

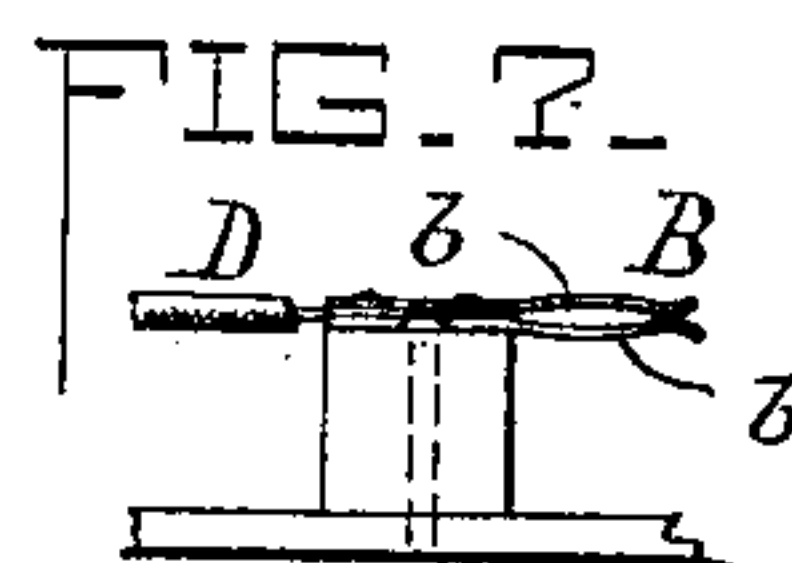
