

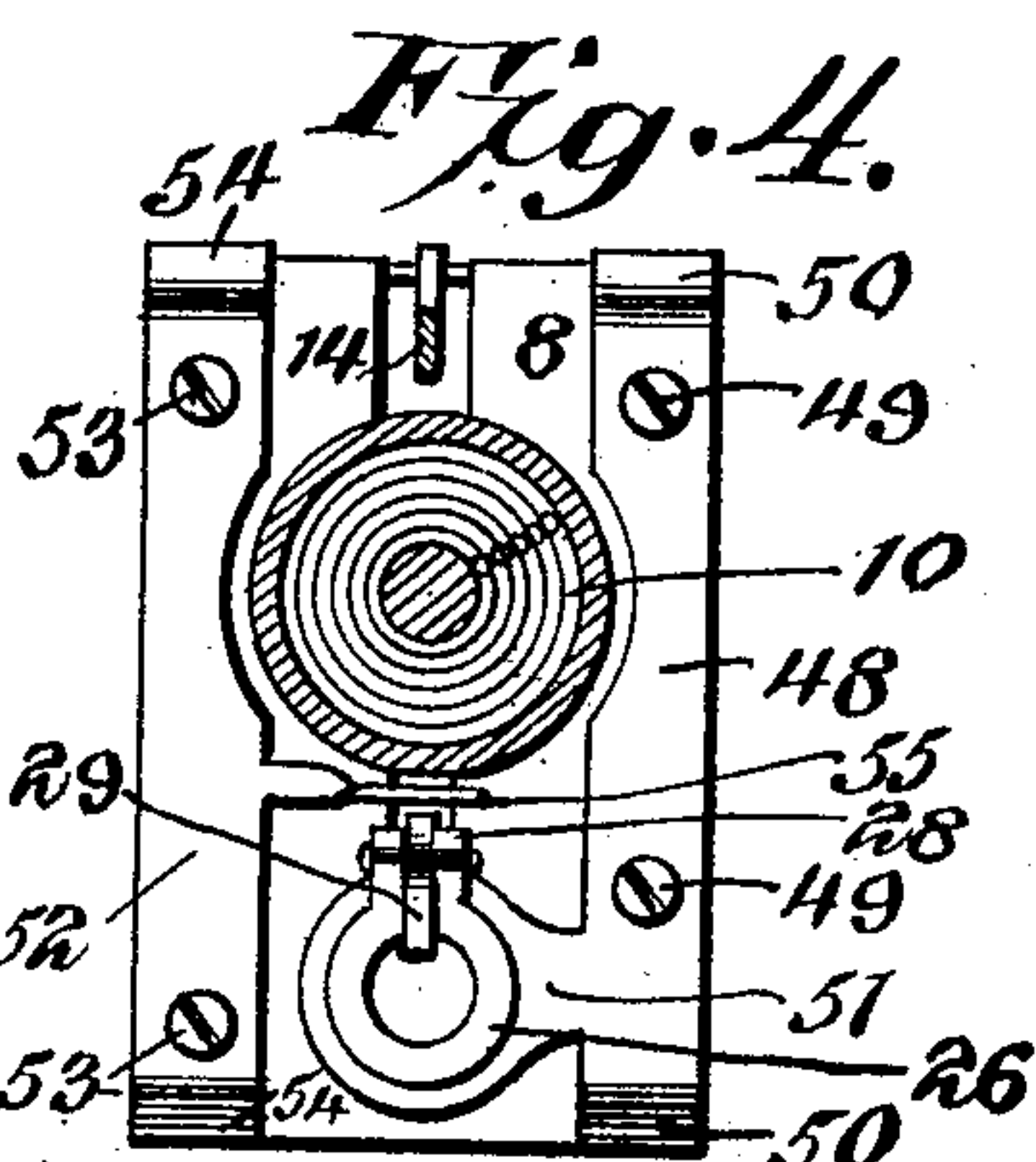
