

No. 668,905.

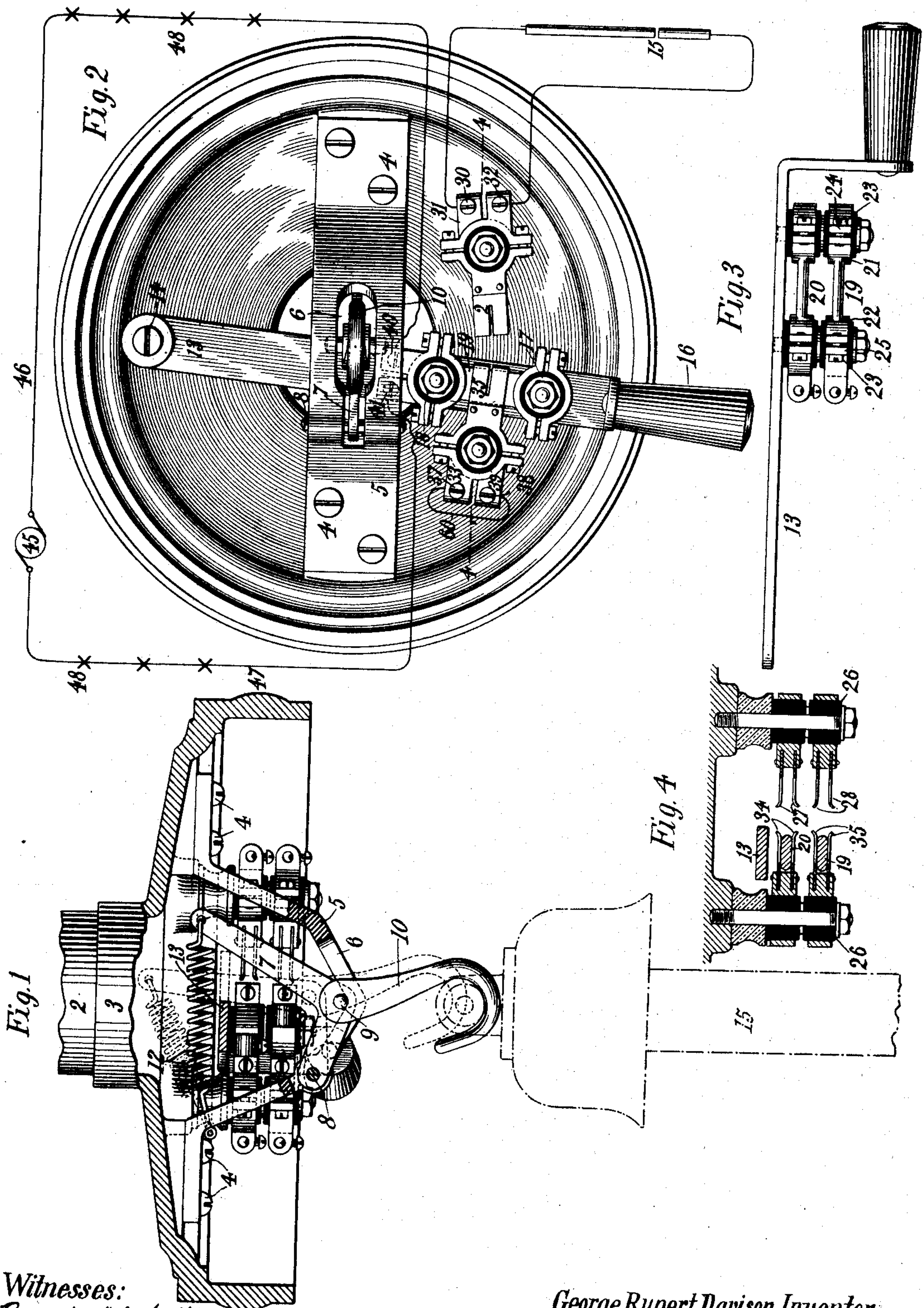
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AUTOMATIC CIRCUIT CLOSER FOR ARC LAMP CIRCUITS.

(No Model.)

(Application filed July 24, 1900.)



