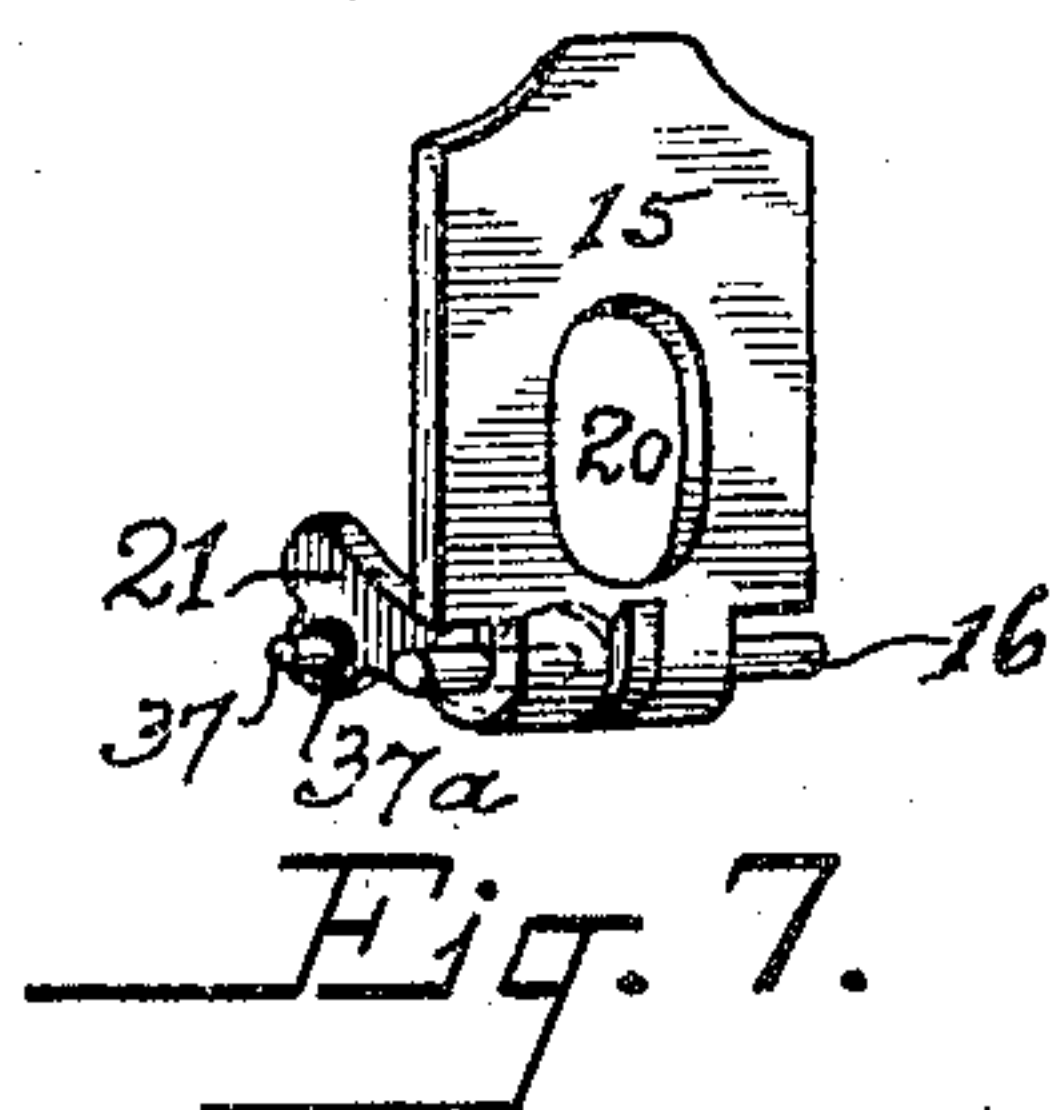
