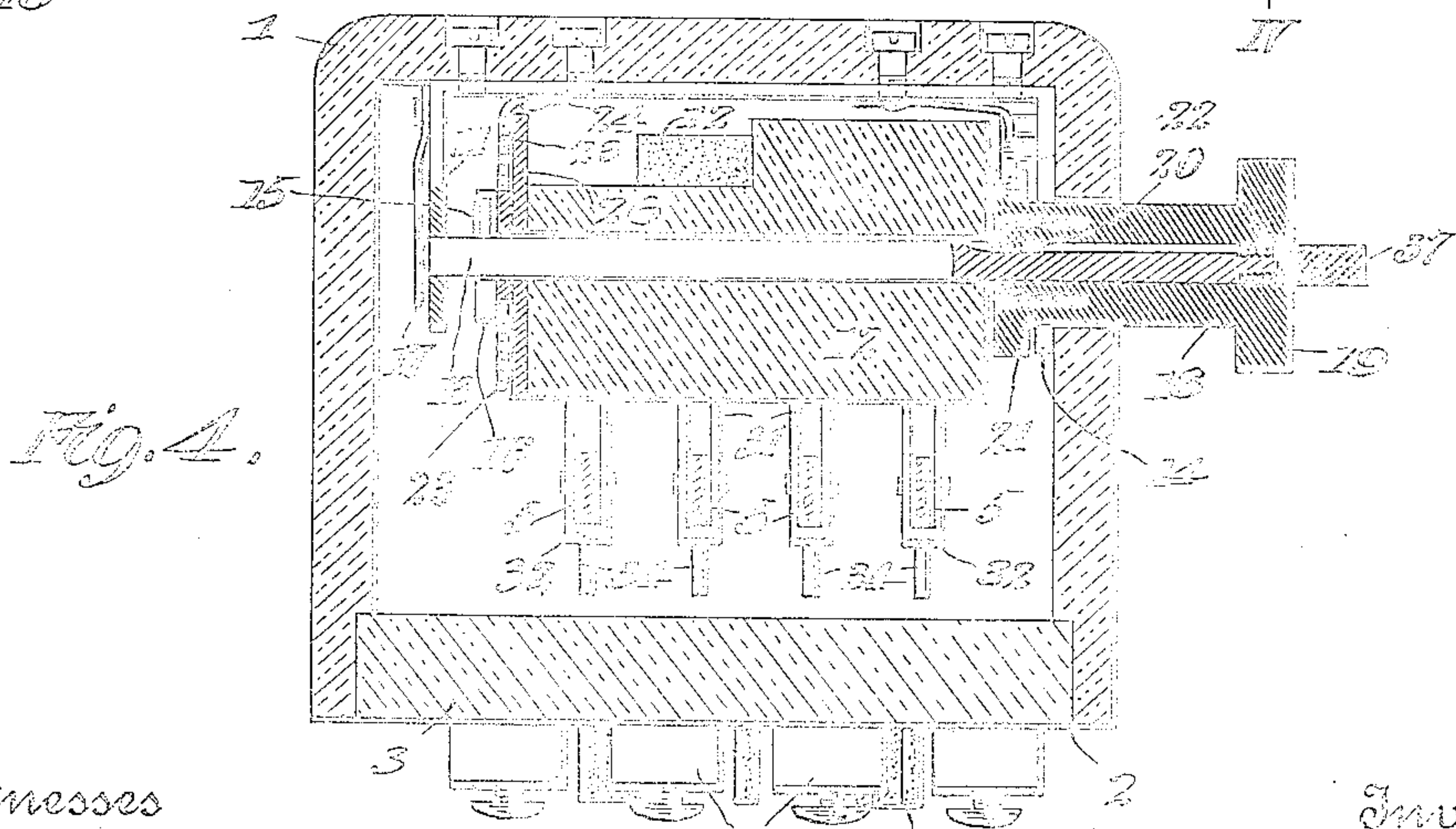
