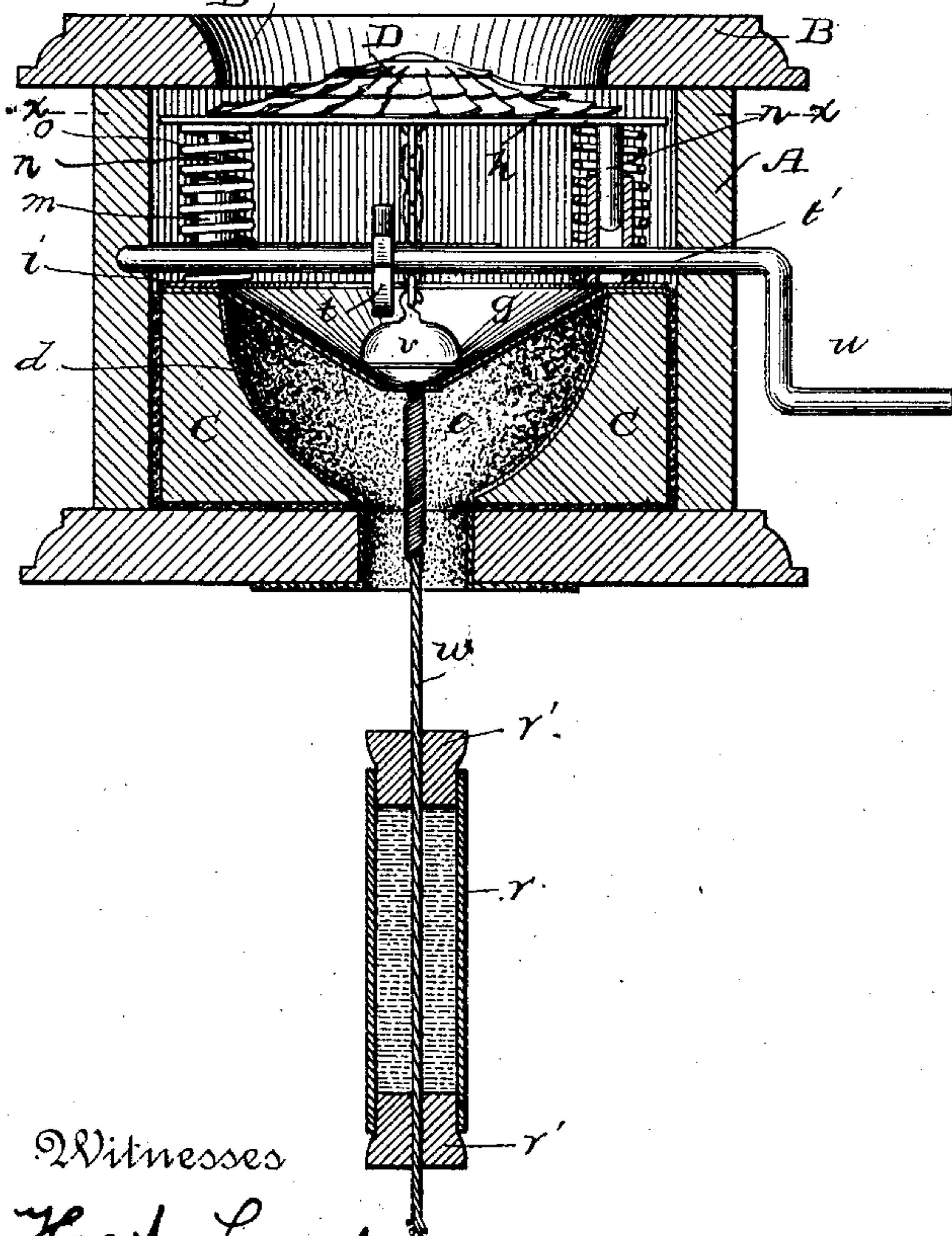


Fig. 4.