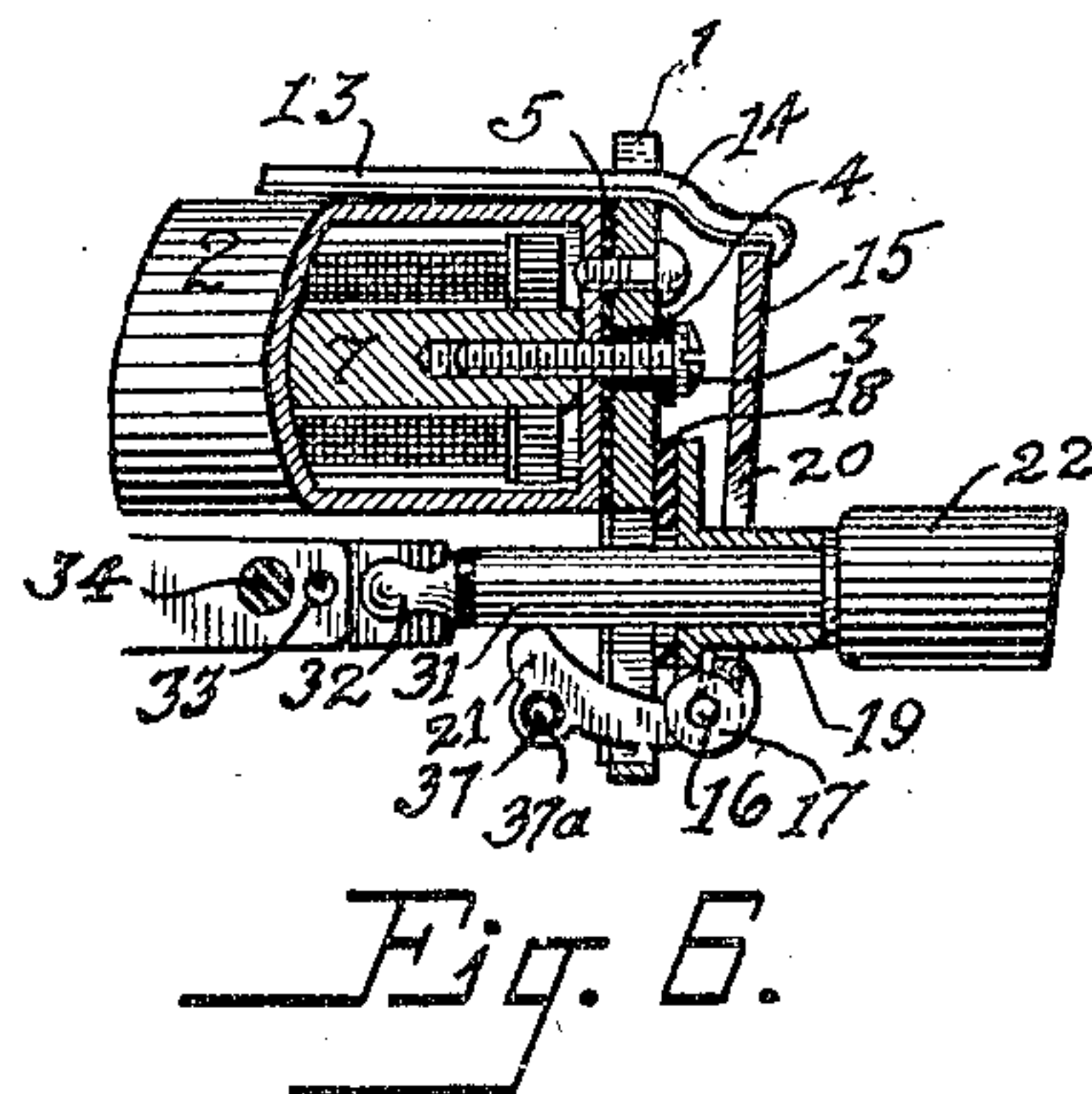
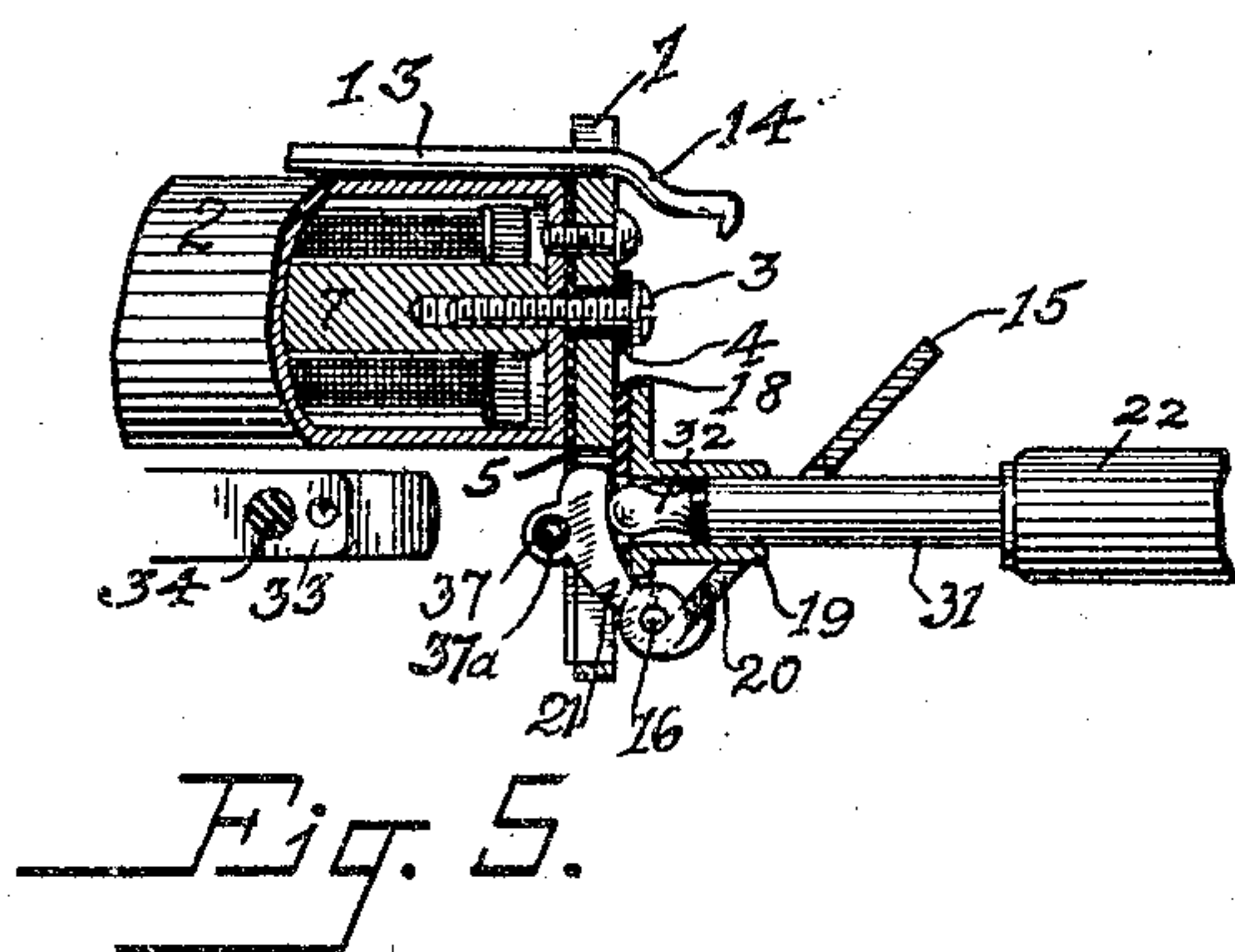