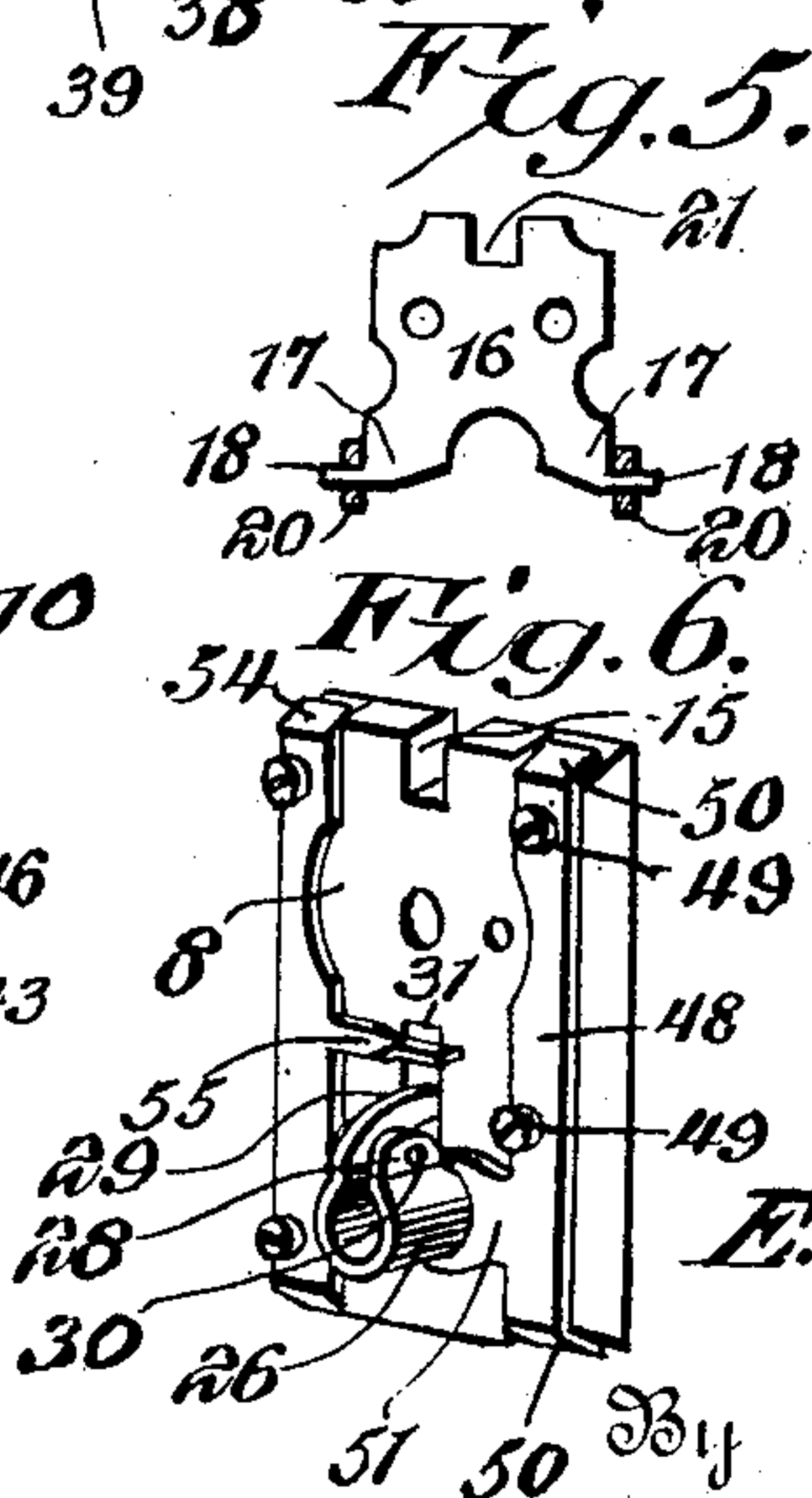