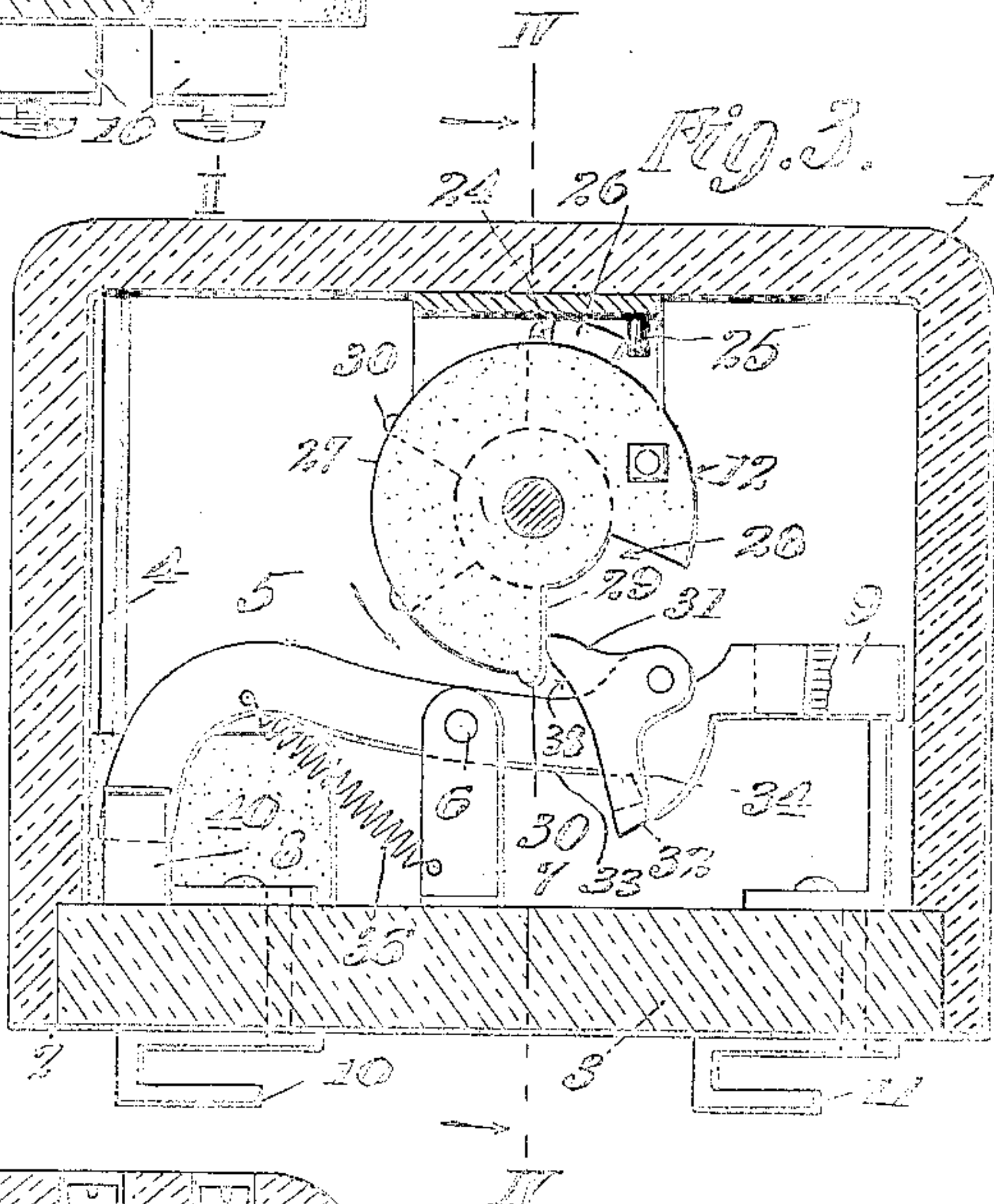
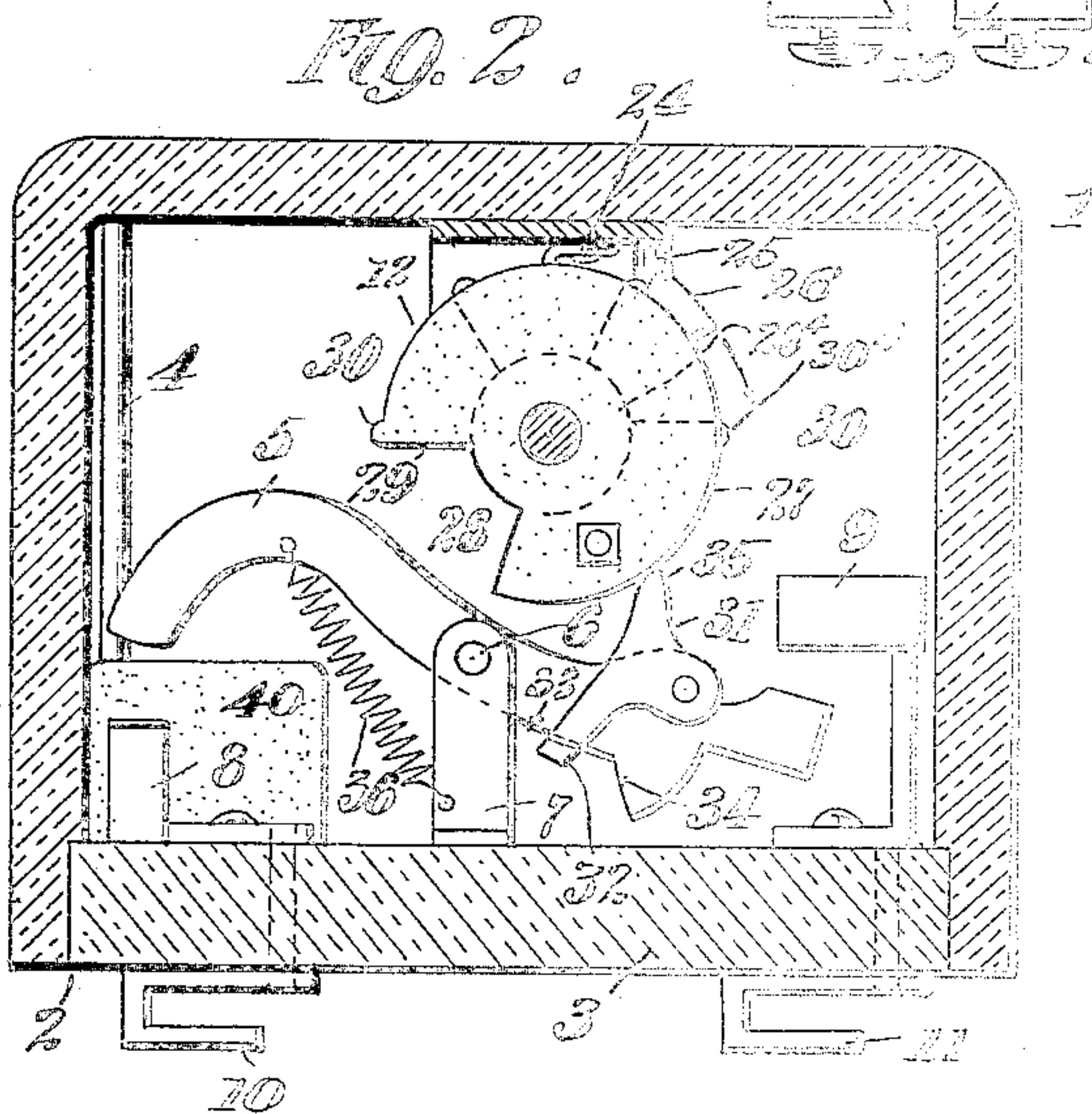