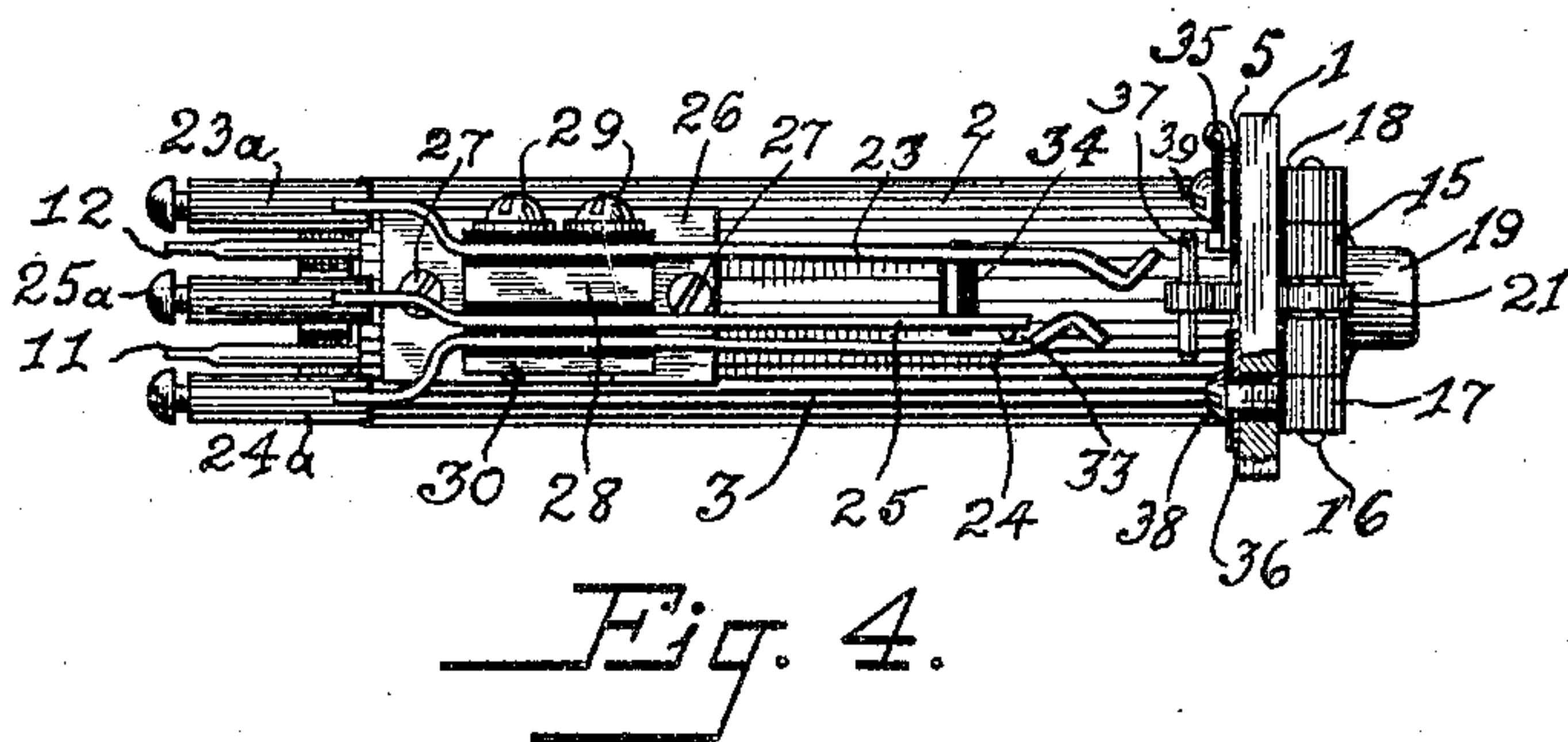
