

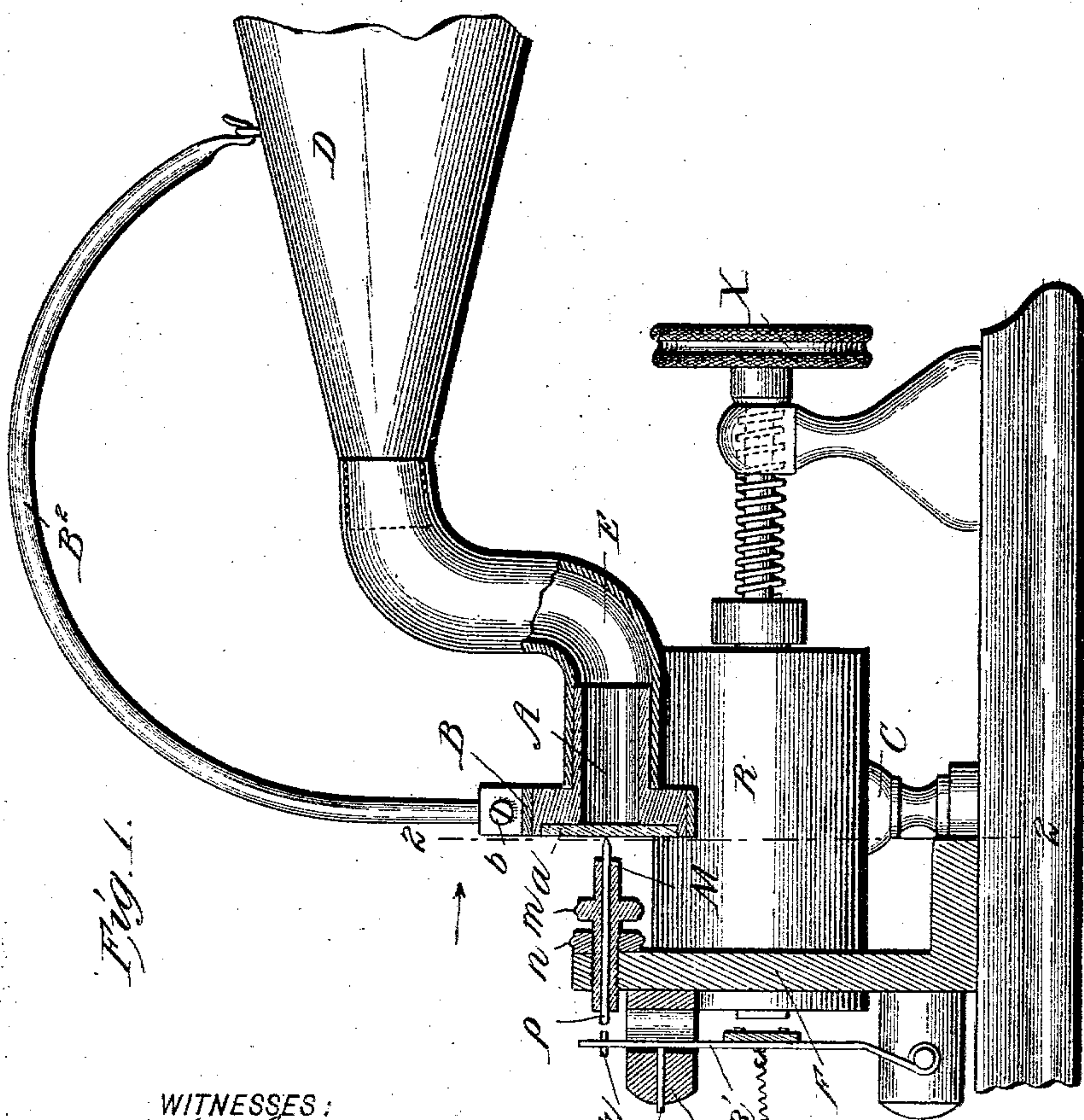
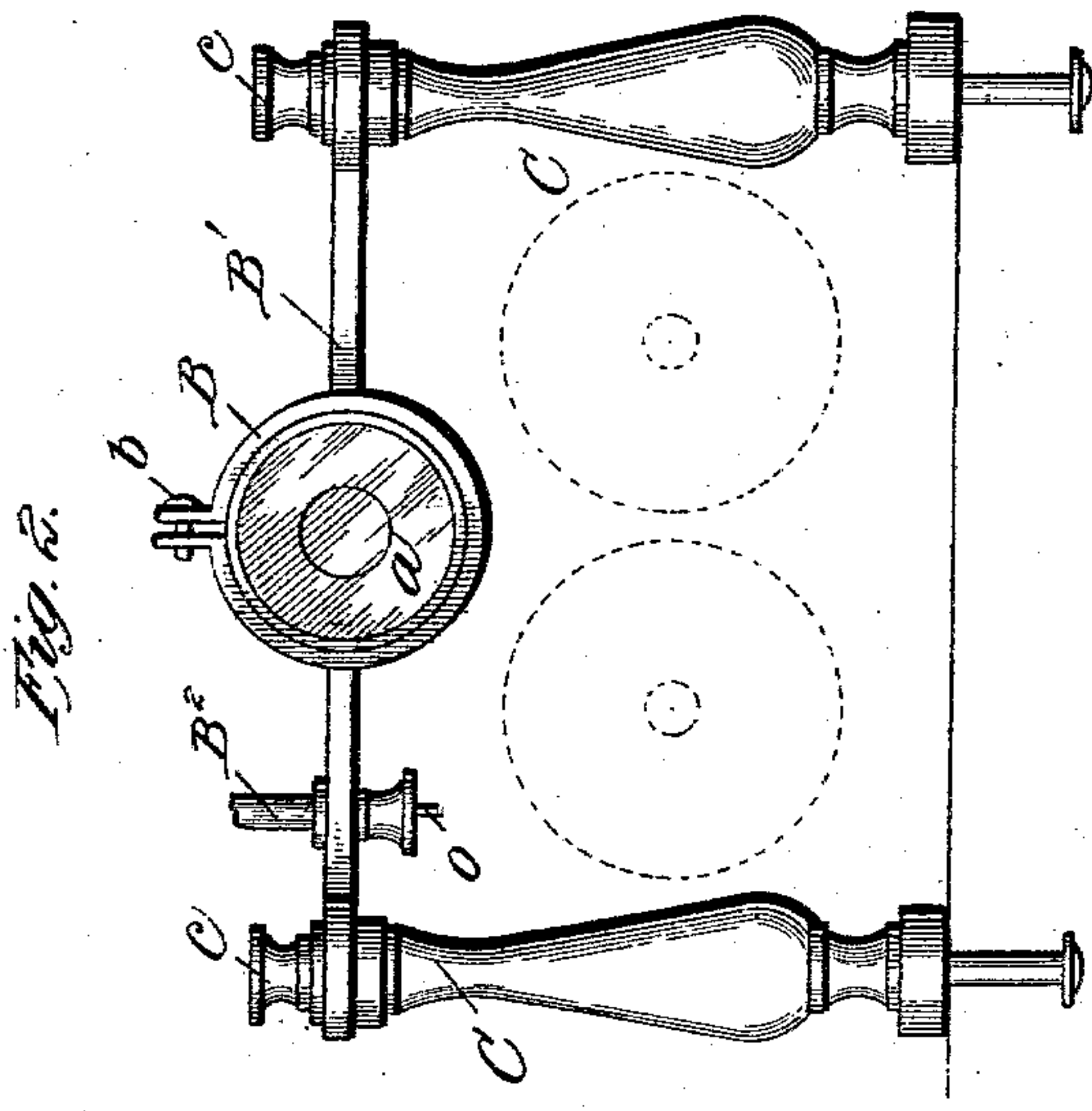
