

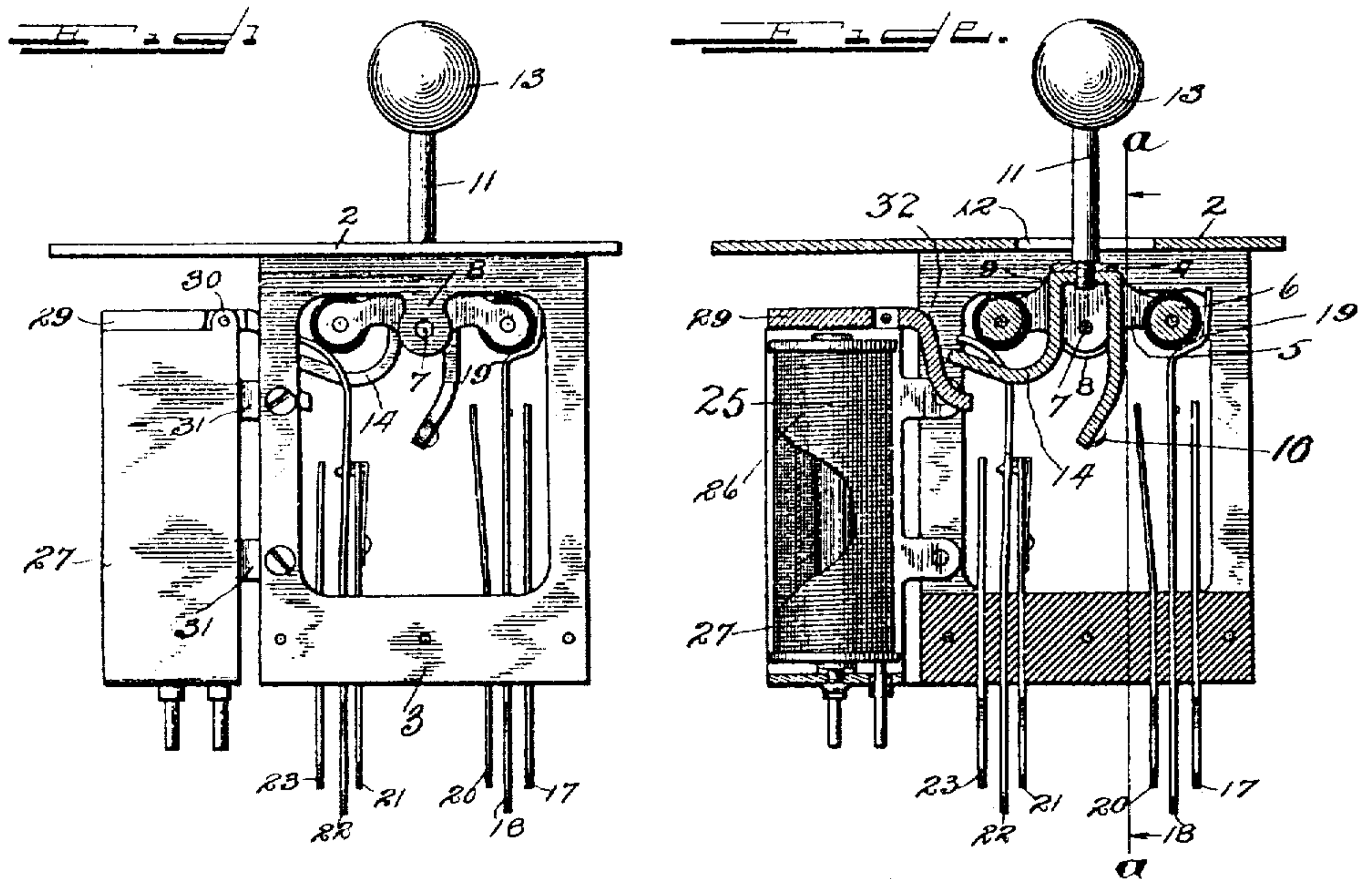
No. 815,405.

PATENTED MAR. 20, 1906.