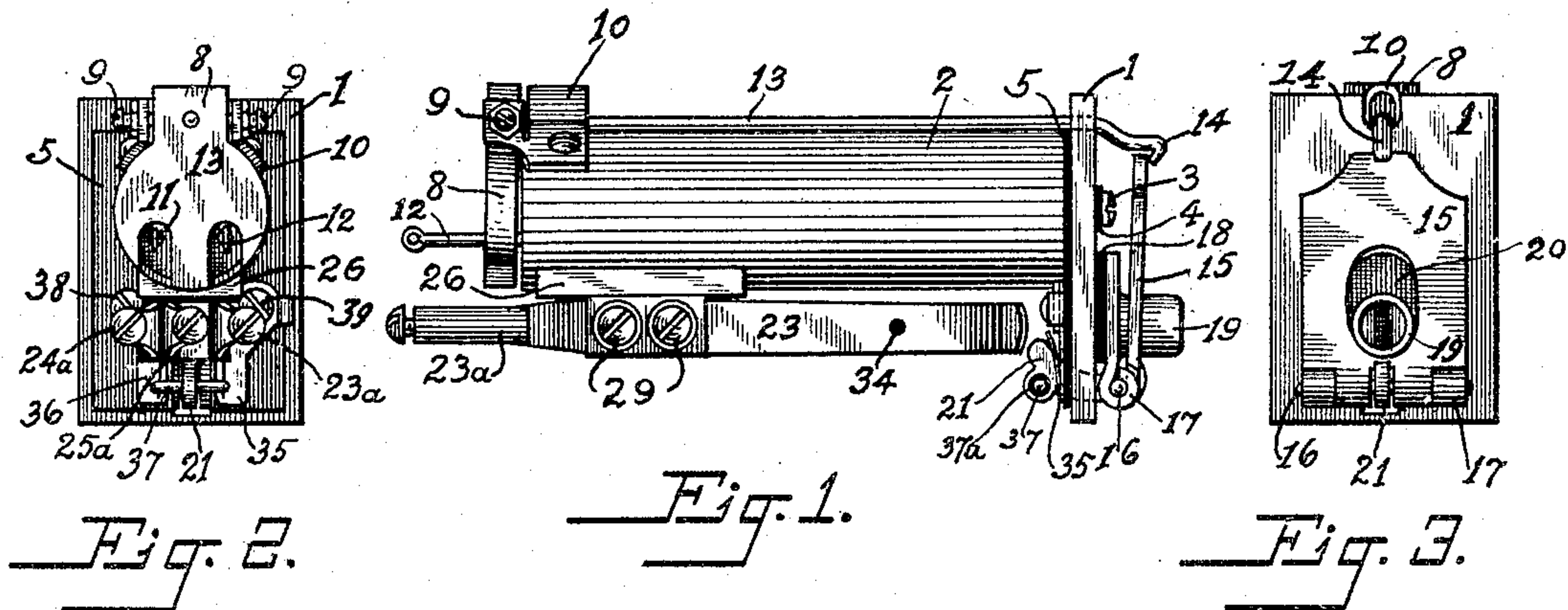