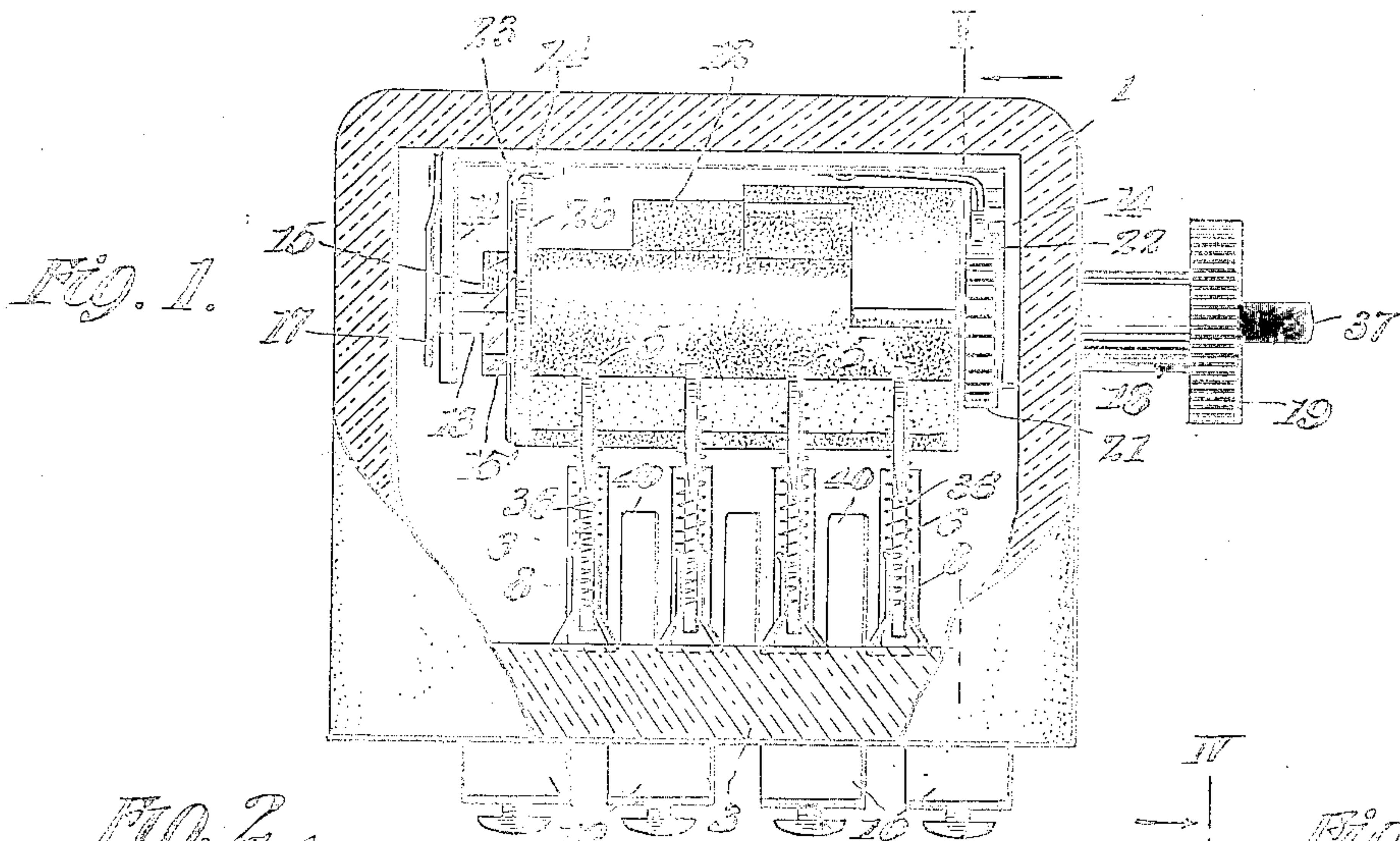