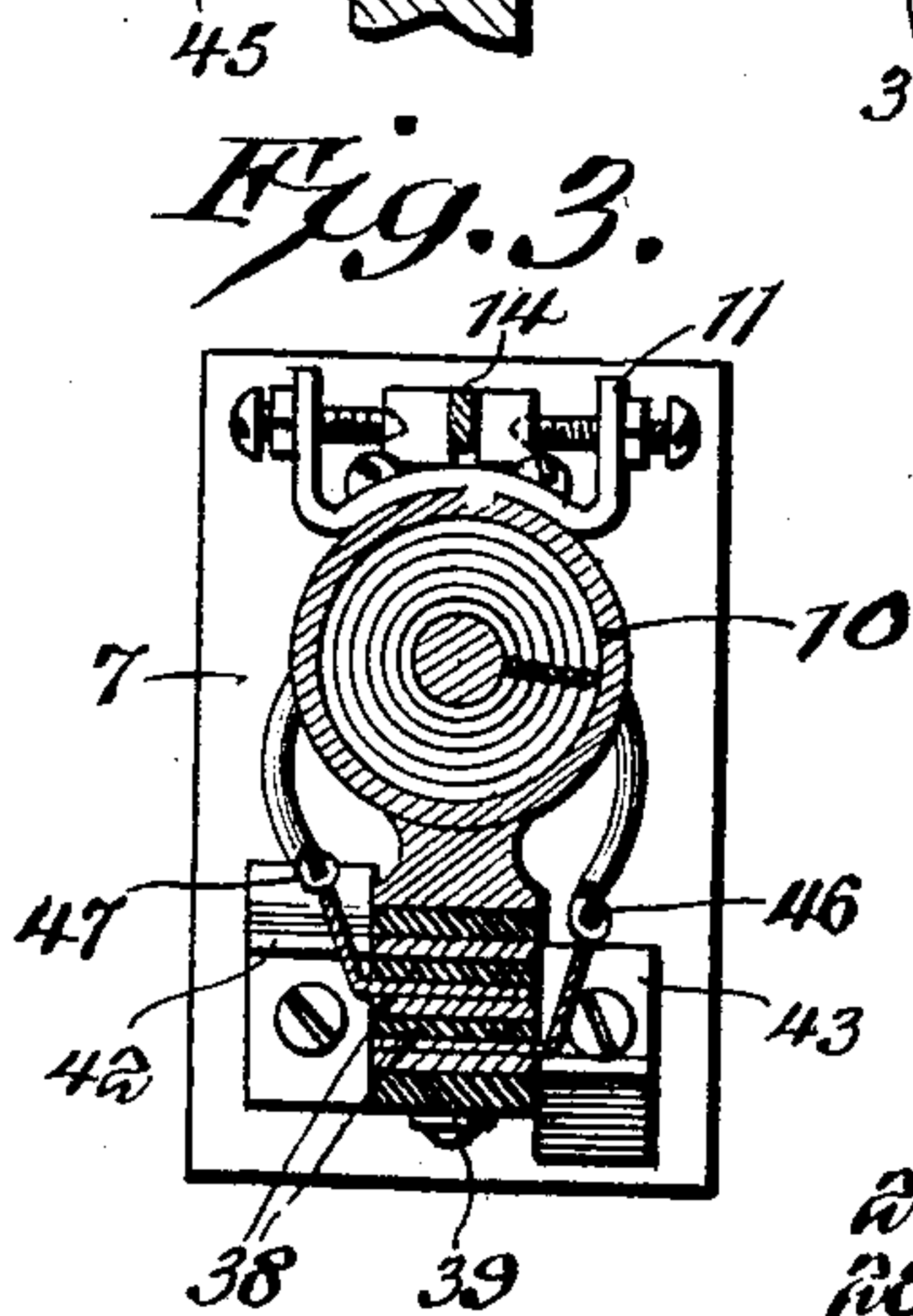