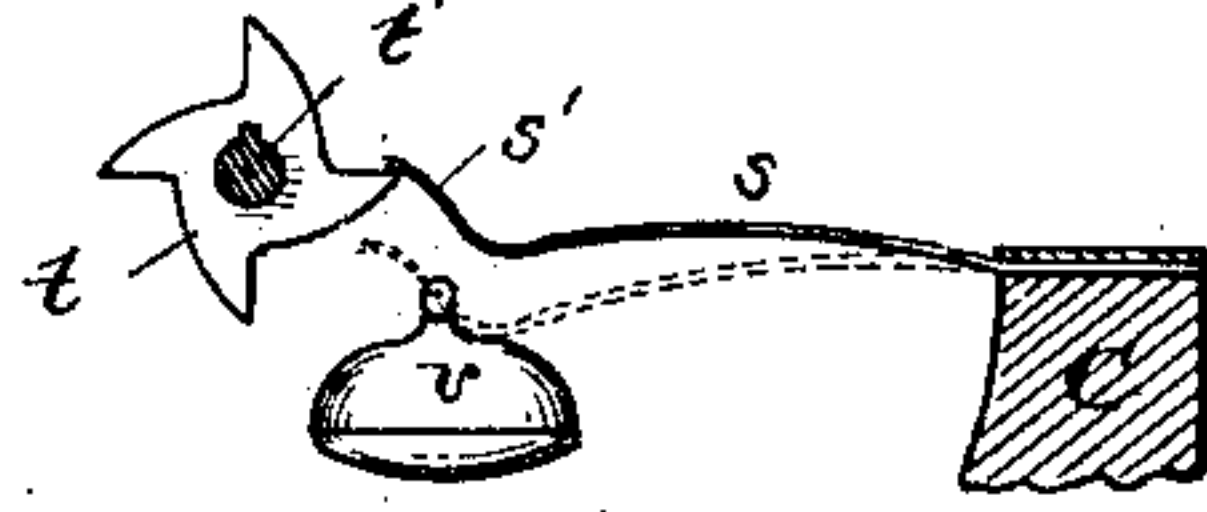


Fig. 5.

