F. G. PROUTT.

ELECTRIC SWITCH CONTROLLING SYSTEM.

APPLICATION FILED SEPT. 13, 1904.

928,068.

Patented July 13, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

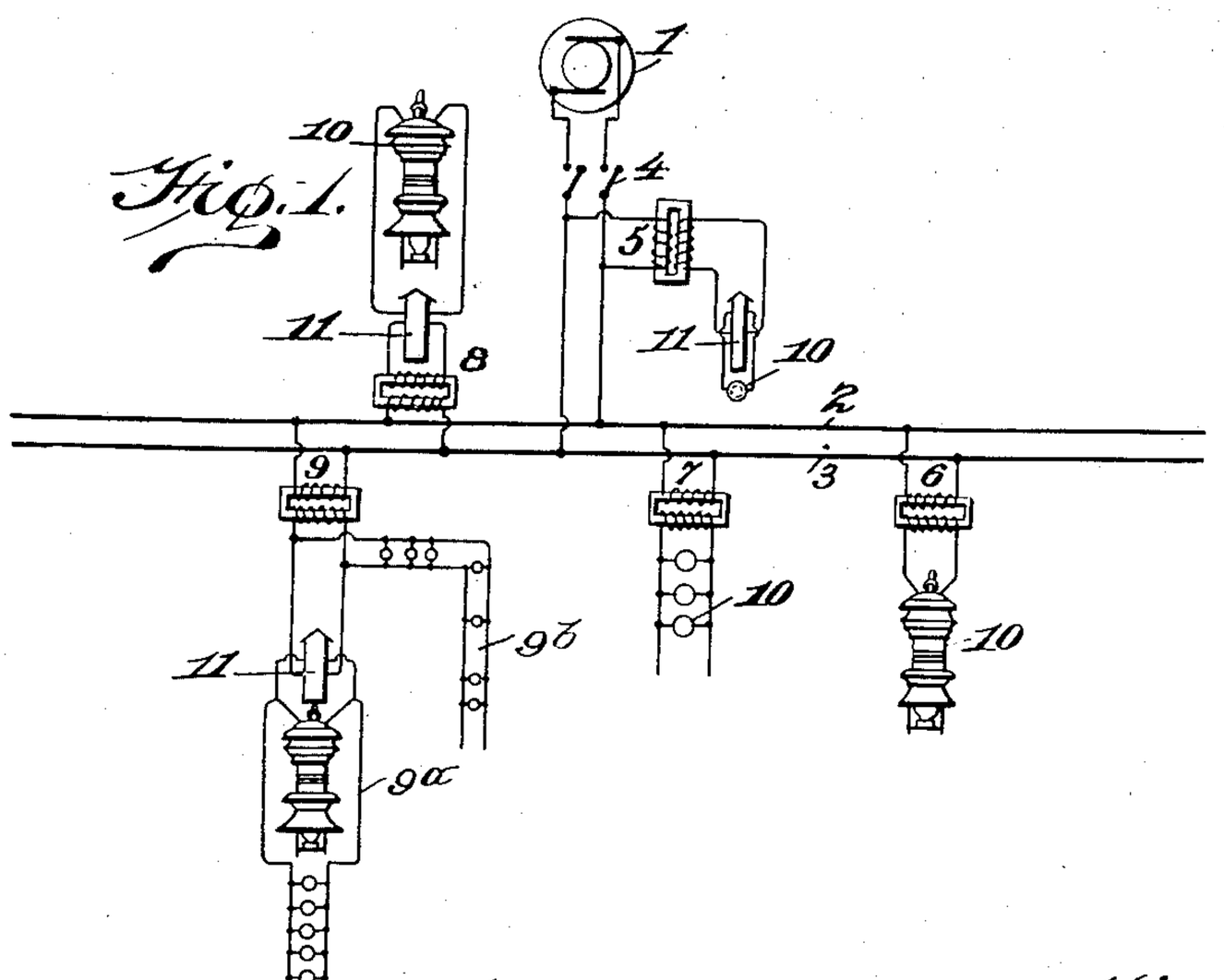



Fig. 2.