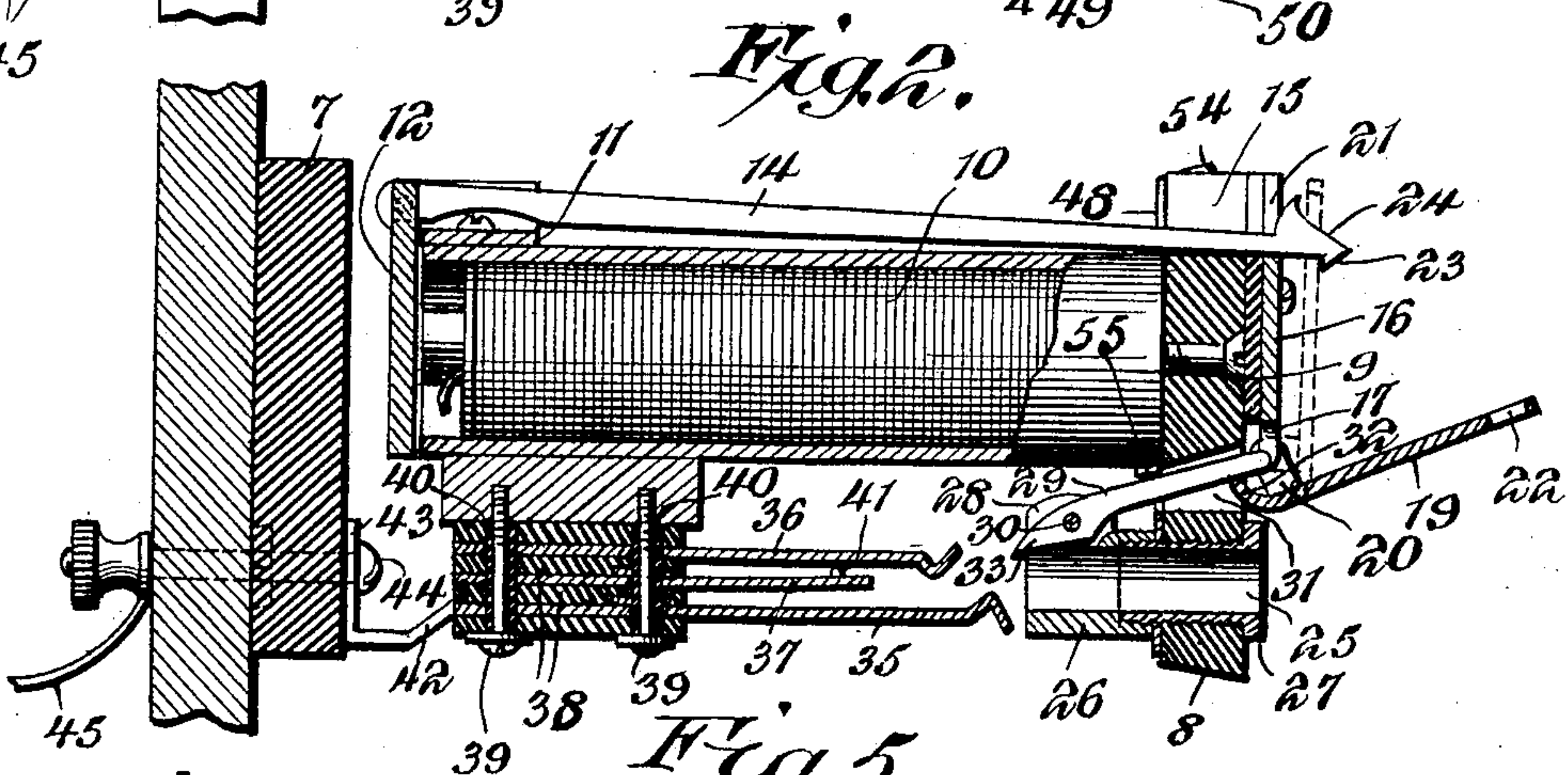