No. 789,188.

PATENTED MAY 9, 1905.

H. TIDEMAN.
COMBINED DROP AND JACK FOR SWITCHBOARDS.
APPLICATION FILED AUG. 13, 1904.



Witnesses.
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UNITED STATES PATENT OFFICE.

HENRY TIDEMAN, OF MENOMINEE, MICHIGAN.

COMBINED DROP AND JACK FOR SWITCHBOARDS.

SPECIFICATION forming part of Letters Patent No. 789,188, dated May 9, 1905.

Application filed August 13, 1904. Serial No. 220,616.

To all whom it may concern:

Be it known that I, HENRY TIDEMAN, a citizen of the United States of America, and a resident of Menominee, county of Menominee, and State of Michigan, have invented a new and useful Improvement in a Combined Drop and Jack for Switchboards, of which the following is a specification.

My invention relates to improvements in drops and jacks for switchboards, and particularly to that type used largely in telephone-switchboards wherein the drop and jack are combined in such manner as to form a unitary piece of apparatus, the arrangement being such that the insertion of a plug into the jack in response to the falling of the corresponding drop will automatically restore the drop to its normal position.

In the accompanying drawings, which form a part of this application, Figure 1 is a side elevation of the complete structure. Fig. 2 and Fig. 3 are respectively rear and front elevations of the same. Fig. 4 is a bottom plan view. Fig. 5 is a side elevation, partly in section, of the front portion of the drop and jack, showing the shutter in its fallen position and about to be restored by the insertion of the plug. Fig. 6 is a similar view showing the plug fully inserted and the drop restored. Fig. 7 is a perspective view of the shutter and a link associated with it.

Referring now to the several figures, the numeral 1 indicates a mounting-plate, preferably of brass or iron, though it may be of insulating material, such as hard rubber or fiber. Upon the upper side of the rear face of this mounting-plate is secured an electromagnet 2, preferably of the well-known tubular type. The screw 3 passes through the mounting-plate 1, through the shell of the magnet 2, into the core 7 of the magnet, serving to bind the core firmly in position in the shell. The screw 3 is insulated from the plate 1 by the insulating-bushing 4 and the drop-shell from the plate 1 by the insulating-sheet 6.