H. J. S. LEWIS.
MULTIPLE ELECTRIC SWITCH.
APPLICATION FILED AUG. 9, 1906.

2 SHEETS—SHEET 1.



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No. 843,902.

PATENTED FEB. 12, 1907.

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2 SHEETS—SHEET 2.

Fig. 5.

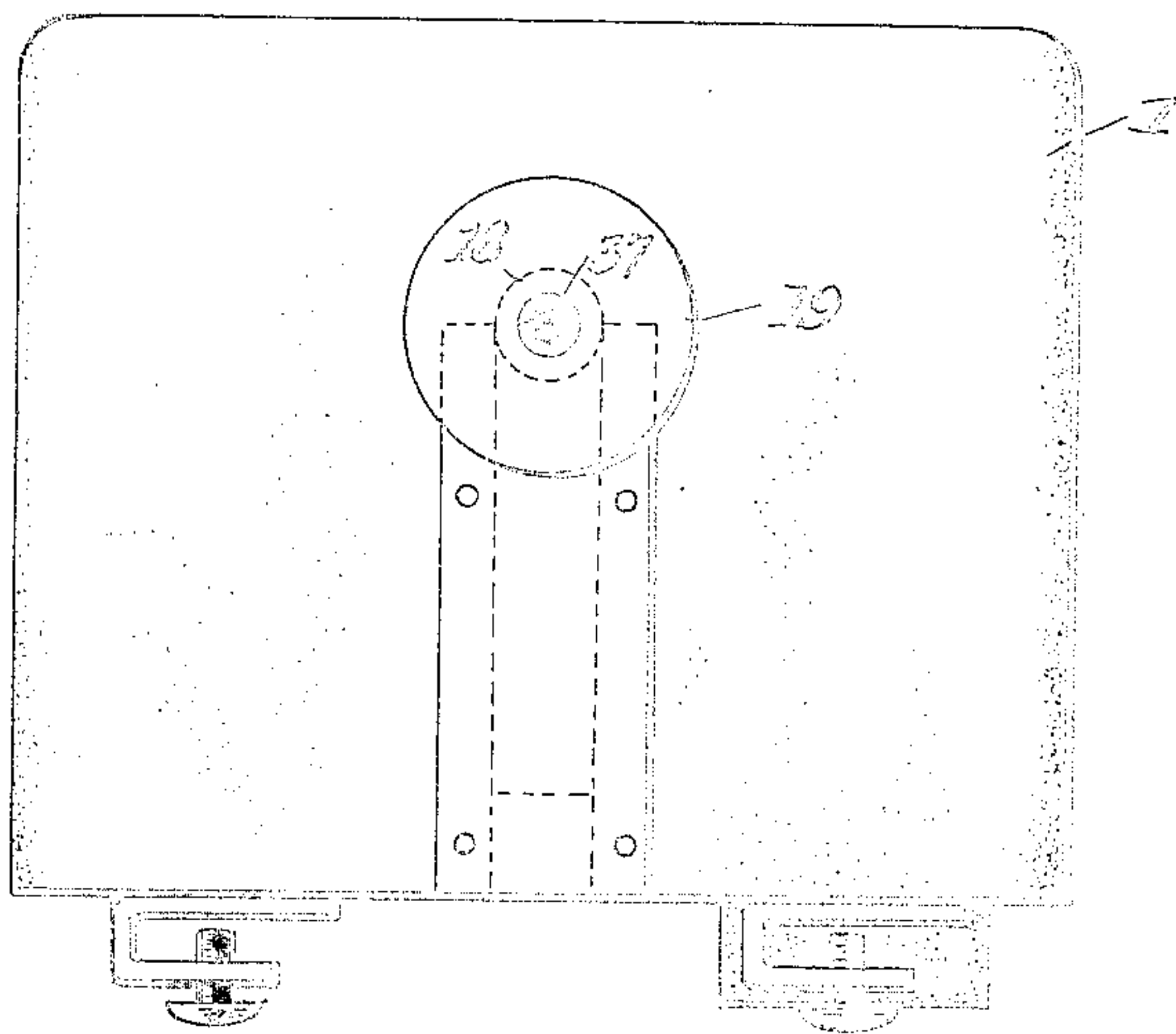


Fig. 6.