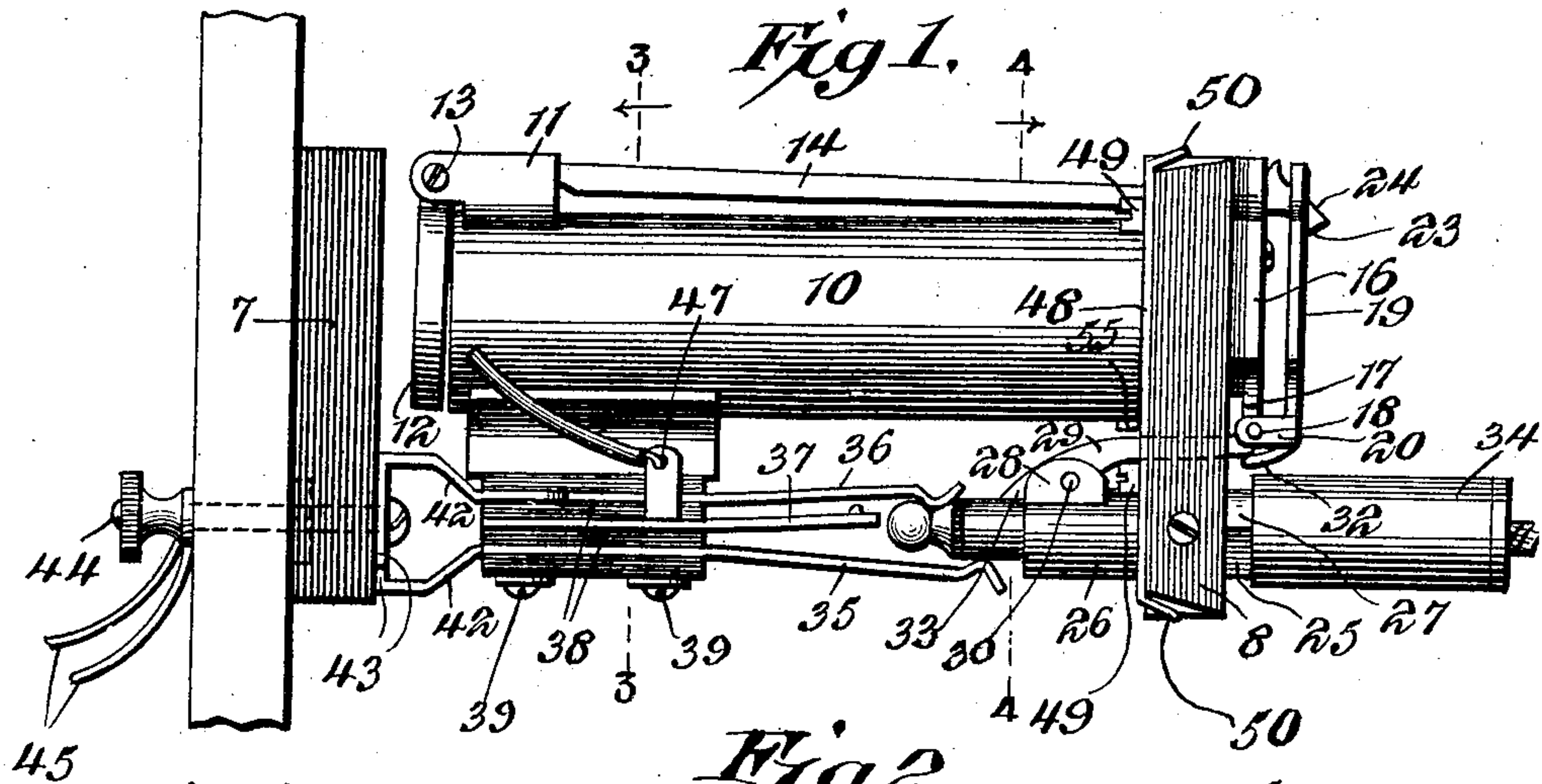
No. 865,379.