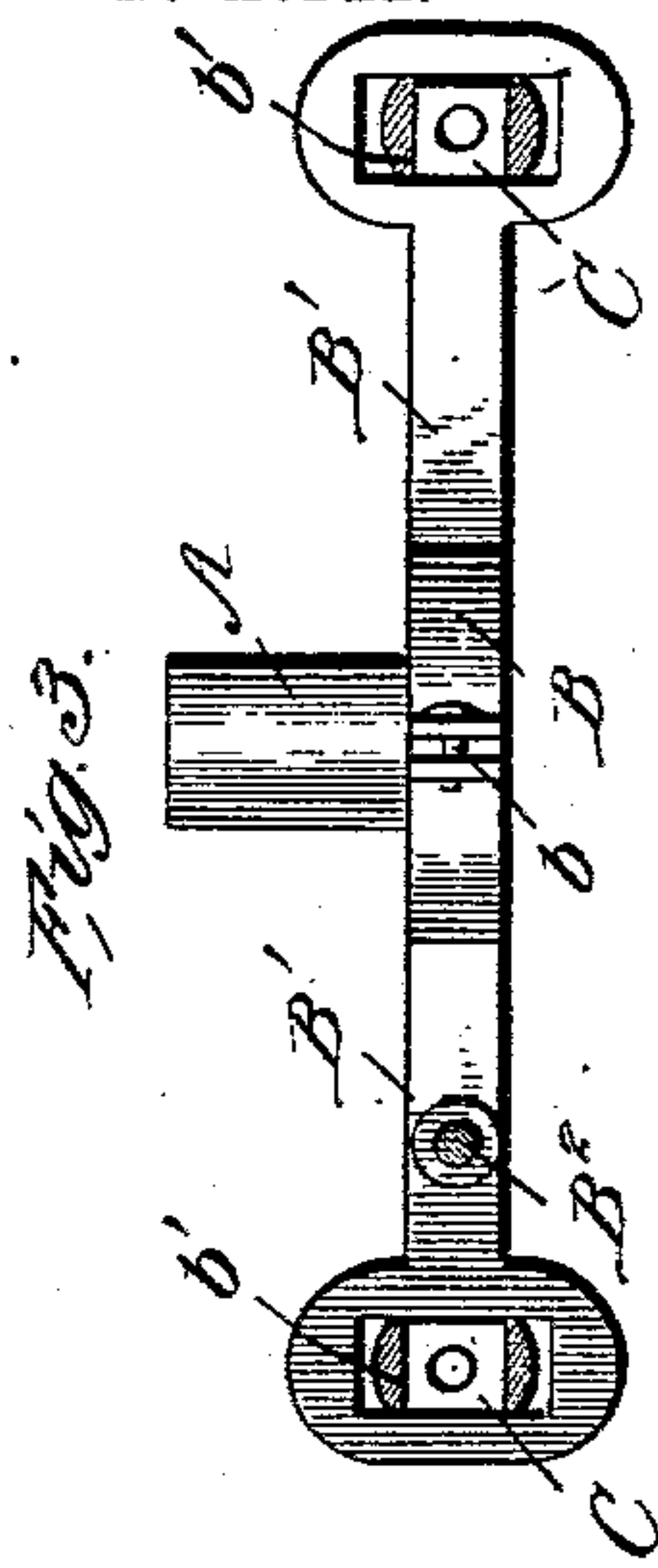
No. 751,982.