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AUTOMATIC CIRCUIT-CLOSER FOR ARC-LAMP CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 668,905, dated February 26, 1901.

Application filed July 24, 1900. Serial No. 24,632. (No model.)

To all whom it may concern:

Be it known that I, GEORGE RUPERT DAVISON, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Automatic Circuit-Closers for Arc-Lamp Circuits, of which the following is a specification.

My invention relates to automatic cut-outs for arc-lamps; and it is embodied in an apparatus designed to support a lamp and itself to be held in place by any ordinary support, the distinguishing feature of my apparatus being that the movable part of a switch device adapted to switch the lamp into or out of circuit is so connected and arranged as to be freely operated when the lamp is in position, whereas on the removal of the lamp for the purpose of repair or for any other reason the said movable part is automatically moved in such a direction as to complete the main lighting-circuit through a cut-out and hold it completed until the lamp is restored to place.

It sometimes happens that operators forget to actuate the usual lamp cut-out when they remove one or more lamps from the circuit, and as a consequence it is impossible to operate the system until the particular point is found at which the circuit is open and the cut-out switch at that point is operated. My invention is designed to provide against such an occurrence. While, however, I do provide means for the automatic closure of the lighting-circuit on the removal of a lamp, yet I in no way interfere with the free operation of the switch-arm for cutting the lamp into or out of circuit while it is in position.

My invention in the form in which I have embodied it includes other details, which will be fully explained in the present specification and more particularly pointed out in the claims.

In the drawings accompanying this specification and forming a part thereof, Figure 1 is a vertical section through the supporting device, which contains the structural elements of my invention, showing in dotted lines the top of an arc-lamp which is designed to be supported by the said device. Fig. 2 is a bottom view of the supporting structure, showing also a diagram of the electric cir-

cuits. Fig. 3 is a side view of the switch-arm detached, and Fig. 4 is a section along the line 4 4 in Fig. 2.

Referring to the drawings, 1 is a suitable head or support adapted to be connected at the top to a primary supporting device, (shown at 2.) The part 2 is shown in the present instance as being broken off and constituting the lower end, say, of a pipe. The connection between the part 2 and the head or support 1 may be made by making the lower end of the said part 2 screw-threaded and adapted to be connected to an internally-screw-threaded boss or hub 3 on the part 1.

Inside the head or support 1 I secure by screws 4 4 or otherwise a U-shaped piece or yoke 5, having a central slot 6, within which is pivoted by a pivot-pin 8 a bent lever 7. Through the lever 7, near the bend, passes a pivot-pin 9, which serves to pivot a hook 10 to the lever 7. The upper end of the hook 10 is made in yoke form, and the two arms of the yoke stand on opposite sides of the lever 7, while the pin 9 extends through both the yoke-arms and the lever to serve as a pivot for the hook. It should be understood that the hook 10 is loosely pivoted, so that it will swing freely on the pivot 9 and will drop by gravity to the lowermost position which it is adapted to occupy whenever the head 1 is tilted in the direction in which the hook 10 is free to move. This freedom of movement of the hook 10 is only limited in a backward direction by the right-hand wall of the slot 6, as appears in Fig. 1.

To the upper end of the lever 7 is connected a spiral spring 12, the opposite end of the said spring being joined to the yoke 5 by any suitable means. When there is no lamp attached to the hook 10, the spring 12 occupies the position indicated in dotted lines in Fig. 1, and in that position the lever 7 presses against a contact bearing-arm 13, which, as shown in Fig. 2, is pivoted at 14 to the under side of the head or support 1. When, however, a lamp 15 is attached to the hook 10, as shown in Fig. 1, the spring 12 is distended and occupies the position shown in full lines in that figure. Under these conditions the contact bearing-arm 13 may or may not be in contact with the lever 7, the said contact

bearing-arm or switch-arm being then under the full control of an operator through the medium of its handle 16, which extends beyond the outer wall of the head or support 1. I have shown the lever out of contact with the switch-arm. Its reverse position is indicated, however, in dotted lines; but for the sake of clearness I have omitted to show in the dotted position the contacts which the lever carries.