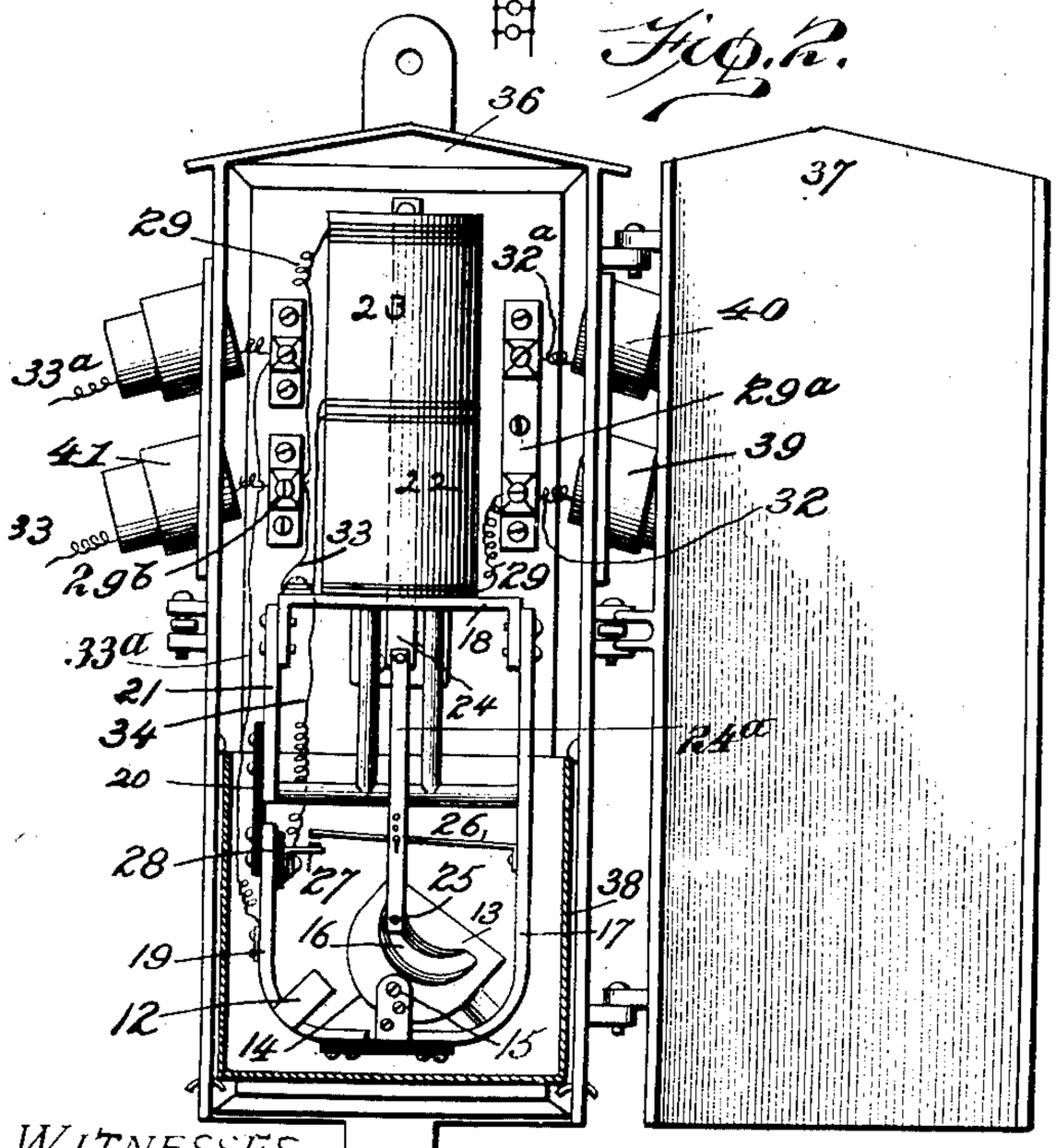
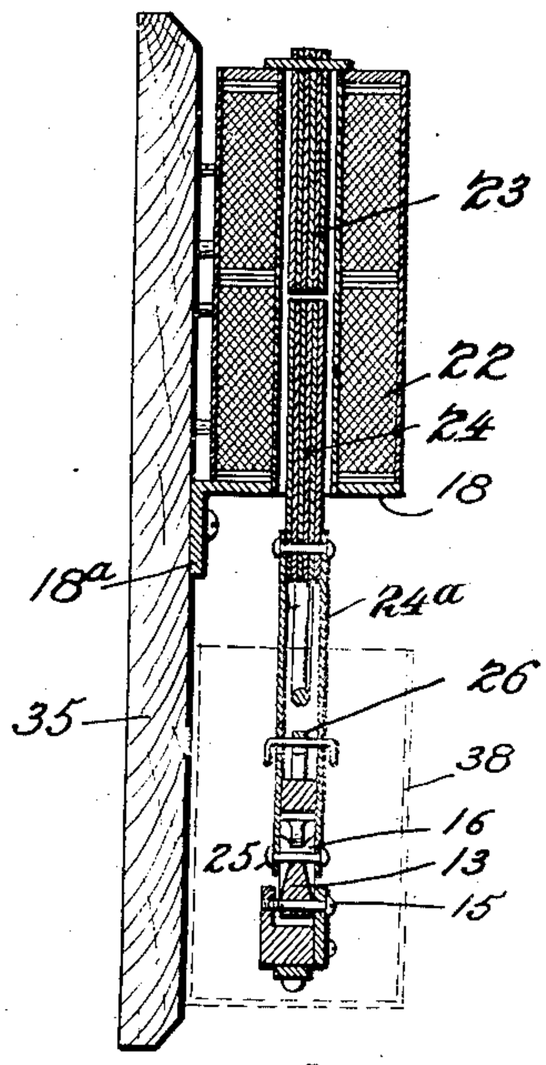