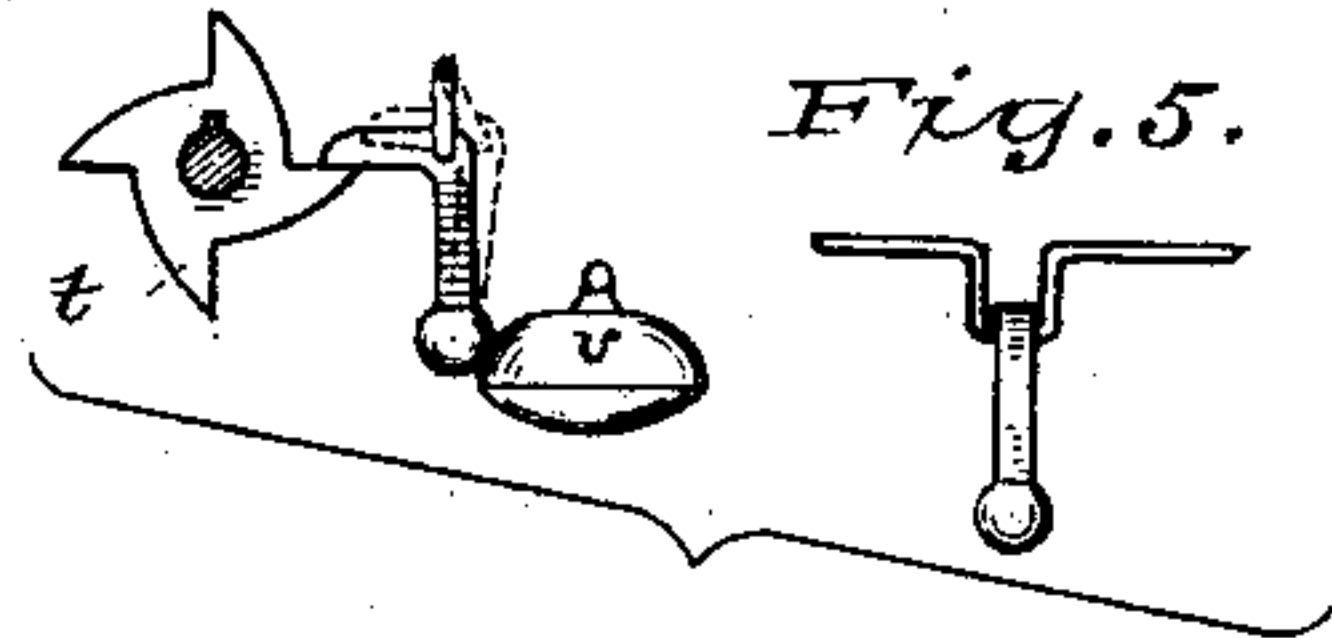


Fig. 6.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN WARREN COLBY, OF PENACOOK, NEW HAMPSHIRE, ASSIGNOR OF ONE-FOURTH TO CHARLES A. COTTERILL, OF WASHINGTON, DISTRICT OF COLUMBIA.

MECHANICAL TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 371,551, dated October 18, 1887.

Application filed April 11, 1887. Serial No. 234,458. (No model.)

To all whom it may concern:

Be it known that I, JOHN WARREN COLBY, a citizen of the United States, residing at Penacook, in the county of Merrimac and State of New Hampshire, have invented certain new and useful Improvements in Telephones; 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 telephones.

In the accompanying drawings I have shown my improvements as applied to a mechanical telephone—that is, one in which the sounds themselves are propagated along a wire or similar conductor.

The object of my invention is to make certain improvements in the general construction of this class of instruments, whereby the transmission or reproduction of sounds or articulate speech will be more nearly perfect and the operation of the devices more reliable.

My invention consists in the details of construction, hereinafter fully described, and pointed out in the claims.

In the drawings referred to, in which like symbols of reference designate corresponding parts in the different figures, Figure 1 is a top view of the instrument or transmitter, a part of the lid being broken away to disclose the interior. Fig. 2 is a cross-sectional view taken on a plane indicated by the line *x x*, Fig. 3. Fig. 3 is a sectional view taken on a plane indicated by the line *y y*, Fig. 2. Fig. 4 is a detail view illustrating an improved knocker or signaling device; Fig. 5, a modification of the means for signaling, and Fig. 6 a sectional view of the sound-wave rotator.

The letter A designates the box or case for containing the diaphragm and contiguous parts. This box is constructed as usual, and is provided with a hinged cover or lid, B, having an opening, B', for the passage of sound-waves into the box. In the bottom of the box I place a block, C, having a large semi-spherical socket, *d*, in its upper side. This block is covered partially or entirely with a soft fabric or material, *e*—as, for example, velvet. This soft fabric or soft material *e* is a poor conductor of sound, and therefore aids in confin-

ing the sound-waves within the space containing the diaphragm. On the upper end of the block, around the edge of the socket, is secured a diaphragm, *g*, of skin or equivalent material, and on the top of this is placed a ring, *i*, of metal, provided with tubular standards or posts *m*.

Another diaphragm, or (as I shall term it) “sound-wave deflector,” composed of one or more disks of metal, with radial leaves inclined to the plane of the disk, is arranged above the diaphragm *g* and immediately beneath the opening B'. This sound-wave deflector is secured to an open frame or plate, *h*, provided with pins *n*, fitting and extending into the tubular posts *m*. Helical springs *o* are interposed between the open plate or ring *i* and frame *h*. These springs surround the posts *m* and pins *n*, and tend to separate the sound-wave deflector and diaphragm *g*.

The sound-conducting wire *w* is connected with the diaphragm *g* by means of a button, *v*, which is made of such size that it will not pass through the hole made for the passage of the wire *w*. The button *v* is preferably connected with the plate or frame *h* at its under side by a yielding connection—as, for example, by a series of links constituting a small chain—so that it will be kept taut by the springs *o*.