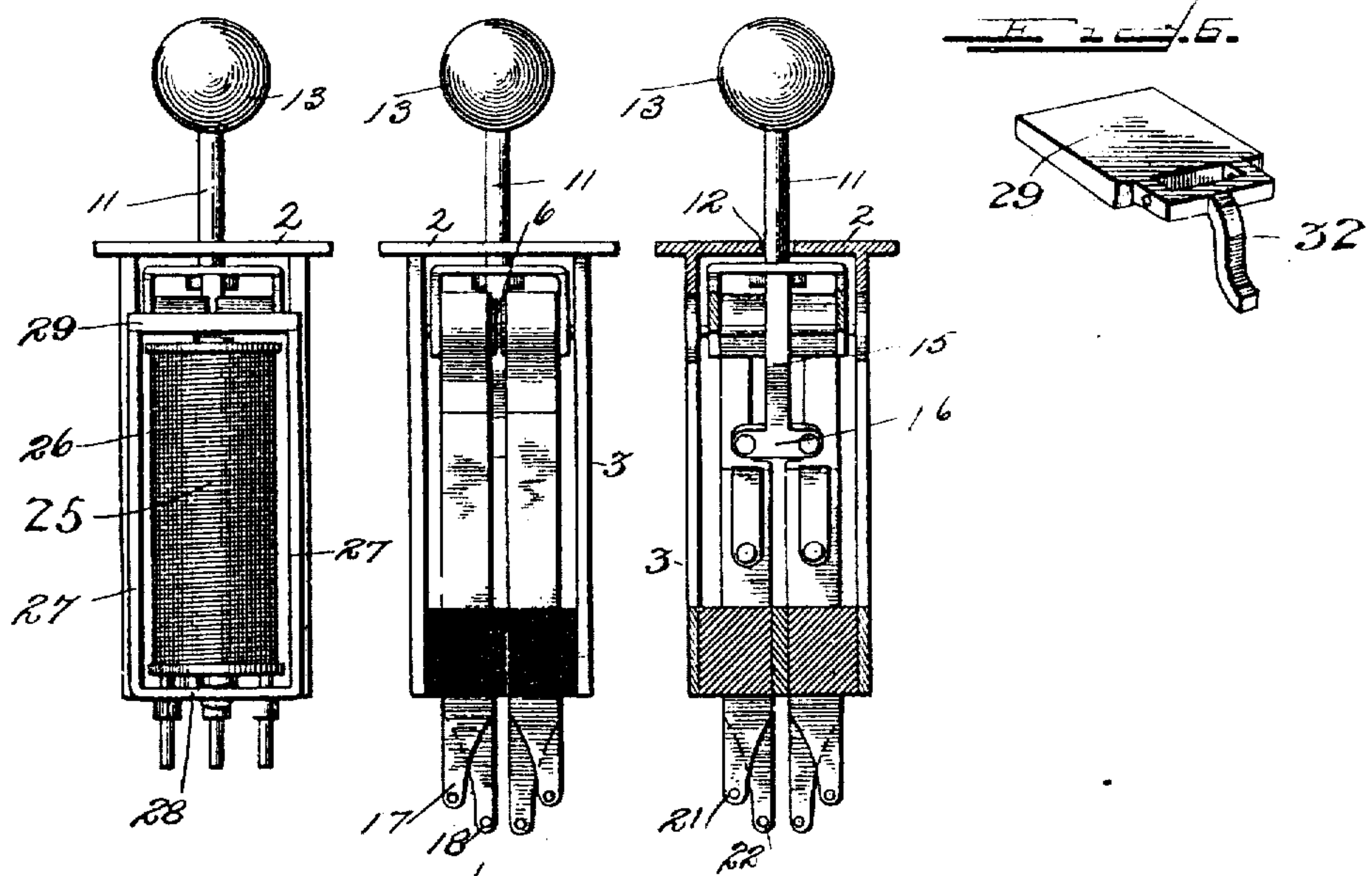
A. CARLISS.

AUTOMATIC RINGING AND LISTENING KEY.