PATENTED SEPT. 10, 1907.

E. J. GRENIER.

COMBINED JACK AND RESTORING DROP.

APPLICATION FILED APR. 18, 1906.



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EMADIA J. GRENIER, OF MENOMINEE, MICHIGAN.

COMBINED JACK AND RESTORING-DROP.

No. 865,379.

Specification of Letters Patent.

Patented Sept. 10, 1907.

Application filed April 18, 1906. Serial No. 312,421.

To all whom it may concern:

Be it known that I, EMADIA J. GRENIER, a citizen of the United States, residing at Menominee, in the county of Menominee and State of Michigan, have invented a new and useful Combined Jack and Restoring-Drop, of which the following is a specification.

This invention relates more particularly to combined jacks and restoring drops, and the principal object is to provide novel mechanism, which is very simple and effective, and is not liable to become deranged.

In a more specific aspect, one of the features of the invention resides in the drop or shutter mechanism, whereby the initial movement of the shutter is made positive, thereby avoiding any danger of its not operating when a call is sent in.

Other features relate to improvements in the parts associated with the shutter, and the provision in connection therewith, of a novel and advantageous circuit closer for an aural or night signal.

Still another feature relates to the simplicity of the mechanism as a whole, whereby the parts may be cheaply manufactured and readily assembled, and whereby the mechanism may be readily placed in or removed from the switch board.

The preferred embodiment of the invention is disclosed in the accompanying drawings, wherein, Figure 1 is a side elevation of the same. Fig. 2 is a longitudinal sectional view therethrough. Fig. 3 is a cross sectional view on the line 3—3 of Fig. 1. Fig. 4 is a cross sectional view on the line 4—4 of Fig. 1. Fig. 5 is a detail view, showing the signal plate in elevation, and the ears of the shutter in section. Fig. 6 is a detail perspective view of the rear side of the front supporting block.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated, rear and front supporting blocks 7 and 8 of insulating material are employed. Secured at its front end to the front block by a screw 9 or other suitable fastener, is a magnet 10, arranged between the blocks, and having its rear end spaced from the rear block 7. A bracket 11 is adjustably mounted on the rear end of the magnet, and an armature 12, pivoted, as shown at 13, to the bracket, coacts with the rear end of the magnet. A swinging arm 14 is carried by the armature, and extends longitudinally over the magnet, said arm projecting through a guide slot 15 in the upper portion of the front supporting block 8. A signal plate 16 of bright material, preferably plated, is secured to the front face of the front block 8, and has outwardly extending legs 17 at its lower corners, which legs are provided with oppositely extending pintles 18. A shutter 19, corresponding substantially in size and shape to the signal plate,

but of dark material, has inwardly extending ears 20 at its lower corners, which ears are journaled on the pintles 18, as shown in Fig. 5. The upper portion of the signal plate has a slot 21, in which the arm 14 operates, and the shutter is provided with an opening 22 that receives the outer end of the arm when said shutter is elevated to cover the signal plate. The free end of the arm is provided with a detent or latch in the form of a depending shoulder 23, which shoulder engages over the outer face of the shutter just below the opening 22, when the shutter is raised. The upper side of the arm at its free end is provided with an inclined track portion 24, which extends in rear of the shoulder 23, and is arranged to engage the upper wall of the opening 22, when the arm swings upwardly.

Carried by the lower portion of the front supporting block 8 is a plug-receiving thimble, comprising a pair of plug-receiving sleeves 25 and 26, one of the sleeves, as 25, passing through the block and having an outer annular clamping flange 27, the inner sleeve being threaded upon the inner end of the sleeve 25. Said inner sleeve has a pair of upstanding ears 28, and a restoring trip in the form of a lever 29 is fulcrumed between its ends, as shown at 30 to and between the ears 28. The outer arm of the lever extends through an opening 31 in the block 8, and coöperates with an inwardly extending lug 32, carried by the shutter 19, between the ears 20. The other arm 33 of the trip or lever is arranged to swing into the bore of the plug-receiving thimble, and consequently into the path of movement of a plug, as 34 introduced thereinto.