PATENTED FEB. 9, 1904.

M. A. HACKER.  
SOUND MAGNIFIER FOR RELAYS.

APPLICATION FILED APR. 28, 1902.

NO MODEL.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

MATT A. HACKER, OF IRVINE, KENTUCKY, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO HIMSELF, JOE S. GARDNER, AND LEONARD A. WEST, OF IRVINE, KENTUCKY, AND COURTLAND P. CHENault, OF FRANKFORT, KENTUCKY.

## SOUND-MAGNIFIER FOR RELAYS.

SPECIFICATION forming part of Letters Patent No. 751,982, dated February 9, 1904.

Application filed April 28, 1902. Serial No. 104,994. (No model.)

*To all whom it may concern:*

Be it known that I, MATT A. HACKER, of Irvine, in the county of Estill and State of Kentucky, have invented a new and useful Improvement in Sound-Magnifiers for Relays, of which the following is a specification.

My invention relates to that form of device which is designed to do away with the local-battery circuit and sounder as ordinarily employed on telegraph-lines and which comprehends means for amplifying the sound of the relay as operated directly by the relatively weak electrical current on the line.

It consists in the peculiar construction and arrangement of said sound-magnifier in combination with the relay, which I will now proceed to describe with reference to the drawings, in which—

Figure 1 is a vertical sectional view through my apparatus; Fig. 2, a view taken on the line 2 2 of Fig. 1 looking in the direction of the arrow and with the position of the relay-magnet shown in dotted lines, and Fig. 3 is a plan view of the parts shown in Fig. 2.