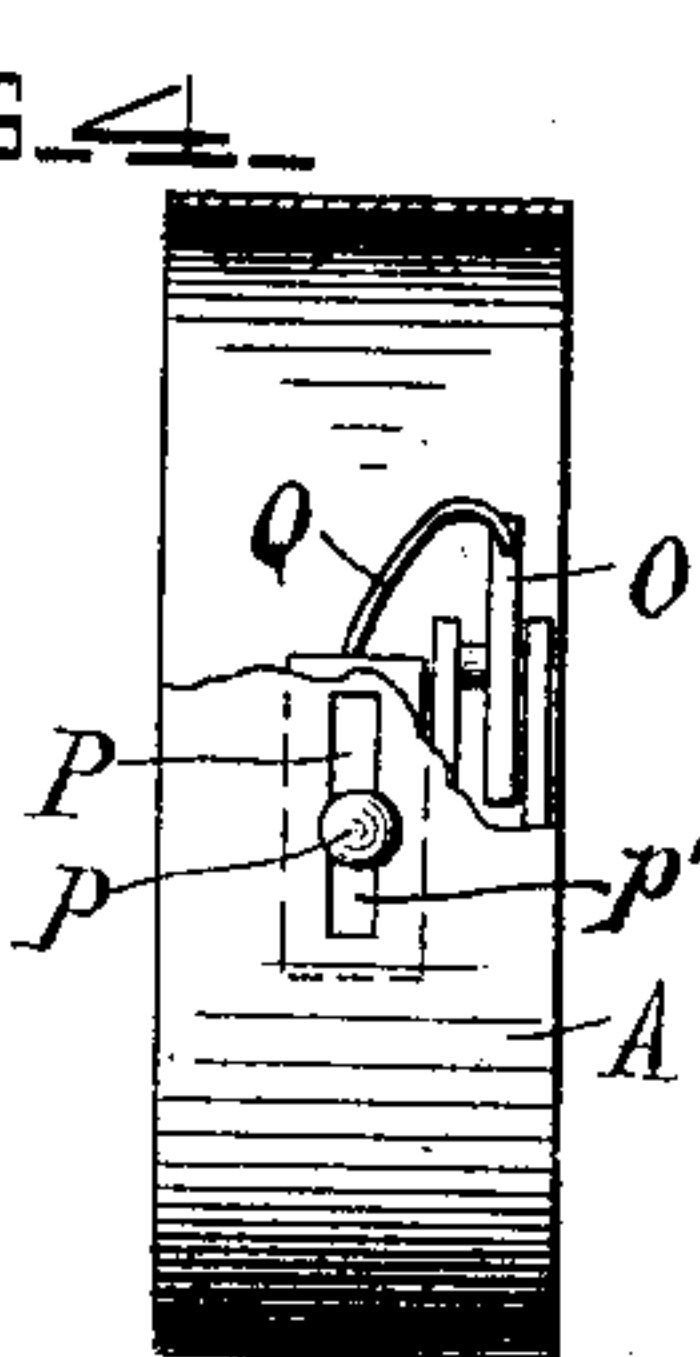
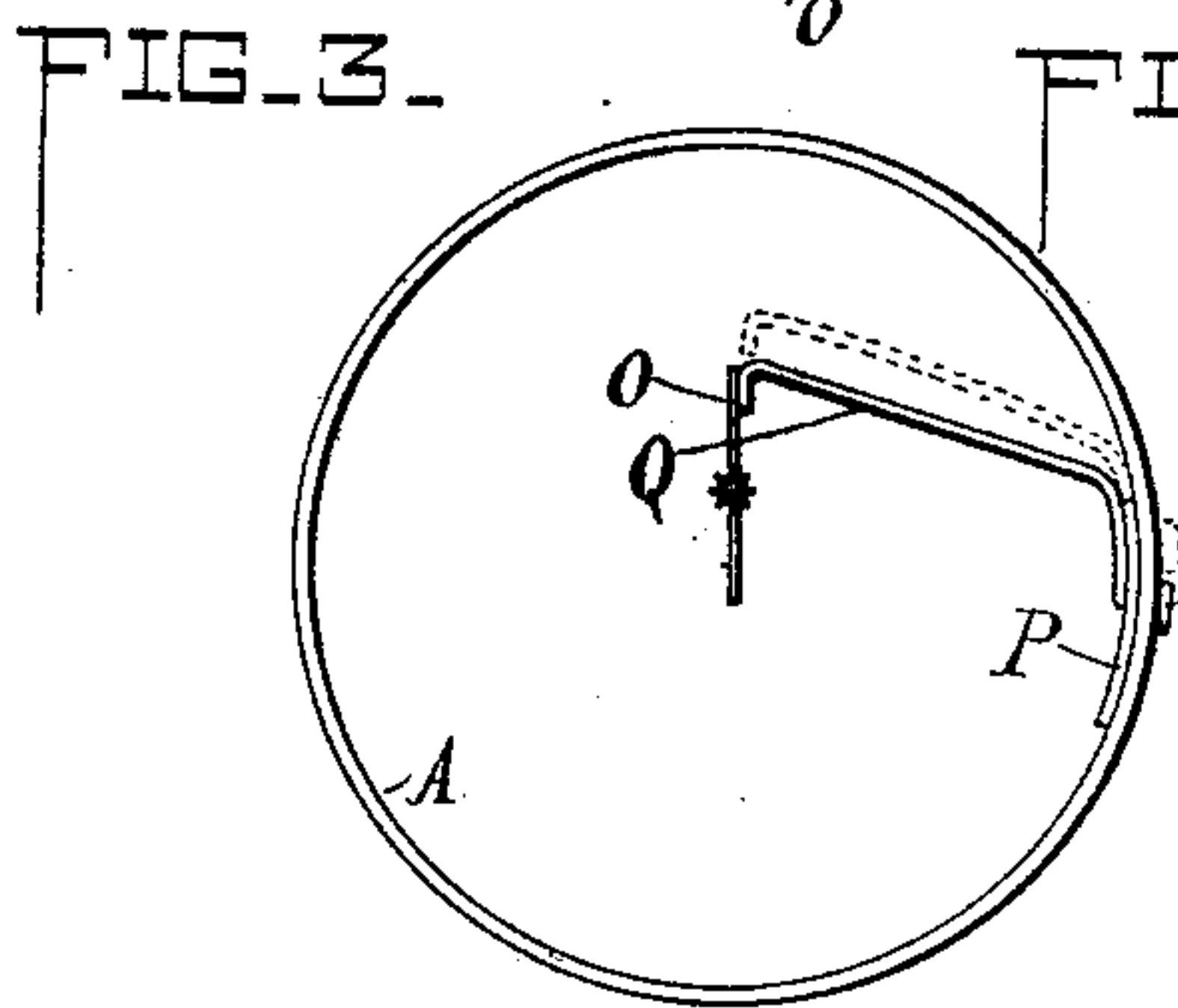