On the rear of the shell of the magnet 2 is movably mounted an armature 8, of iron or other magnetic material, this being pivoted between two trunnion-screws 9 9, carried in a bracket 10, fastened on the rear end of the

shell. Projecting through two slots in the lower portion of the armature 8 are the terminals 11 and 12 of the coil of the magnet, these terminals being in the form of stiff pins rigidly mounted on the rear head of the coil in a manner well understood.

From the upper forward face of the armature 8 extends a lever 13, carrying a latch or hook 14, which serves normally to retain the shutter 15 in position ready to receive a call.

The shutter 15 is pivoted at its lower side on a pin 16, carried in a plate 17, mounted upon but insulated from the mounting-plate 1. This plate 17 is insulated from the mounting-plate 1 by means of the sheet of insulating material 18, which may be of fiber, hard rubber, or other suitable substance.

Rigidly secured to the plate 17 is a tube 19, projecting forwardly therefrom. This forms the tubular or sleeve portion of the jack, and by virtue of the insulating-sheet 18 it is insulated from the mounting-strip 1. This tube 19, which forms a guide for the plug in entering the jack, projects through a hole 20 in the shutter, the hole being of elongated shape and of sufficient size to allow the shutter to have free play on its pivot-pin 16. Pivoted also upon the pin 16, but movable with respect to the shutter 15, is a rearwardly-extending link 21, which is so formed that when the shutter is down it will be moved so that its rear end will lie within the path traversed by the plug in its passage into the jack. This is clearly illustrated in Fig. 5, the plug as a whole being designated by the numeral 22. As the plug passes farther into the jack the link 21 is pushed by it in a downward direction, thus causing the forward end of the link to engage the face of the shutter, as shown in Figs. 5 and 6, and raising the shutter to its normal position, in which it is retained by the latch 14. The position then assumed by the various parts is shown in Fig. 6.

The contact-springs of the jack are numbered on the drawings 23, 24, and 25, respectively. These are mounted on a metallic support 26, secured by screws 27 27 to the lower side of the shell of the magnet 2. This support 26 has a downwardly-projecting lug 28, to which the three jack-springs are secured

by means of screws 29 29, which pass through said springs and said lug and engage threaded holes in a metallic plate 30, which therefore forms a double nut. The several springs are
 5 insulated from each other by flat pieces of hard rubber, fiber, or other suitable insulating material and also by insulating-bushings through which said screws 29 29 pass, this construction being common in the electrical
 10 arts. The spring 23 forms one terminal of the telephone-line and is made longer than the others, so as to engage and form electrical contact with the sleeve 31 of the plug 22 when said plug is inserted into the jack. The spring
 15 24, which forms the other terminal of the telephone-line, is of such length as to engage and form electrical contact with the tip 32 of the plug 22 when said plug is inserted into the jack. By this means the two sides of the line
 20 are continued to the two conductors of the plug-and-cord circuit. The spring 24 normally rests against the spring 25, making electrical contact therewith at the point 33. This contact is broken when a plug is inserted into
 25 the jack, the spring 24 then riding upon the tip 32 of the plug and is pressed thereby out of engagement with the spring 25. By thus breaking the contact 33 when a plug is inserted into a jack the normal circuit from the
 30 line through the coil of the drop is broken, as will be more fully described when the normal circuits of the device are traced. A pin 34, of hard rubber, carried by the spring 23, serves to aid in keeping the springs in their
 35 proper relative positions, and thus to prevent the possibility of an accidental contact between spring 23 and the spring 24 or 25.

The springs 23, 24, and 25 are each provided with suitable terminal-posts 23^a, 24^a, and 25^a,
 40 arranged to facilitate the making of proper circuit connections. When connected for service, the coil-terminal 12 is connected by a wire or other conductor (not shown) with the terminal-post 23^a, and the coil-terminal 11 is
 45 similarly connected with the terminal-post 25^a. Posts 23^a and 24^a form the terminals of the two sides of the metallic circuit-line. The normal circuit of the device may then be traced from one side of the line to post 23^a, to terminal 12 of the electromagnet, thence through
 50 the coil to terminal 11 of the magnet, thence to terminal-post 25^a, to spring 25, contact 33, to spring 24, and thence through terminal-post 24^a to the other side of the line. Current
 55 flowing through this path causes the magnet to attract its armature, thus causing the latch 14 to release the shutter, which falls into the position shown in Fig. 5. The insertion of a plug in addition to causing the restoration of
 60 the shutter, as already described, severs the circuit through the magnet-coil by breaking contact 33 and also connects the two sides of the line to the cord-circuit.