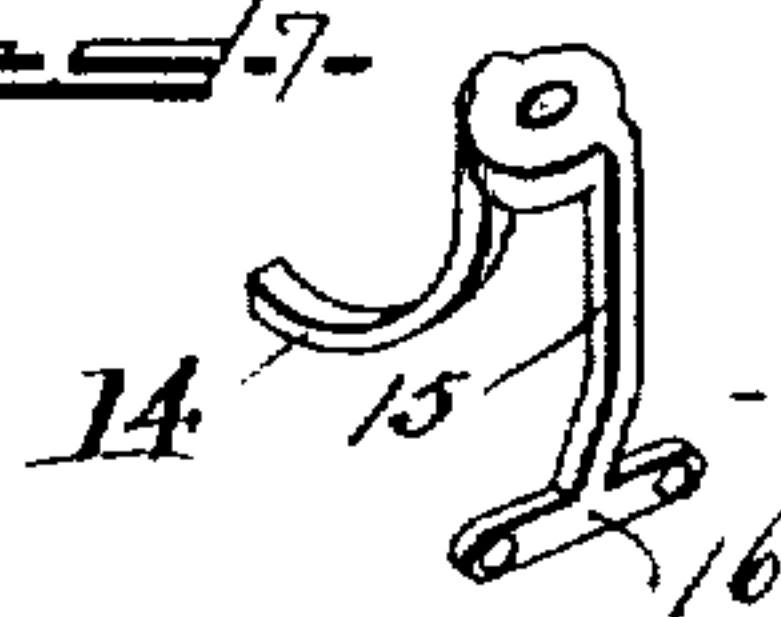
APPLICATION FILED JUNE 20, 1901.



Figures 3, 4, and 5: Cross-sectional views of the automatic ringing and listening key mechanism.



Witnesses
Ora D. Perry
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In Testimony
By Albert Carliss,
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UNITED STATES PATENT OFFICE.

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AUTOMATIC RINGING AND LISTENING KEY.

No. 815,405.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed June 20, 1901. Serial No. 65,240.

To all whom it may concern:

Be it known that I, ALBERT CARLISS, a citizen of the United States of America, and a resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Automatic Listening and Ringing Keys, of which the following is a specification.

My invention relates to improvements in operators' listening and ringing keys, and has special reference to those known as "automatic" ringing-keys, though many of its features may be used to advantage in kindred devices and other relations.

The invention has for its objects the provision of an apparatus of the class described which can be constructed on substantially the same lines as other ringing and listening keys with slight additions that will be simple and comprise few parts, that can be manufactured at slight cost, and one that will be efficient and durable in operation. In accordance with these objects and the invention I provide the key with a top plate having one end of greater length than usual, through a longitudinal slot in which the key-lever projects for the operation of the device. A framework beneath the top plate comprises side members or plates having pivoted between their upper edges the switch-operating frame, to which the key-lever is attached and which carries in horizontal arms small insulating-rollers adapted to act upon the ends of vertical springs or contacts mounted in insulating-blocks secured and clamped between the lower edges of said side plates. A small upright magnet is secured to the side edges of said side plates beneath the extension of the top plate, and its armature is provided with a rearwardly-extending arm, lever, or tailpiece adapted at the proper time to engage and lock a corresponding catch or locking-arm secured to the rocking lever-frame, the same piece having an oppositely-extending arm adapted to cooperate with two of the series of vertical spring-contacts before mentioned on the opposite side of the key from the relay. Means are also provided for securing this arrangement and construction in a simple, cheap, and convenient manner.

The invention further consists in the novel details of construction, parts, and combina-

tion of parts hereinafter described, and particularly pointed out in the claims.

One form of the invention is illustrated in the accompanying drawings, forming a part of this specification, in which the same reference-numerals designate like parts throughout the several views, and in which—

Figure 1 is a side elevation of my device. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is an end elevation of the device from the relay side. Fig. 4 is a similar view from the other side. Fig. 5 is a cross-sectional elevation on the line *a a* of Fig. 2. Fig. 6 is a perspective of the magnet-armature. Fig. 7 is a corresponding view of the lever-locking member.