A set of jack or contact springs is carried by the under side of the magnet. In the embodiment illustrated, outer springs 35 and 36 are disposed on opposite sides of an intermediate contact spring 37, these three springs being held apart by insulating plates 38, and the whole being secured to the magnet by screws 39, passing through insulating sleeves 40. Under normal conditions, the springs 36 and 37 are in electrical contact, as shown in Fig. 2, the latter having a lug 41 engaged by the former. The outer springs 36 and 37 are provided with offset arms 42 that extend rearwardly and have oppositely turned rear terminals 43, forming ears that are disposed against the front face of the rear block 7. Through these ears and through the block are passed binding posts 44, which serve not only to support the entire structure upon the rear block, but also constitutes means for attaching the mechanism to the switch board, and furthermore constitute means for connecting the line wires 45 to the mechanism. The lower spring 35 has an electrical connection 46 with the coil of the magnet, and the intermediate spring 37 also has a connection 47 with the coil, as shown in Fig. 3.

The operation of the structure may be briefly de-

scribed as follows. Under normal conditions, the shutter 19 is elevated, and held by the latch shoulder 23. The springs 36 and 37 being in contact, it will be evident that the magnet 10 is in circuit with the line wires.

5 If, now, a call is sent in, this circuit will be closed, and consequently the magnet will be energized. As a result, the armature 12 will be drawn toward said magnet, and the arm 14 will swing upwardly. This releases the shoulder 23 from the shutter, and at the same time,

10 the inclined track portion 24 engages the upper wall of the shutter opening 22. Consequently, the shutter will be positively thrown outwardly, and this positive initiation of movement insures the quick dropping action on the part of the shutter. The operator thus being notified, introduces the plug 34 into the thimble 25—26,

15 and the inner end of said plug, passing between the springs 35 and 36 spreads said springs apart, thereby causing the spring 36 to disengage from the spring 37, and throwing the magnet out of circuit. At the same

20 time, the rear arm of the restoring trip is elevated, causing a depression of the front arm, which arm striking the lug 32, restores the drop to its initial position. In addition to the visual signal thus provided, an aural or so-called night bell signal may also be employed in which

25 case, a suitable circuit closer can be provided in connection with the mechanism. In the present structure, the following means is preferably employed for this purpose. A current conducting plate 48 is secured to the rear side of the block 8, on one side of the magnet by

30 means of screws 49 or other fasteners. The ends of this plate are offset, as shown at 50 over the top and bottom of the block. An extension 51 is carried by the inner edge of the plate, and is in the form of a collar surrounding the plug-receiving thimble 25—26, and is grounded

35 thereon, so that the restoring trip 29 is thus in electrical connection with the plate. Another current conducting plate 52 is secured by fasteners 53 to the inner side of the block 8, on the opposite side of the magnet 10 to the plate 48, and has upper and lower offset terminals

40 54 that respectively extend over and beneath the block. This plate has an intermediate inwardly extending spring or yielding contact 55 arranged above and in the path of movement of the restoring trip 29. Under ordinary conditions, or when the shutter 19 is elevated, the

45 trip 29 will be out of engagement with the contact 55, as shown in Fig. 1, and therefore, the night bell circuit will be opened. When, however, the shutter is released by a call, the lug 32, striking the outer end of the restoring trip, elevates the same, and thereby brings it

50 into engagement with the contact 55, so that the plates 48 and 52 are electrically connected. These plates are of course in the bell circuit, and said circuit being closed by their connection, an alarm is sounded. The arrangement is exceedingly simple, as will be apparent,

55 and the offset upper and lower terminals of the plates constitute convenient means, whereby the different drops of a switch board may be conveniently connected.

From the foregoing it is thought that the construction, operation, and many advantages of the herein described invention will be apparent to those skilled in

60 the art without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction, may be resorted to without departing from the spirit or sacrificing

65 any of the advantages of the invention.