On the switch-arm 13 I mount insulating-spools 17 and 18, preferably of porcelain, and I connect across from spool to spool two conducting switch-blades 19 and 20, usually of copper. The mode of connection for these switch-blades may be seen by examining Fig. 3, wherein the switch-blade 19 is shown as being formed in one piece with two semicircular hubs 21 and 22, which hubs are provided with flanges and are adapted to be secured by screws 23 23 to similar semicircular hubs 24 and 25. The spools 17 and 18 are surrounded by the described hubs and serve to insulate the switch-blade 19 from the similarly-formed and similarly-supported switch-blade 20, located above the blade 19.

On each side of the switch-arm 13 I mount and secure to the under side of the head or support 1 an insulating-spool 26, each spool carrying contact springs which are adapted to cooperate with the switch-blades 19 and 20. This structure is more particularly shown in Fig. 4, where a pair of springs 34 34 appears at the left-hand side as being in contact with the switch-blade 20, while a pair of springs 35 35 similarly appears as being in contact with the switch-blade 19. By referring to Fig. 2 it will be seen that the switch contact-springs are connected to the insulating posts or spools 26 by means which are entirely similar to the means whereby the switch-blades are joined to the posts 17 and 18. On the opposite side of the switch-arm 13 are two pairs of contact-springs, (marked, respectively, 27 27 and 28 28,) which are adapted to make contact with the switch-blades 20 and 19 whenever the switch-arm 13 is moved to its right-hand position. These contact-springs are mounted in the same way as has already been described in connection with the opposite springs, being attached to one of the posts or spools 26. They are provided with binding-screws 30 and 32, the former screw being in electrical connection with the spring pair 27 27 and the latter in electrical connection with the spring pair 28 28.

At 37 I show a binding-screw attached to an extension 33, which is in electrical connection with the contact-springs 35 35, while at 38 I show a binding-screw on an extension 39, which is in electrical connection with the contact-springs 34 34. The binding-screws 37 and 38 are permanently joined by a short-circuiting wire 60, so as to form a cut-out or main-line circuit-closer when the switch-blades are turned to that side.

It should be stated that a binding-screw 40 is in electrical connection with the blade 19,

as shown in Fig. 2, and that a binding-screw 41 is in electrical connection with the switch-blade 20.

At 45 I show a suitable generator of electricity from which mains 46 and 47 lead through a series of arc-lamps 48 48. The main circuit enters the special apparatus forming the subject of this invention at the binding-screw 40, and the return-circuit leaves the same at the binding-screw 41. The terminals of the circuit for the lamp 15 are respectively the binding-screws 30 and 32.

Assuming that the lamp 15 is attached to the hook 10 and that the spring 12 is distended by reason of the effect of the weight of the lamp upon the lever 7, connected with the said spring, the switch-arm 13 may then be operated in either direction at will without meeting other than frictional resistance. In Fig. 1 the switch-arm is represented as thrown over to the left, bringing the switch-blades 20 and 19 into cooperation with the spring pairs 34 34 and 35 35, respectively. Inasmuch as these spring pairs are connected by the wire 60 the lamp 15 is cut out of the circuit. At the same time it is true that the lamp 15 might readily be cut into the circuit, should an operator so wish, by simply moving the handle 16 to the right and bringing the switch-blades 19 and 20 into cooperation with the spring pairs 28 28 and 27 27, respectively. In other words, as has already been explained, the lamp 15 is under the complete control of an operator whenever the lamp is in position on the hook 10. If, however, the lamp 15 should be already in the circuit (the position of the switch-arm being reversed) and should it then be taken off the hook 10, the spring 12 would immediately pull the lever 7 over into the position into which the switch-blades 20 and 19 would cooperate with the spring pairs 34 34 and 35 35 and out of contact with the spring pairs 27 27 and 28 28, whereby the local lamp-circuit would be broken and the main lighting-circuit would be closed through the cut-out wire 60.

Owing to the fact that the hook 10 is loosely mounted, as has been described, upon the pivot-pin 9 this hook may be moved into a convenient position for attaching the lamp 15 without tilting the lamp so much as might be necessary if the hook remained vertically rigid. Thus there is less danger of injury to the lamp in the operation of securing it in position.