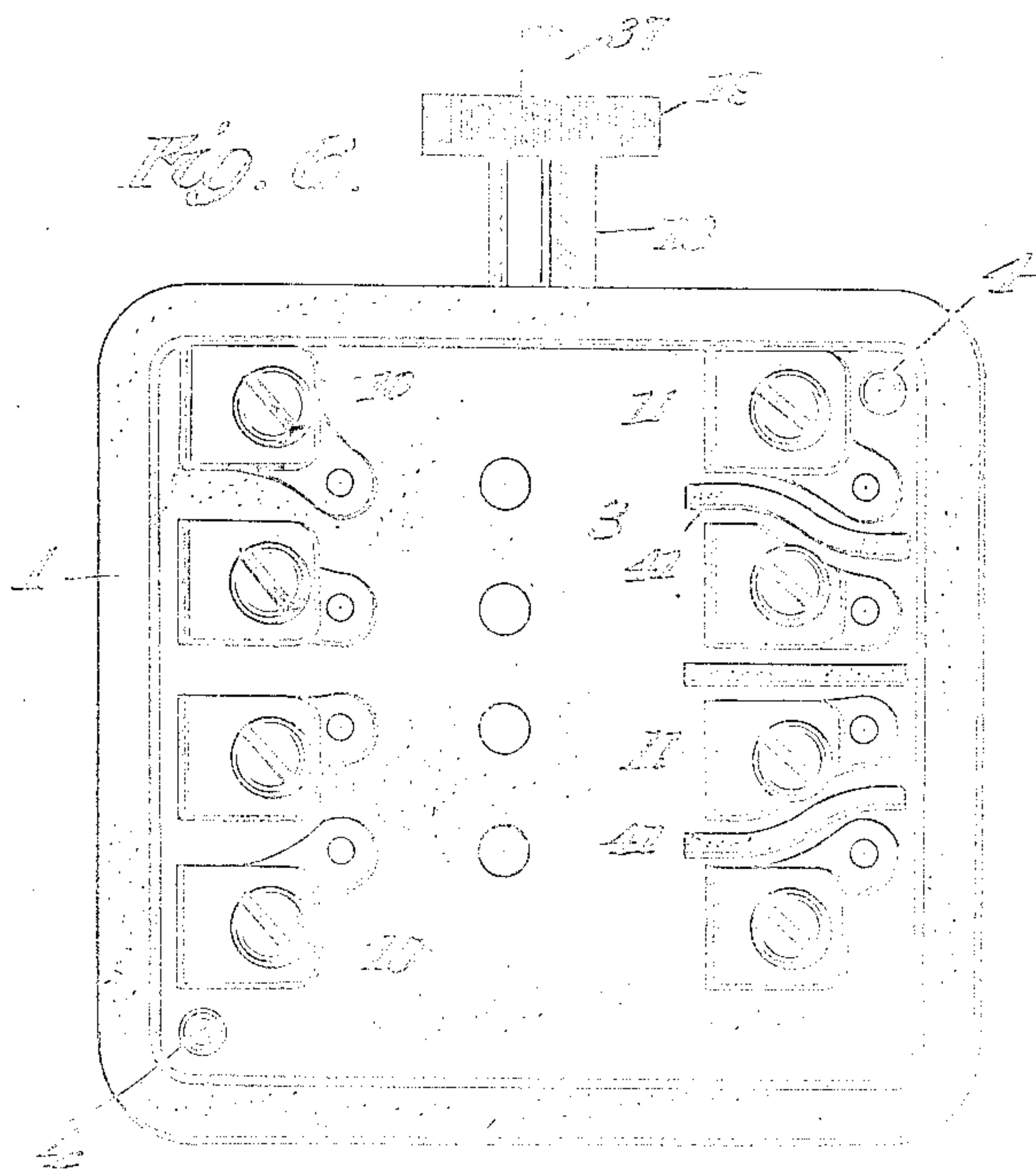
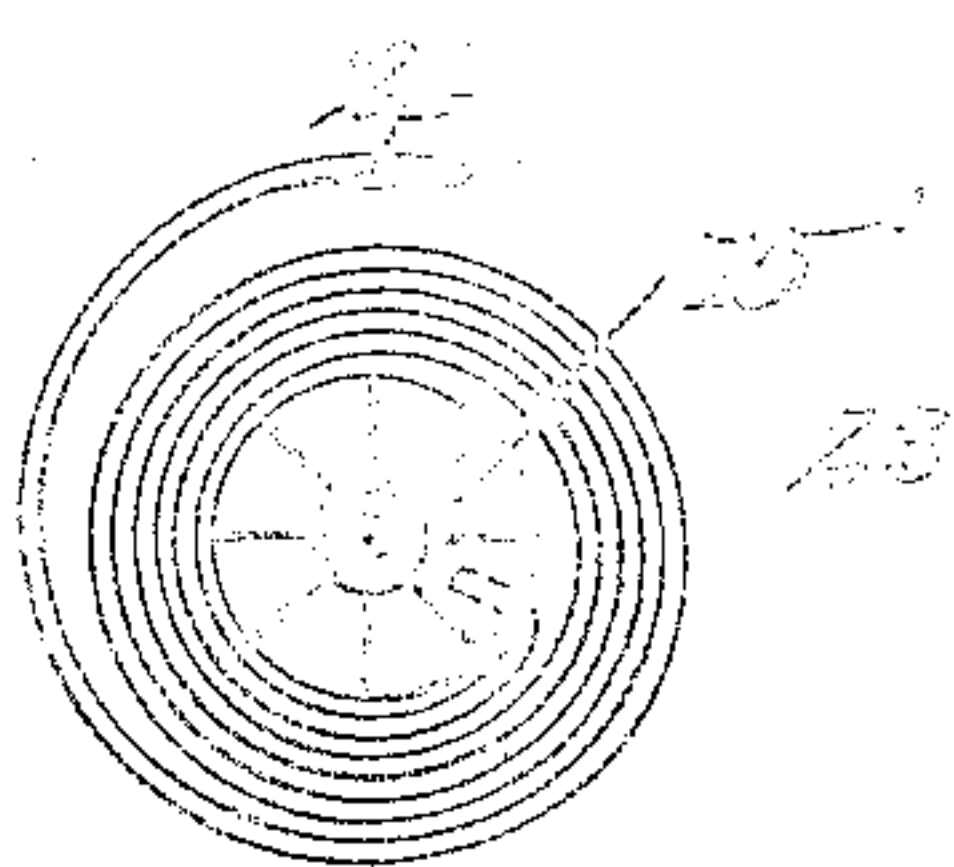