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

1. In a combined drop and jack, the combination with a support, of a signal plate mounted thereon and having separate outstanding integral pintles on the lower portions of its opposite edges, a shutter coacting with the plate and having inwardly extending ears journaled on the pintles, a latch for holding the shutter over the signal plate, an electro-magnet for operating the latch, and means for restoring the shutter and cutting out the electro-magnet from its operating circuit. 70
2. In a combined drop and jack, the combination with a supporting block, of a shutter pivotally mounted thereon and having an inwardly extending lug, said block having an opening disposed in rear of the lug, a plug-receiving thimble extending through the block, and comprising clamping sleeve sections threaded together and embracing said block, a restoring trip comprising a lever fulcrumed between its ends on the inner section, the outer arm of the lever operating in the opening of the block and bearing against the lug of the shutter, the inner arm being movable into the path of movement of a plug inserted in the thimble, an electro-magnet, a latch for the shutter operated by the magnet, and an electric cut-out disposed in rear of the thimble. 75
3. In a combined drop and jack, the combination with a shutter, of a movable restoring trip coacting therewith, a support for the trip, a current conducting device in constant electrical connection with the support and thereby with the trip, a contact device disposed in the path of movement of the trip and engaged thereby during its swinging movement, an electro-magnetic device controlling the movement of the shutter, and an electric cut-out therefor arranged in rear of the trip. 80
4. In a combined drop and jack, the combination with a block, of separate current conducting devices associated with the block, a sleeve comprising connected sections that clamp the block and one of the current conducting devices between them, a shutter, a trip for the shutter mounted on the sleeve and movable into and out of engagement with the other current conducting device, an electro-magnetic device controlling the movement of the shutter, and an electric cut-out for the device disposed in the path of movement of a plug placed in the sleeve. 85
5. In a combined drop and jack, the combination with a support, of a shutter pivotally mounted thereon, a plug-receiving thimble carried by the support, a restoring trip pivoted on the thimble and coacting with the shutter, a current conducting device mounted on the support and grounded on the thimble, a coacting current conducting device also mounted on the support and having a yielding contact disposed in the path of movement of the trip, an electro-magnetic device controlling the movement of the shutter, and an electric cut-out arranged in rear of the thimble. 90
6. In a combined drop and jack, the combination with a supporting block, of a shutter pivotally mounted thereon, a plug-receiving thimble extending through the block, a restoring trip pivotally mounted on the thimble and coacting with the shutter, a current conducting plate secured to the inner side of the block and having an offset portion clamped by the thimble, another current conducting plate secured to the inner side of the block in spaced relation to the first mentioned trip, and having an offset spring extending above and in the path of movement of the trip, an electro-magnetic device controlling the movement of the shutter, and an electric cut-out for the device disposed in rear of the thimble. 95
7. In a combined drop and jack, the combination with a rear block, of a magnet, shutter mechanism operated thereby, insulated switch springs located on one side of and secured to the magnet, said switch springs having offset arms provided with angularly disposed ears located against one face of the rear block, binding posts passing through the ears and block and projecting beyond the latter for securing the same to a support, said posts constituting means for fastening the ears to the block and thereby supporting the springs, the magnet and the shutter mechanism on said block, and shutter restoring means dis-

posed in advance of the switch springs and actuated by a plug placed between said springs.

5 S. In a combined drop and jack, the combination with a front block, and a rear block, of a magnet secured at its front end to the front block, a shutter pivotally mounted on the front block and having an opening, an armature pivoted on the rear portion of the magnet, and coacting therewith, said armature having a forwardly extending arm arranged to pass through the shutter opening when
10 said shutter is in a predetermined position, a depending detent shoulder carried by the arm and engaging the shutter, an inclined track portion carried by the arm and engaging the shutter when the shoulder is released from said shutter, a sectional plug-receiving thimble passing
15 through the front block, a restoring trip pivoted on the inner section of the thimble and engaging the shutter to swing the same into engagement with the arm, a current

conducting device grounded on the thimble, another current conducting device having a contact spring disposed in the path of movement of the trip, a plurality of insulating contact springs carried by the under side of the magnet, and having their free portions disposed in line with the inner end of the plug receiving thimble, said springs having integral offset arms provided with terminal ears disposed alongside the rear block, and binding posts
20 securing said ears to the block. 25

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

EMADIA J. GRENIER.

Witnesses:

ALBERT MAAS,

WM. VAN DEN BERG.