A knocker or signaling device consisting of a flat spring, *s*, having one end bent, as indicated at *s'*, is fixed at the opposite end on the block C. This spring is arranged so that it may be engaged by the teeth of a wheel, *t*, on a rotatable shaft, *t'*, to cause the spring to vibrate and knock against the button *v* in the diaphragm *g*, and thus transmit a signal. The shaft *t'* is provided with a crank, *u*, with which it may be conveniently rotated.

In order to provide against injury to the apparatus by persons not familiar with its use, the bent portion *s'* of the flat spring *s* is made so that the wheel *t* may be turned in the wrong direction without injury, as clearly shown in Fig. 4.

In Fig. 5 I have illustrated a modified form of knocker, which consists of a weighted bent lever swinging on a rod extending across the box in a direction parallel to that of the shaft

t'. In order to prevent the movement longitudinally of this weighted bent lever, a rectangular bend is made in the rod and the bent lever is pivoted therein, as shown in Fig. 5.

5 The sound-wave deflector D, which I have described in more general language, consists, preferably, of two or more superposed disks of metal slit radially to form radial leaves, each of which is bent on its axis, so that it lies
10 in a plane at angles to the plane of the disk. These leaves cause the sound-waves to be deflected into the box, and their general direction on entering will be inclined to the plane of the disks. This construction tends to con-
15 fine the sound-waves within the box.

An additional feature of my present improvement consists in providing the conducting-wire with a tube containing a liquid, as illustrated in the lower portion of Fig. 3. In
20 this figure the letter *r* represents the tube which surrounds the wire, stoppers *r'*, of any suitable material, being provided to close the ends. This forms a liquid casing about the conductor, which has the effect of preventing
25 the ringing usual in such wires and rendering the sound more smooth. Any number may be provided at suitable points on the wire.

The advantage gained by making the large socket or concavity in the upper side of the
30 block C is that the sound will be confined to a smaller space.

I do not limit myself to the exact construction of parts shown in the drawings, as they are susceptible of modification and still be within the
35 scope of my invention; nor do I limit myself to the employment of all the features of my said invention in mechanical telephones alone, as some of them may be found useful in electrical telephones.

40 What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a telephone, the combination, with a transmitter, of the herein-described sound-wave deflector, consisting of one or more disks
45 having a series of radial leaves inclined to the general plane of the disk, substantially as shown.

2. In a telephone, the combination, with the box or case and a cover therefor having an opening, of the herein-described sound-wave
50 deflector, consisting of one or more disks having a series of radial leaves inclined to the general plane of the disk, substantially as shown, the said sound-wave deflector being arranged near the opening, as set forth. 55

3. In a telephone, the combination, with the box or case, the diaphragm *g*, secured therein, and a line-wire connected with the said diaphragm *g*, of the sound-wave deflector, substantially as herein described, yieldingly sup-
60 ported above the said diaphragm *g*, as set forth. 65

4. In a telephone, the combination, with the box or case, the diaphragm *g*, secured therein, and a line-wire connected with the said diaphragm *g*, of the sound-wave deflector, substantially as herein described, yieldingly sup-
65 ported above the said diaphragm *g*, and means, substantially as shown, for connecting said sound-wave deflector with the line-wire.

5. The combination, with a telephone trans-
70 mitter and wire, of a tube surrounding the wire, adapted to contain a liquid, and means to prevent the escape of liquid from the tube, substantially as described.

6. The herein-described improved telephone,
75 comprising a box or case having a suitable mouth-piece or opening therein, the block C in the bottom thereof, having a semi-spherical socket in its upper side, a diaphragm, *g*, stretched over said socket, a conductor, *w*, con-
80 nected with said diaphragm by means of a button, *v*, and a plate or frame carrying a sound-wave deflector, substantially as described, yieldingly supported above the diaphragm, the said sound-wave deflector or its carrying-
85 frame being connected with the diaphragm, substantially as described.

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

JOHN WARREN COLBY.

Witnesses:

ALBERT STEVENS,
GEORGE A. MORSE.