Fig. 7.



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MULTIPLE ELECTRIC SWITCH.

No. 843,902.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed August 9, 1906. Serial No. 329,841.

To all whom it may concern:

Be it known that I, HERMAN J. S. LEWIS, a citizen of the United States, residing at the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Multiple Electric Switch, of which the following is a full, clear, and exact description.

My invention relates to a multiple switch for incandescent lamps and other electrical appliances where it is desired to switch any desired number of circuits into and out of action.

The principal object of the invention is to provide a switch which is adapted by the rotary movement of a single part to move a number of switch-levers successively into circuit-closing relation. I further aim to release all of the switch-levers simultaneously when desired, and, finally, to have both the circuit-closing and circuit-opening movements take place very quickly for each switch-lever, so that the circuits are broken abruptly and dangerous or destructive arcs prevented.

With these and other objects in view the invention consists in the combination of parts and features of construction hereinafter set forth and claimed.

In the drawings, Figure 1 is a side view with part of the casing broken away, showing a multiple switch embodying the principles of my invention. Fig. 2 is a sectional view on line 2 2 of Fig. 1 looking in the direction of the arrow. Fig. 3 is a similar view showing the switch-levers in circuit-closing relation. Fig. 4 is a sectional view on the line 4 4 of Fig. 3 looking in the direction of the arrows. Fig. 5 is a view from the right-hand side in Fig. 1. Fig. 6 is a bottom plan view, and Fig. 7 is a detail view, showing the spiral spring which is utilized in the construction.

For the purposes of private dwellings it is ordinarily impracticable to have switch-boards and panel-boards to control the various circuits. The knife-blade switch is, however, best adapted for controlling circuits where there is considerable amperage, since it makes good sliding contact with low resistance, has a wide throw to separate the parts, and is capable of moving quickly. In order to retain all of the advantages of a knife-blade switch and at the same time provide the simplicity of operation which is

necessary in a dwelling, I inclose a number of specially-constructed knife-blade switches within an insulating-box and have a cam operated by an ordinary button for moving the various knife-blade switches exactly as if they were directly manipulated by a skilled electrician.

Referring now to the drawings, in which like parts are designated by the same reference-sign, 1 indicates the box of housing of porcelain or insulating material, which may be opened at one side 2 to receive the switch and mechanism.