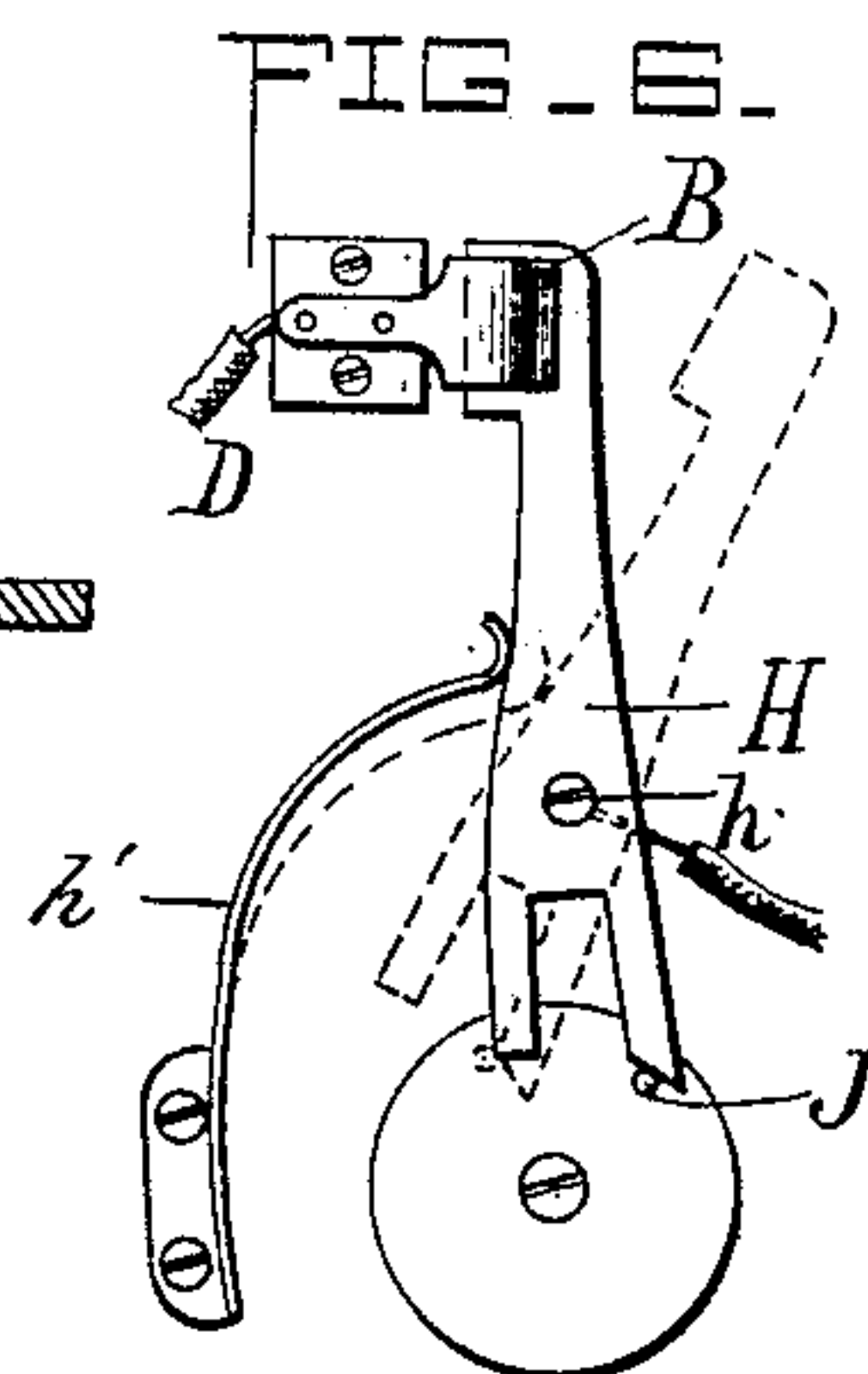