Referring to Fig. 1, R is the relay, which may be of the ordinary construction, mounted upon any suitable base. F is an upright support for one end of the relay, which support has a keeper *k*, within which vibrates the upper extension of the armature R'. This extension of the armature is ordinarily held away from the relay by the usual armature-spring *t* and rests when the circuit is open against a back contact *s* in the keeper. The upper end of said extension is provided with a hammer-pin *r* to cooperate with my improvements. These consist of a glass disk *a*, held in the enlarged head of a sleeve A, which latter receives a flexible tube E, connecting with a tapered horn D. The head of the sleeve A is held in a circular ring-clamp B by means of the tightening-screw *b*, and said ring-clamp is fixed to and suspended by a horizontal cross-bar B' on the tops of two pillars C C, arranged on opposite sides of the relay, as seen in Figs. 2 and 3. The ends of the cross-bar B' are en-

larged and slotted and receive the flattened ends *b'*, Fig. 3, of the pillars C, and the cross-bars and pillars are fixedly held in an adjustable manner by screw-clamps *c*, Fig. 2. The cross-bar B' is also provided with an upright curved supporting-arm B<sup>2</sup>, which supports the horn D, as seen in Fig. 1. Immediately in front of the glass disk *a* and bearing against its center is arranged a tappet-pin *p*, whose opposite end is in alinement and range of contact with the hammer-point *r* of the armature extension, so that when the armature is drawn forward by the relay it will deliver a blow upon the tappet-pin *p*, which will in turn be transmitted to the glass disk *a*. This tappet-pin *p* slides freely in a tube M, having a milled flange *m* and having one end screw-threaded exteriorly and meshing with an internal screw-thread formed in the upper end of the upright frame-standard F. A check-nut *n* on the screw-threaded portion of the tube bears against the side of the standard F and holds the tube and its tappet-pin to a fixed position, which position, however, is by these instrumentalities made adjustable, so as to increase or diminish the distance between the end of the tappet-pin *p* and the armature-hammer *r*.

From this description it will be seen that when the relay is energized by an electric impulse and its armature is drawn toward the same its hammer is made to strike the tappet-pin *p*, and this in turn transmits the impact to the glass disk *a*. This disk, acting as a sound-diaphragm, causes sound-waves to be transmitted through the horn, which are so amplified or increased in energy as to make a very clear and loud click, which may be distinctly heard and which by the horn may be concentrated in any direction, so as to involve a minimum of disturbance to other operators. The direction in which the horn points may be changed at will by simply loosening the nut *o*, Fig. 2, and rotating the support B<sup>2</sup> about its vertical axis and then again tightening the nut *o* to fix its position again.

The relay R is adjustable to or from its ar-



mature by the screw X, and the distance between the hammer *r* and tappet-pin *p* is in like manner adjusted by the screw-tube M, so as to increase or diminish the amplitude of the blow, and thereby increase or diminish the sound. The position of the magnifier is also changed bodily by the slotted ends of the cross-bar.

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

1. The combination with a relay and its armature; of a sounding-surface, and a loose and freely-sliding pin interposed between the armature and the sounding-surface and transmitting the blow of the armature to the same substantially as described.

2. The combination with a relay and its armature; of a sounding-surface and a loose and freely-sliding pin arranged between the sounding-surface and the armature and means for adjusting the pin in relation to the armature substantially as described.

3. The combination with the relay and its armature; of a sounding-surface having an am-

plifying-horn, an intermediate sliding pin arranged between the sounding-surface and the armature, a tube inclosing said pin and having a screw-threaded outer surface, a screw-threaded standard supporting the same and a check-nut substantially as described.

4. The combination with the relay and its armature; of a headed sleeve having a glass disk attached to the head, and a horn attached to the other end, and a tappet-pin arranged between the glass disk and the armature substantially as described.

5. The combination with the relay and its armature; of a sound-amplifying device arranged above the relay, a cross-bar supporting said sound-amplifying device and having slotted ends, and two pillars supporting the ends of the cross-bar and having screws on top to fix the adjustment of the cross-bar and sound-magnifying device.

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