3 indicates a base which is inset in the open side 2 of the box and which may be secured in place by bolts 4, passed through the box and base.

The knife-blade switches are designated at 5, all pivoted at a central point 6 to standards 7 on the base 3.

8 and 9 indicate contact-plates for both ends of the knife-blade switches. These plates are disposed in rows on the base 3, so as to lie in the path of the switch-levers 5.

10 and 11 indicate terminal clips respectively connected to the plates 8 and 9 and from which any desired circuit-connections may be made.

Journaled on an axis in proximity to the switch-levers 5 there is provided a cam 12 in the form of a block of insulating material with a cylindrical and cut-away portion adapted to move the various switch-levers. This cam or rotary block 12 is loose on a spindle 13, but is constrained against longitudinal movement by certain parts hereinafter described. The spindle and block 12 are, however, capable of being clutched together by a pin 15 on the spindle, which may enter notches 15' in a small collar 16, fixed to the block. The spindle is normally impelled into this clutching relation by a spring 17.

At the end of the spindle opposite the clutch 15 15' there is a sleeve 18 with a milled button 19 and which is splined to the spindle at 20. 21 indicates a ratchet-wheel on the sleeve 18 and which is constrained against reverse movement by a spring-pawl 22, pivoted to the housing 1. By this means the spindle may be impelled rotarily in one direction by turning the button 19; but the spindle is capable of a longitudinal movement independently of said button. It is evident that when the clutch 15 15' is engaged that

the cam or block 12 may be turned by the button 19. When, however, the spindle is moved inwardly to disengage the clutch 15 15' the cam or block is capable of moving freely in either direction. I provide a spring for normally impelling this block in reverse direction, so that the cam or block moves rearwardly with a spring-impelled movement whenever the clutch is released. 23 designates a spring for this purpose secured to the housing at 24. 25 denotes a stop co-operating with a plate 26, fixed to the block 12 to limit such rearward rotation.

The cam or block is formed differently at different zones or sections along its length corresponding to the various switch-levers 5. The form corresponding to the first switch-lever of the series is clearly shown in Figs. 2 and 3. In the practical construction a cylindrical surface 27 is interrupted by a notch 28, having one substantially radial wall 29, at the outside edge of which is a rounded protuberance 30. Each of the switch-levers 5 carries a pivoted finger 31, which is capable of certain limited movement. In the construction shown the movement is limited by a portion 32 of the finger which moves in contact with the surfaces 33 and 34 of the switch-lever. The relation is such that the point 35 of the finger is capable of moving into opposite tangential directions on the surface 27 of the cam or block 12. The second, third, and fourth switch-levers have pivoted fingers in all respects similar to the finger 31 of the first lever 5. The cam or block 12 also has zones or sections for the respective switch-levers, which are exactly like the first section, as shown in Figs. 2 and 3, except that the notch 28 is wider in the case of each successive switch-lever of the series. The walls of the notches for the second, third, and fourth switch-levers are designated by dotted lines in Figs. 2 and 3.

36 indicates springs connected to the various switch-levers and which normally impel them into circuit-closing relation and in a direction to bear the finger 31 against the cam or block 12.

The operation is as follows: I will imagine all of the switch-levers to be in circuit-opening relation, as shown in Fig. 2, and that it is desired to close the circuit of the fourth switch-lever. For this purpose the button 19 is turned in the direction permitted by the ratchet 21, which has the effect of turning the cam or block 12 in the direction of the arrow in Fig. 2. After a certain distance of movement the protuberance 30¹ comes into contact with the finger 35 of the fourth lever of the series. The first effect of this protuberance is to swing the pivoted finger 31 toward the right in Fig. 2, after which the pivoted finger drops into the notch 28⁴, corresponding to the fourth switch-lever. The

fourth circuit is now closed and the third, second, and first switch-levers are thereafter successively tripped into action. The relation of parts just after the last switch-lever has moved is shown in Fig. 3. It will be seen that the finger 31 is so directed that it acts as a detent and drops freely past the radial wall 29 of the notch. This is by reason of the fact that it has been previously moved into such relation by its engagement with the protuberance 30. All of the switch-levers are now in circuit-closing relation. The switch-levers are all moved into circuit-opening relation at the same time by depressing the spindle 13 inward. For this purpose the end of the spindle projects beyond the button 19, as shown at 37, where it may be provided with any suitable insulating-button of ornamental character. When the spindle is depressed inward, the clutch 15 15' is released and the spring 23 impels the spring or block 12 in the direction of the arrow in Fig. 3. The first effect of this rotation is to swing the pivoted finger 31 of the first switch-lever 5 back into the relation shown in Fig. 2. Thereafter the surface 38 of this finger acts as a cam-surface, so that the same is depressed by the rotation of the block 12 and the switch-lever is pressed into circuit-opening relation. By the time the block 12 is returned to its initial position all of the switch-levers will have been so impelled to open their respective circuits. It will be observed that since the return motion of the block 12 is a spring-impelled movement the opening of the circuits at all of the switch-levers will be very rapid. Thus I secure the separate manipulation of all the switch-levers and an abrupt movement in their circuit-closing and circuit-opening action all by the manipulation of a single button and a release-spindle. An additional feature of the arrangement is that it is impossible to manipulate the button 19 so as not to get an abrupt movement for closing the circuits and an abrupt movement for opening them.