In order that an aural as well as a visual
 65 signal may be provided for, means are afforded

in my device for closing what is commonly called a "night-alarm" circuit. To this end the springs 35 and 36, which are adapted to form the terminals of the night-alarm circuit, are so mounted on the lower back face of the
 70 mounting-plate 1 as to be normally out of engagement with each other; but their extremities lie within the path of the metal pin 37, mounted transversely in and insulated from the link 21, so that when the shutter falls and
 75 the link is moved from its normal position the two springs will be brought into engagement each with the pin 37 and will therefore be electrically connected to each other. The pin 37 is insulated from the link 21 by a bushing
 80 37^a. This is most clearly shown in Fig. 7. The spring 36 is secured directly to the plate 1 by means of the screws 38. (Best shown in Fig. 2.) The spring 35 is also mounted on the plate 1, but is insulated therefrom, it being
 85 held from electrical contact therewith by means of the insulating-sheet 5. The screw 39 serves to bind the spring 35 to the plate 1.

When the proper wires of a circuit containing a bell or other signal and a source of current are connected to the plate 1 and the
 90 spring 35, the falling of the shutter will cause the signal to sound.

I do not wish to limit myself in all respects to the exact arrangement and conformation
 95 of parts here shown, as certain modifications might be made without departing from the spirit of my invention.

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

1. In a combined drop and jack, an electromagnet, a shutter, means adapted to release said shutter when said electromagnet is energized, a spring-jack mounted in proximity to said electromagnet, a sleeve for said spring-jack projecting through said shutter, and an arm pivotally mounted and adapted to move into a position behind the opening in said sleeve when said shutter is released and to be engaged by a connecting-plug to restore said
 100 shutter when connection is made with the jack, substantially as described.

2. In a combined drop and jack, a mounting-plate, a shutter pivotally secured on said mounting-plate and adapted to swing downwardly when released, means for releasing said shutter, a jack-sleeve carried by said mounting-plate and projecting forward through an opening in said shutter, and an arm pivotally secured on said mounting-plate and adapted
 105 to move into a position behind the opening in said jack-sleeve when said shutter is released and to be engaged by a connecting-plug to restore said shutter when a connection is made with the jack, substantially as described.

3. In a combined drop and jack, a mounting-plate, an electromagnet carried by said mounting-plate, a shutter pivotally secured on the front of said mounting-plate, means controlled by said magnet for releasing said
 110 shutter when connection is made with the jack, substantially as described.

shutter from its normal position, a spring-jack beneath said magnet, springs for said jack mounted on said electromagnet, a sleeve for said jack carried on said mounting-plate and projecting through an opening in said shutter, and a link member pivoted with respect to said shutter adapted to move in a position between said springs and the opening in said sleeve when said shutter is released, and to be engaged by a plug in its passage into the jack to restore said shutter to its normal position, substantially as described.

4. In a combined drop and jack, a mounting-plate, a tubular electromagnet carried on the rear of said mounting-plate, a shutter pivotally secured to the front of said mounting-plate and adapted to be visible to a telephone operator, a latch controlled by said magnet for releasing said shutter from its normal position, a spring-jack beneath said magnet, a

group of springs for said jack carried by the tubular shell of said magnet, a sleeve for said jack carried on said mounting-plate and projecting forwardly through an opening in said shutter, an arm pivotally related to said mounting-plate and to said shutter, adapted to move into a position behind the opening in said sleeve when said shutter is released, and a plug for engaging said spring-jack, adapted to engage said arm in its passage into said jack to restore said shutter, substantially as described.

Signed by me at Menominee, county of Menominee, and State of Michigan, this 8th day of August, 1904.

HENRY TIDEMAN.

Witnesses:

LEOPOLD JACKMAN,
A. D. GIBBS.