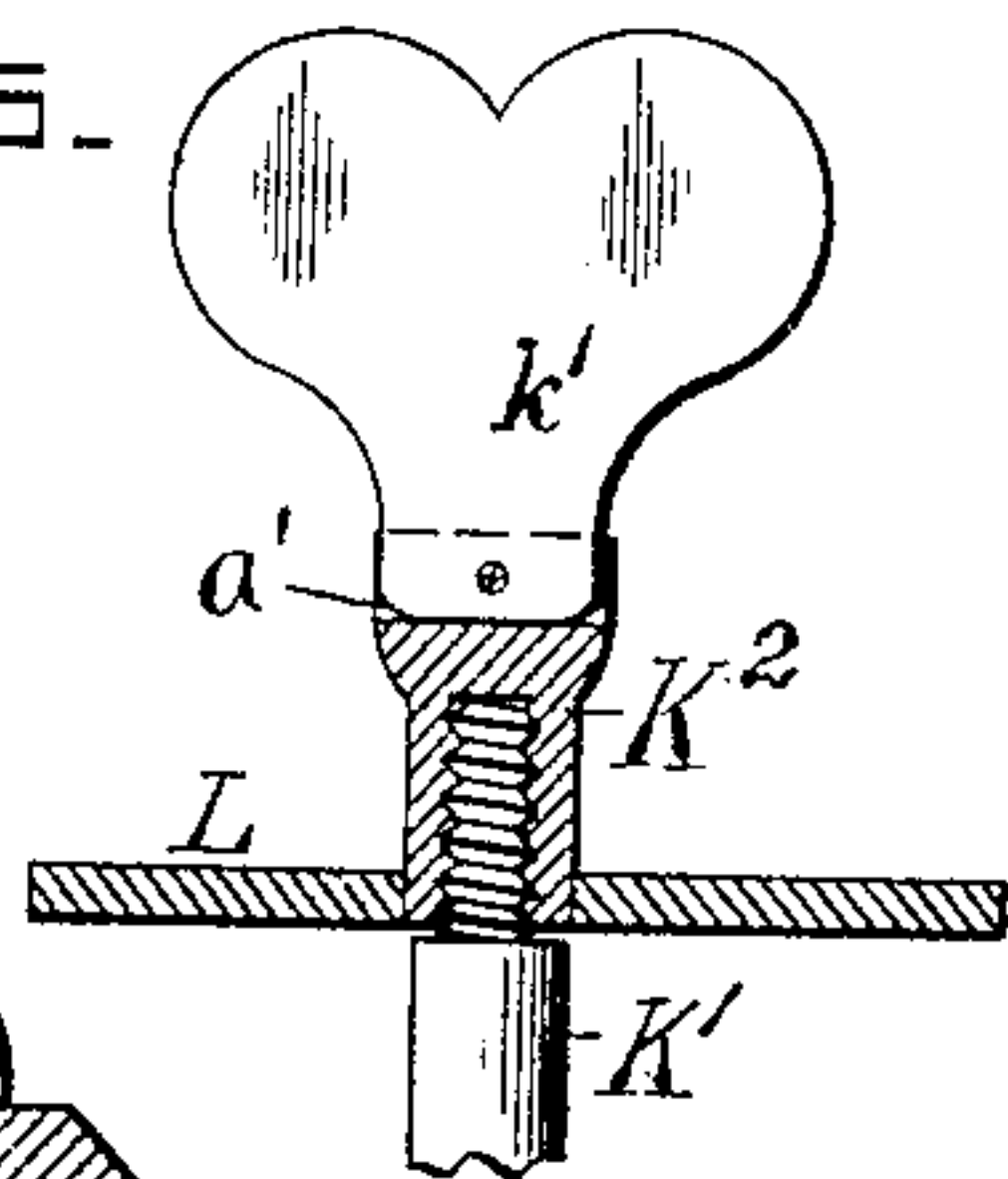
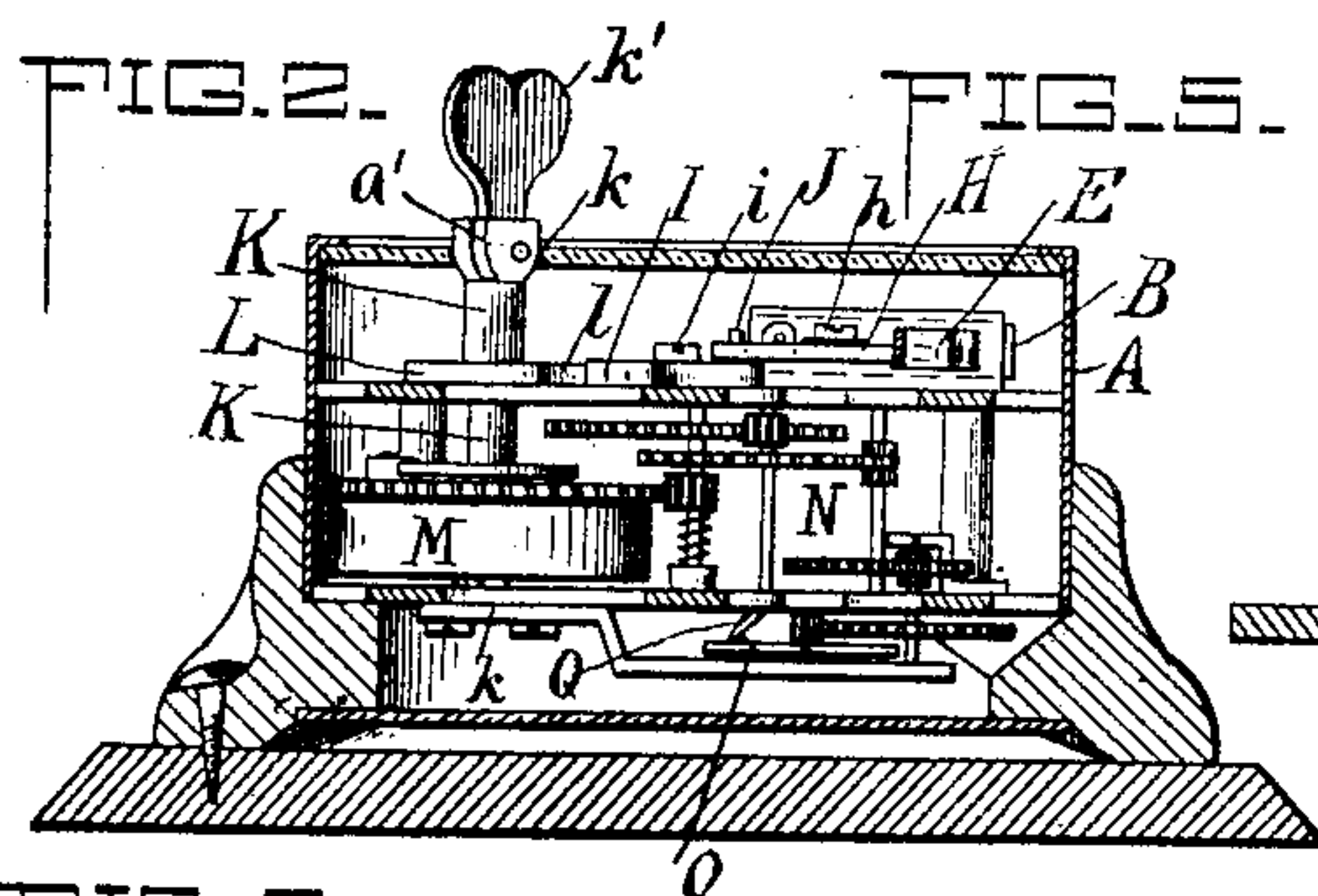