In practice the various contact-plates 8 are separated by insulating-partitions 40, which are conveniently made of porcelain integrally with the base 3. The terminals 10 are also separated by insulating-partitions 41. As many of these insulating-partitions may be provided as required; but it is ordinarily sufficient for all practical requirements to provide merely the ones above mentioned.

Having described my invention, I claim—

1. In a multiple electric switch, a plurality of pivoted switch-levers, springs for impelling said levers normally into circuit-closing relation, and a cam having a reverse movement for actuating the switches into circuit-opening and circuit-closing relation respectively.

2. In a multiple electric switch, a plurality

of pivoted switch-levers, springs for impelling said levers normally into circuit-closing relation, and a cam having a reverse movement for actuating the switches simultaneously into circuit-opening and successively into circuit-closing relation.

3. In a multiple electric switch, a rotarily-mounted insulating - cam, a plurality of switch-levers in the path of said cam and adapted to be tripped into circuit-closing relation thereby, and means for impelling said cam to have an abrupt rotary movement whereby said levers are moved into circuit-opening relation.

4. In a multiple electric switch, a plurality of knife-blade switch-levers adapted to close a plurality of independent circuits, a button for moving said levers into circuit-closing relation by an abrupt movement and another depressible button for moving them into circuit-opening relation by an abrupt movement.

5. In a multiple electric switch, a switch-lever having a pivoted finger thereon and a cam arranged to act upon said finger, whereby the same acts as a detent to release the switch-lever, and has a cam-surface to reposition said lever by reverse movement of said cam.

6. In a multiple electric switch, a spring-impelled switch-lever, a finger on said switch-lever, a cam in the path of said finger and arranged to move the same in a direction to trip the switch-lever into action and reposition said lever by reverse movement of said cam.

7. In a multiple electric switch, a plurality of switch-levers each having a pivoted finger thereon, a cam moving in the path of said fingers to successively trip the switch-levers into circuit-closing relation, and means for abruptly rotating the said cam in the reverse direction whereby said levers are repositioned in circuit-opening relation.

8. In a multiple electric switch, a plurality of switch-levers, a cam spring-impelled in one direction and acting on said switch-levers to move them into circuit-opening relation by such rotation, and means for rotating said cam in the other direction when desired, whereby the switch-levers are successively tripped into circuit-closing relation.

9. In a multiple electric switch, a plurality of switch-levers, a button for moving said switch-levers successively into circuit-closing relation by continued rotation of said but-

ton, and separate depressible means for simultaneously moving the switch-levers into circuit-opening relation.

10. In a multiple electric switch, a plurality of switch-levers spring-impelled into circuit-closing relation, a button arranged to trip said levers successively into circuit-closing relation by continued rotation of said button and separate depressible means for impelling all of the switch-levers abruptly into circuit-opening relation.

11. In a multiple electric switch, a plurality of switch-levers spring-impelled into circuit-closing relation, means for tripping the levers successively into such relation, and a separate spring connected to impel the switch-levers into circuit-opening relation when released.

12. In a multiple electric switch, a plurality of switch-levers spring-impelled into circuit-closing relation, a button arranged to trip said levers successively into such relation, a spring for impelling said levers into circuit-opening relation, and a spindle coaxial with said button and adapted to release said last-mentioned spring whereby the levers are simultaneously moved into circuit-opening relation.

13. In a multiple electric switch, a spindle capable of movement in one direction, a cam on said spindle, and spring-impelled in the other direction, a clutch for connecting said spindle and cam, switch-levers in the path of said cam, and means for releasing said clutch.

14. In a multiple electric switch, a plurality of switch-levers, springs for impelling the levers into circuit-closing relation, means for tripping the levers into such relation, and means for impelling the switch-levers into circuit-opening relation by an abrupt movement against the tension of said springs.

15. In a multiple electric switch, a spindle capable of longitudinal movement, a sleeve splined thereon and capable of rotary movement in one direction, a cam on said spindle, and spring-impelled in one direction, a clutch connecting said spindle and cam and pivoted switch-levers in the path of said cam.

In witness whereof I subscribe my signature in the presence of two witnesses.

HERMAN J. S. LEWIS.

Witnesses:

WALDO M. CHAPIN,
WM. M. STOCKBRIDGE.