In the figures, 2 designates the top plate, which is adapted to be secured and set into the keyboard of the switch and through which screws may pass to secure it thereto. The framework beneath the plate comprises the two side frame-plates 3, depending therefrom a suitable distance apart and having pivoted centrally between their upper edges on the pin 7 the rocking or tilting frame of the key-lever, having the flat narrow central web 4 and the vertical horizontal side arms 5 integral therewith, between the ends of which the pairs of insulating-rollers 6 are journaled. The side plates 3 are centrally cut away to leave only a narrow strip about its edges; but the depending lugs 8 remain to support the frame-pivot. Beneath the transverse web the narrow irregular locking member 9 rests, it having a circular horizontal portion located underneath the web 4 of the tilting lever-frame and secured thereto by the rod-handle 11, as shown, the latter extending through a slot 12 in the plate 2 to the upperside, where it is provided with a handle-piece 13 to operate the switch. This locking member is provided on one side with a downwardly and outwardly curved arm 14, passing around and beneath the rollers on that side of the frame, and with a similarly-depending circuit-closing arm 15 on the other, having a T end 16, as shown in Fig. 7. Sets of springs or terminals are vertically mounted on each side of the frame, with their free ends in operative relation, with the two sets of rollers 6 on the key-lever in blocks of insulation clamped between the lower edges of the said plates 3, said springs or terminals extending below the plates for convenient con-

nection with the circuit-wires. On the one side of the key the terminals 17 and 18 are used to connect the operator's telephone with the desired circuit, and owing to the curves 19 in the upper ends of the springs 18 when the key is pressed or thrown to that side it will remain there until manually started back, when the springs will return it to normal position. It will be observed that there are duplicate sets of springs to be used for both sides of the circuit. The springs 20 form terminals of another circuit and are connected together by the cross-arm 16, carried by the arm 15 of the lever when it is moved to the other side. The springs 21 and 22 are in the strands of the cord-circuit or similar circuit and are normally connected together. The springs 23 may be connected with a ringing-generator or other device and are connected with springs 22 when the key is thrown to that side by reason of the curves at the upper ends of the latter, which engage the rollers 6. It is often desired to move the key to that side and have it locked there until certain operations take place, as in ringing a subscriber it may be desired to ring his bell until his response and to thereby automatically disconnect the generator. I provide for such an operation by securing the magnet 25 to the ringing side of the switch and constructing it to control the locking-arm 14 of the key-lever. The specific construction is as follows: The magnet 25 comprises the coil 26, having a central core and a shell of strap-iron having the two side pieces 27 and end piece 28, the latter connecting with the core. With this arrangement the magnet is provided at its upper end with an armature 29, which is pivoted in the ears 30 integral with the side pieces 27. Side lugs 31 are also formed integral with the members 27 and are used to secure the magnets to the side plates 3 of the switch-frame by screws. The armature 29 has a rearwardly and downwardly extending arm 32, the end of which is adapted to catch and lock the arm 14 when the lever is thrown to that side and the magnet 25 is energized. As soon as the magnet is deenergized the arm 14 of the lever slips off the end of armature-tailpiece 32, and the lever is returned to normal position by the springs 22. The terminals of the magnet project below the same and, as shown, are three in number to accommodate an extra winding on the coil for any desired purpose and to be connected in any way. When the key is thrown to the ringing side, the said arm 16 closes an electrical connection through the springs 20.

Although other circuit arrangements could be employed for the devices so far described, I prefer to have the springs 20, which are, when the ringing-contacts are closed, connected together by the cross-arm 16, complete the circuit through the magnet 26, a connection of any suitable character extending from one

of the terminals of the magnet-coil to one of the springs 20, and which may form practically a part of the structure of the said device. The said third terminal extending below the coil, as explained, connects with a resistance-coil that for convenience sake is wound more inductively upon the outside of the other coil, one side of the same being connected with said magnet-coil inside the shell, while the other terminal is extended through the base, as shown, and may be connected with the circuits as desired.