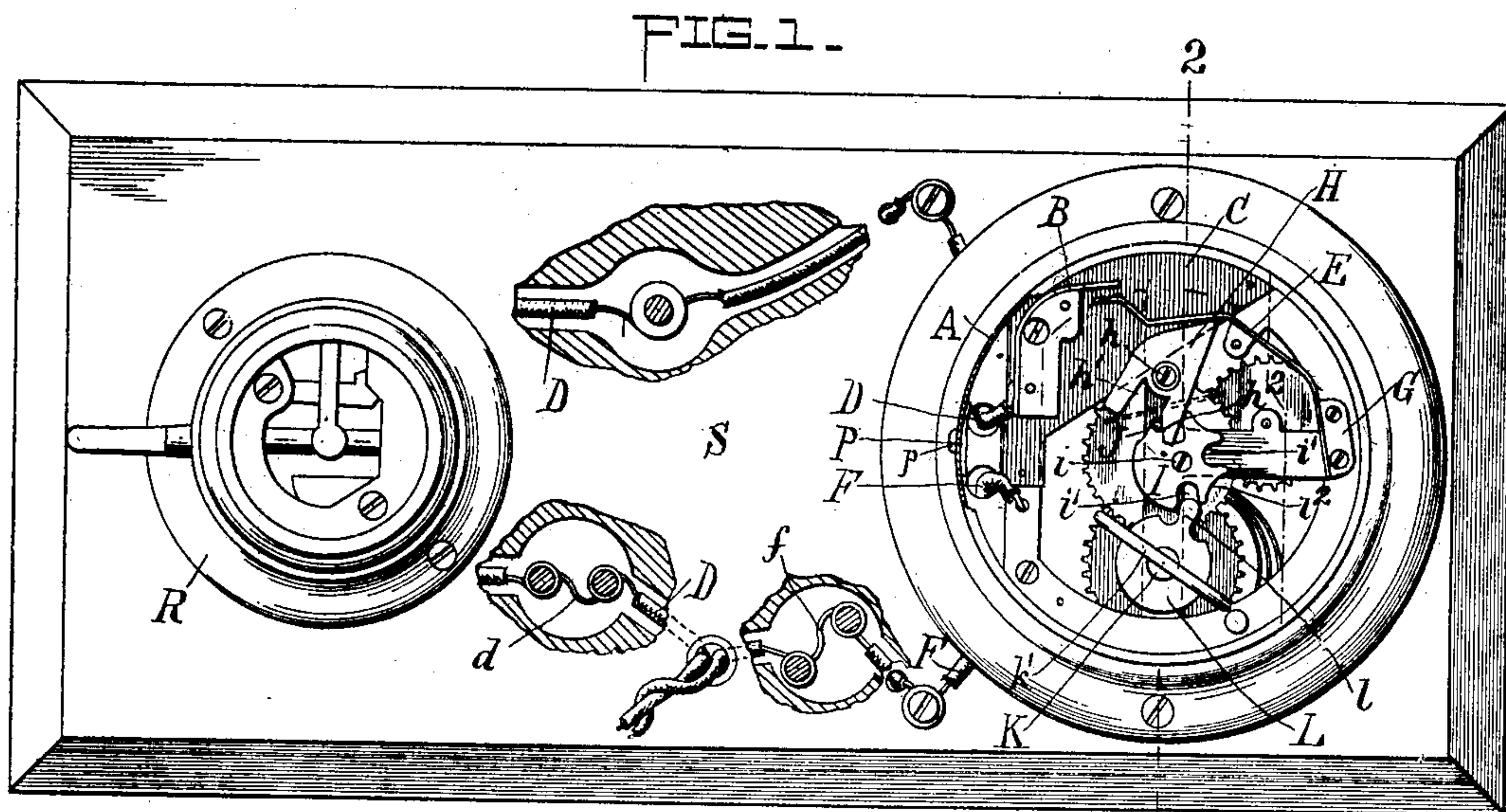
No. 659,766.