The invention claimed is—

1. In an arc-lighting system, the combination with a switch-arm, cooperating in one of its positions with a local lamp-circuit, and in another position with a cut-out for the lamp, of a lock adapted to hold the switch-arm in the second-described position, and a lamp acting by its weight to release the said lock.

2. In an arc-lighting system, the combination with a switch-arm, cooperating in one of its positions with a local lamp-circuit, and in another position with the terminals of a cut-

out for the lamp, of a spring adapted to lock the switch-arm in the second-described position, and a lamp operating by its weight to overcome the said spring.

5 3. In an arc-lighting system, the combination with a reversing switch-arm, cooperating in one of its positions with the terminals of a local lamp-circuit, and in the reverse position with the terminals of a cut-out for the
10 lamp, of a spring adapted, when unresisted, to lock the switch-arm in the second-described position, and a lamp operating by its weight to overcome the said spring, and reverse the switch.

15 4. In an arc-lighting system, the combination with a reversing switch-arm, cooperating in one of its positions with the terminals of a local lamp-circuit, and in the reverse position with the terminals of a cut-out for the
20 lamp, of a spring adapted, when unresisted, to lock the switch-arm in the second-described position, a lamp operating by its weight to overcome the said spring, and reverse the switch, and a handle on the switch-arm for manipulating it in either direction when the lamp is
25 in position.

5 5. In an arc-lighting system, the combination with a switch-arm, cooperating in one of its positions with a local lamp-circuit, and in
30 another position with a cut-out for the lamp, of a lock adapted to hold the switch-arm in the second-described position, a lamp acting by its weight to release the said lock, and a handle on the switch-arm for manipulating it
35 to either position when the lamp is in place.

6. In an arc-lighting system, a suitably-supported switch-arm adapted to cooperate in one of its positions with a local lamp-circuit, and in another position with a cut-out for the
40 lamp, and a hook or its equivalent attached to the locking device and adapted to receive a lamp.

7. In an arc-lighting system, a head or support carrying the lamp cut-out, and local
45 lamp-terminals, a switch-arm adapted to cooperate with both the cut-out and the terminals of the local circuit, a spring which, when unresisted, holds the cut-out closed, and a lamp supported so as to act in opposition to
50 the spring, the weight of the lamp being preponderating with respect to the spring.

8. In an arc-lighting system, a cut-out, a lamp, and a local lamp-circuit, in combination with terminals for the cut-out and the

local circuit, and a switch-arm or lever carrying contacts which are adapted to cooperate in the reverse positions of the lever with the cut-out terminals and the local-circuit terminals, a spring acting upon the said lever to hold its contacts normally against the
55 cut-out terminals, and intermediate devices between the spring and the lamp for supporting the latter, the weight of the lamp being preponderating with respect to the spring, whereby, when the lamp is in position, the
60 switch-arm can be moved to either of its extreme positions, whereas, when the lamp is removed, the spring asserts its control and closes the lamp cut-out.

9. In an arc-lighting system, a cut-out, a
70 switch-arm cooperating therewith, and a spring-actuated locking device for holding the switch-arm in cooperation with the cut-out, and a hook attached to the locking device, the hook and the switch-arm being
75 mounted in planes substantially at right angles to each other.

10. In an arc-lighting system, a suitable head or support, a loosely-pivoted hook dependent therefrom, the said hook having a
80 free movement in a backward direction, in combination with a switch-arm, a support for the said hook, and a spring acting upon the said switch-arm to determine its position when the spring is unresisted. 85

11. In an arc-lighting system, a suitable head or support, a loosely-pivoted hook dependent therefrom, the said hook having a free movement in a backward direction, in combination with a switch-arm, a support for
90 the said hook, a spring acting upon the said support to determine the position of the switch-arm when the spring is unresisted, and a lamp attached to the said hook.

12. In an arc-lighting system, a reversing
95 switch-arm, and cooperating terminals on opposite sides thereof, in combination with a locking device for holding the switch-arm in one extreme position, and a lamp acting by its weight to release the said locking device. 100

Signed at New York, in the county of New York and State of New York, this 12th day of July, A. D. 1900.

GEORGE RUPERT DAVISON.

Witnesses:

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