It will be seen that the locking arm or projection 14 extends between the two springs 22, which latter are of course duplicates.

Other forms of the invention could obviously be made and not depart from the scope or purpose of that shown, and I therefore do not wish it to be limited to the precise details shown; but

What I do claim, and desire to secure by Letters Patent, is—

1. In an operator's key, the combination with a top plate having a slot therein, side frame-plates depending therefrom, a frame pivoted between said side plates and having a key-lever projecting through the slot, switch-springs and terminals mounted between said plates and adapted to be operated by said frame when thrown to one side or the other, an electromagnet also mounted on said frame-plates, an arm secured to said frame and extending toward the magnet, an armature for the magnet having a catch adapted to engage said arm when the lever is turned to one side.

2. In an operator's key, the combination with a top plate, depending side plates, a key-lever pivoted between said plates and having a handle portion projecting above the top plate, an arm carried by said lever beneath the plate, a magnet supported beneath the top plate, and an armature therefor having means to lock said arm when desired.

3. In an operator's key, the combination with a top plate, of side plates depending therefrom, a key-lever pivoted between said plates, spring contacts or terminals secured in duplicate sets between said plates and in operative relation to the said key-lever, a locking-arm on said lever extending between the duplicate springs of one set, a magnet mounted on said frame and having an armature, said armature having a locking-arm coöperating with the arm on the lever to lock said lever.

4. In an operator's key, the combination with a top plate, of side plates depending therefrom, a key-lever pivoted between said plates, spring contacts or terminals secured in duplicate sets between said plates and in operative relation to the said key-lever, a circuit-closing arm and a locking-arm carried by said lever, terminals on the one side to be engaged by said arm to close the circuit thereacross, a magnet on the other side hav-

ing an armature provided with a catch to engage said locking-arm.

5 5. The combination of ringing switch-springs, listening switch-springs, a single key for operating said springs, an electromagnet adapted to be controlled by said key, and an armature for said magnet adapted to hold the key in a shifted position while attracted by the magnet, there being suitable provisions whereby the key and the electromagnetically-operated locking means swing or oscillate about separate or non-coincident axes, said axes being parallel.

10 6. In an operator's key, the combination with a top plate, of side plates depending therefrom, a key-lever pivoted between said plates, spring contacts or terminals secured in duplicate sets between said plates and in operative relation to the said key-lever, a locking-arm on said lever extending between the duplicate springs of one set, a magnet mounted on said frame and having an armature, said armature having a locking-arm co-operating with the arm on the lever to lock said lever, there being suitable provisions whereby the key-lever and the electromagnetically-operated locking means swing or oscillate about separate or non-coincident axes, said axes being parallel.

15 7. In an operator's key, the combination with a top plate, of side plates depending therefrom, a key-lever pivoted between said plates, spring contacts or terminals secured in duplicate sets between said plates and in operative relation to the said key-lever, a locking-arm, terminals on the one side to be

engaged by said arm to close the circuit thereacross, a magnet on the other side having an armature provided with a catch to engage said locking-arm, there being suitable provisions whereby the key-lever and the electromagnetically-operated locking means swing or oscillate about separate or non-coincident axes, said axes being parallel.

20 8. The combination of ringing switch-springs, listening switch-springs, a key for operating said springs, an electromagnetic device adapted to be controlled by said key, and adapted when energized to retain said key in a shifted position, there being suitable provisions whereby the key and the electromagnetically-operated locking means swing or oscillate about separate or non-coincident axes, said axes being parallel.

25 9. The combination of a plurality of spring-switches adapted to be employed for controlling a plurality of circuits, a single key for controlling all of said spring-switches, and an electromagnetic device adapted to be controlled by said key, and adapted when energized to retain said key in one of the latter's shifted positions, there being suitable provisions whereby the key and the electromagnetically-operated locking means swing or oscillate about separate or non-coincident axes, said axes being parallel.

Signed by me at Chicago, Cook county, Illinois, this 18th day of June, 1901.

ALBERT CARLISS.

Witnesses:

P. H. CLAUSEN,
A. J. SINCLAIR.