Patented Oct. 16, 1900.

J. H. ROBERTSON.
AUTOMATIC ELECTRIC CUT-OUT.

(Application filed June 22, 1899.)

(No Model.)



WITNESSES

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AUTOMATIC ELECTRIC CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 659,766, dated October 16, 1900.

Application filed June 22, 1899. Serial No. 721,434. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. ROBERTSON, a citizen of the United States, residing at Morrison, in the county of Whiteside and State of Illinois, have invented certain new and useful Improvements in Automatic Electrical Cut-Outs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a cut-out or switch for automatically opening or closing an electric circuit when a predetermined amount of time has elapsed after the same has been respectively closed or opened.

The invention is particularly adapted for and in this specification and drawings is shown and described as a cut-out for electric lamps or lights.

In the use of electric lamps that are ordinarily used but occasionally and but for a few moments at a time—such, for instance, as are used in closets, cellars, store-rooms, bath-rooms, &c.—it frequently happens that the lamps are turned on and thoughtlessly left burning when not required, thus causing useless and unnecessary expense.

Among other objects it is the object of my invention to prevent this unnecessary burning of the lamps by providing means set into operation upon the closing of the circuit for lighting the lamp or when the lamp is lighted, which means shall automatically when a predetermined amount of time has elapsed open the lamp-circuit, thus extinguishing the light.

It is a further object of the invention to provide such means capable of retaining the lamp lighted for different lengths of time.

A further object of the invention is to so construct the device that it can be used manually to make and break the circuit, so that the lamp will not necessarily have to remain lighted the length of time at first intended and for which the automatic cut-out was set.

A further object of the invention is to so construct and arrange the several parts of the mechanism that by turning an ordinary turn-button the lamp can be lighted and the automatic cut-out set into operation to extinguish the light.

A further object is to provide a simple and inexpensive mechanism for accomplishing the purposes above mentioned.

A further object is to so construct the device that the automatic mechanism may readily be made inoperative and the switch used to open and close the circuit manually like an ordinary switch.

With such and other objects in view the invention is embodied in an electrical switch or cut-out, a device for operating the same to close the circuit, and mechanism or a motor set into operation by the actuation of the closing device for automatically operating said switch or cut-out to open or break the circuit.

The invention is further embodied in the novel parts, combination, and arrangements of the parts hereinafter described, and particularly set forth in the claims.

In order that my invention may be properly understood, I have shown in the accompanying drawings means for carrying the same into effect; but I desire it particularly understood that I do not limit my invention in its useful application to the particular construction which for the sake of illustration I have therein delineated.

In said drawings, Figure 1 is a plan view showing my improvements and showing the same adapted for a cut-out for an electric lamp. Fig. 2 is a sectional view on the line 2 2 of Fig. 1. Fig. 3 is a view, partly in section, showing means for changing the cut-out from an automatic to a manually-operated switch. Fig. 4 is an elevation, partly broken away, of the parts shown in Fig. 3. Fig. 5 is a detail view of a portion of the operating-shaft and of the turn-button. Fig. 6 is a detail plan view of a modified form of circuit-maker, and Fig. 7 is an elevation showing the fixed contact.

Referring to the drawings, wherein like reference characters refer to similar parts throughout the several views, A designates a suitable inclosing case or box in which the several parts of the automatic cut-out are located and protected. Within said box or case is located a contact B, mounted on an insulating-block C, which effectually insulates said contact from the metallic parts of the apparatus hereinafter described. This contact B is in electrical connection with one of

the wires D of an electrical circuit—as shown, a lamp-circuit.

E represents a contact-finger conveniently, as shown in the drawings, in the form of a long leaf-spring and located in a position adapting it to be moved into and out of contact with the contact B. The contact-finger E is in electrical connection with the other wire F of said electrical circuit. The wire F can be secured directly to the spring-finger; but, as shown in the drawings, the finger E is mounted on a plate G, constituting a part of the frame for supporting the several parts of the cut-out mechanism, and the wire F is shown as being secured to this plate G in any preferred or usual manner.

H indicates a lever or arm pivoted on a stud or pivot h secured to the frame and having one end of said arm adjacent the contact-finger E and adapted when operated or turned on its pivot to force the contact-finger into engagement with the contact B and close the circuit. The contact-finger normally is out of engagement with the contact B. The arm H has in its rear side a slot h' , one side of which, h^2 , is inclined, as shown.

Mounted on the frame and rotatable on a stud or pivot i is a star-wheel I, provided with radial slots i' and concaved peripheral faces i^2 . On the star-wheel I is a finger or pin J, adapted when the wheel is turned to enter the slot h' in the arm H, engage the face h^2 , and by continued movement of the wheel I to oscillate said arm H on its pivot and force the contact-finger E into engagement with the contact B. When the wheel I is turned in the opposite direction, the finger J will engage the opposite side of the slot in the arm H, moving the same in the opposite direction and permitting the contact-finger E to move away from the contact B.

Beside the wheel I is mounted on a shaft K a disk or circular plate L, carrying a finger or projection l , adapted to enter the radial slots i' in the star-wheel I and by the rotation of the disk L to turn said wheel I for the purpose before stated. The shaft K is mounted in suitable bearings k in the frame and is provided with an operating-handle or turn-button k' without the casing A, which, as shown, is removably secured in a slot a' in the end of the shaft. The shaft K is made in two sections K' and K^2 , screwed together, and the disk L is made flat and thinner than the wheel I, for a reason to be hereinafter stated. From the foregoing it is evident that by turning the shaft K in one direction—to the left—the wheel I will be turned and the arm H oscillated to make the contact. For automatically turning the shaft K in an opposite direction to break the circuit I make use of mechanism conveniently in the form of a spring-motor, comprising a spring M, arranged to be wound up by the turning of the shaft K, a suitable train of gears, (indicated generally at N,) and a fly O. I do not deem it necessary to describe more completely the

spring-motor, as any suitable motor can be employed which is adapted when set by the turning of the shaft K to operate to slowly turn the shaft in a reverse direction to operate the cut-out.

Slidably mounted on the case or box A is a plate P, to which is secured a button p , projecting through an elongated slot p' in the case. Secured to the plate P is a finger Q, adapted in one position of the plate (that indicated in full lines in the drawings) to engage and prevent the rotation of the fly-regulator O and in the other position (indicated in dotted lines) to permit the free rotation of the mechanism.

R indicates an electric-lamp socket of any usual or preferred construction, which, as shown, is in the circuit D F. It is desirable, and I have shown the wires D and F provided with suitable fuse-wires (represented at d and f) for the purpose of preventing injury to the apparatus in a well-known manner.

For the sake of convenience in illustration the lamp and cut-out are shown in the drawings as mounted on a suitable supporting-base S; but it is to be understood that in usual practice the lamp is not so located, but is possibly at a distance from the cut-out mechanism, as is often the case where an electric lamp is arranged at a distance or in another room from its switch-button.

The operation of the invention is substantially as follows: To close the circuit, the shaft K is turned to the left, which operates the disk L, wheel I, and arm H and partially winds the spring of the motor, when upon releasing the shaft the spring will cause the operation of the motor, the turning of the shaft K in the opposite direction, and a corresponding reverse movement of the wheel I. When the finger J on the wheel engages the side of the slot h' , the arm H will be moved likewise in a reverse direction. The motor and several parts of the apparatus are so proportioned that the return movement of the arm H will be regulated according to the amount of rotation given to the shaft K—that is to say, if the shaft is turned a part of a revolution—say one-half turn—it will require so many minutes—say five minutes—for the motor to return the shaft sufficiently far to cause the pin J on the wheel I to engage and return the arm H. If it is desired to retain the light twice as long, the shaft K is turned twice as far, when it will require double the time for the parts to return to the position to break the contact. Thus the operator determines by the amount of rotation given the shaft K the length of time the lamp will remain lighted. If it is desired to break the circuit and extinguish the light in a shorter time than that for which the motor was set, the operator turns the button k' in the reverse direction after the lamp has been lighted, which will cause the shaft-section K^2 to turn on its screw connection with the part K' and reversely operate the disk L and wheel I, thus

immediately breaking the circuit. On account of the screw connection between the parts K' and K^2 of the shaft K the part K' is permitted to gradually be returned by the motor after the part K^2 has been turned, as stated. The disk L being of less thickness than the wheel I , it will be seen that the turning of the section K^2 on the screw will not cause the disengagement of the disk L and wheel I . If the operator desires to render inoperative the automatic cut-out, this can be done by moving the plate P to throw the finger Q into engagement with the fly O , which will prevent the operation of the motor and permit the manual operation of the cut-out, as above indicated.

In Figs. 6 and 7 is illustrated a modification of the switching device, the lever or arm H in this instance constituting one of the switch members and obviating the necessity of the long spring E . The lever H is electrically connected to one of the circuit-wires in a suitable manner, as by connecting the wire to the pivot-pin h . The other member of the switch B is shown to be in the form of a spring-clip, having the opposing contact-plates b , between which the lever H is moved, as in the ordinary knife-switch, and which by their pressure hold the lever. h' indicates a spring bearing against the lever H and tending to move the same away from the stationary contact after it has been moved sufficiently far to overcome the grip of the plates b .

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

1. The combination of an electrical switch, a pivoted arm for making and breaking the circuit, and having a slot therein, mechanism for operating said arm comprising a part having a finger working in said slot, a rotatable device for operating said part, and a motor set into operation by the turning of said rotatable device for turning the same in the reverse direction, substantially as and for the purpose described.

2. The combination of an electrical switch, a turn-button and connections adapted upon turning in one direction to close said switch, a motor adapted to turn said turn-button and connections in the opposite direction to open said switch, and means adapted to open said switch independently of said motor, substantially as described.

3. The combination of a pivoted electrical switch, an arm for making and breaking the circuit, a wheel for operating said arm, a disk for turning said wheel, means for turning said disk in one direction, and a motor set into operation by the turning of said disk for turning said disk in a reverse direction, substantially as and for the purpose set forth.

4. The combination of a contact, a spring-

actuated contact-finger, a turn-button and connections for moving said finger in one direction to make contact with said contact, and a motor set into operation by the turning of said turn-button for permitting the return movement of said contact-finger, the switch being adapted to remain closed for different periods of time dependent upon the amount of movement given said device, substantially as described.

5. The combination of a contact, a spring-actuated contact-finger, an arm for moving said finger in one direction, a wheel for moving said arm, a disk for turning said wheel, means for turning said disk in one direction, and a motor set into operation by the turning of said disk for turning said disk in a reverse direction, substantially as described.

6. The combination of a contact, a spring-actuated contact-finger, a pivoted arm engaging said finger, a star-wheel having a finger engaging in the slot in said arm, a disk having a projection adapted to engage in slots of said star-wheel, means for turning said disk in one direction, and a motor for turning said disk in the opposite direction, substantially as described.

7. The combination of a contact, a spring-actuated contact-finger, a pivoted arm engaging said contact-finger, and having a slot therein, a star-wheel having a finger engaging in said slot for actuating said arm, and having peripheral concaved faces, a disk located adjacent said wheel and having a projection adapted to engage in the slots of said star-wheel, means for turning said disk in one direction, and a motor for turning said disk in the opposite direction, substantially as described.

8. The combination of an electrical switch, a device and connections for moving one member of said switch in one direction, a motor set in operation by the actuation of said device for moving said switch member in the opposite direction, said device being free to be turned in the opposite direction independently of said motor, substantially as described.

9. The combination of an electrical switch, a two-part shaft, means adapted upon turning said shaft in one direction to close said switch, a motor adapted to turn said shaft in the opposite direction to open said switch, one part of said shaft being adapted to be turned to open said switch independently of said motor, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. ROBERTSON.

Witnesses:

HARVEY S. GREEN,
NATE LOGUE.