Fig. 3.

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2 SHEETS—SHEET 2.

Fig. 4.

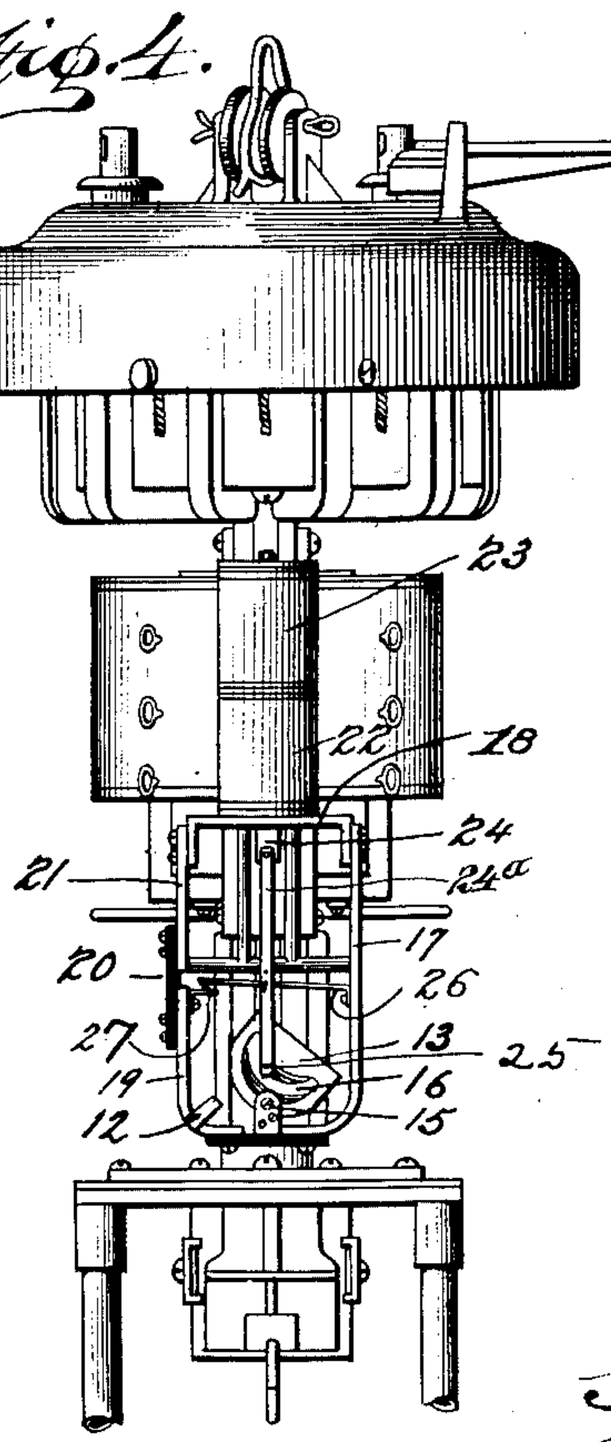



Fig. 5.

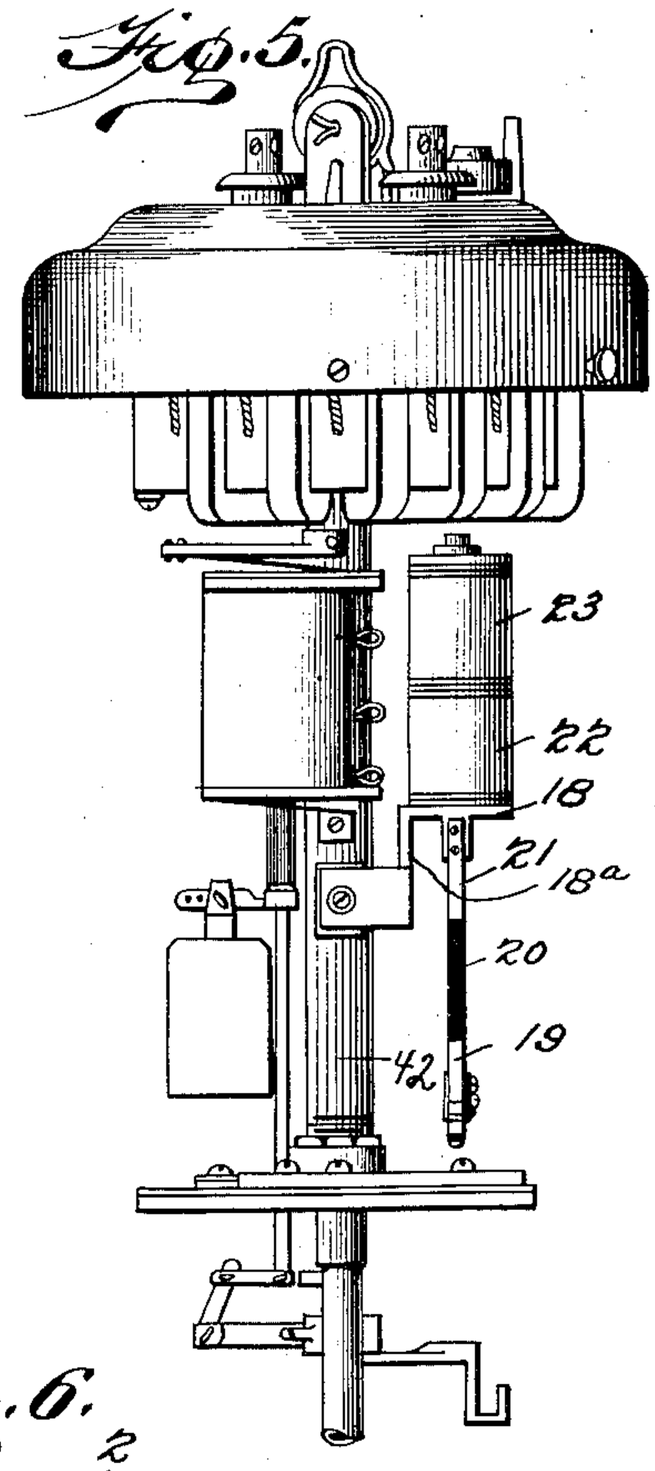
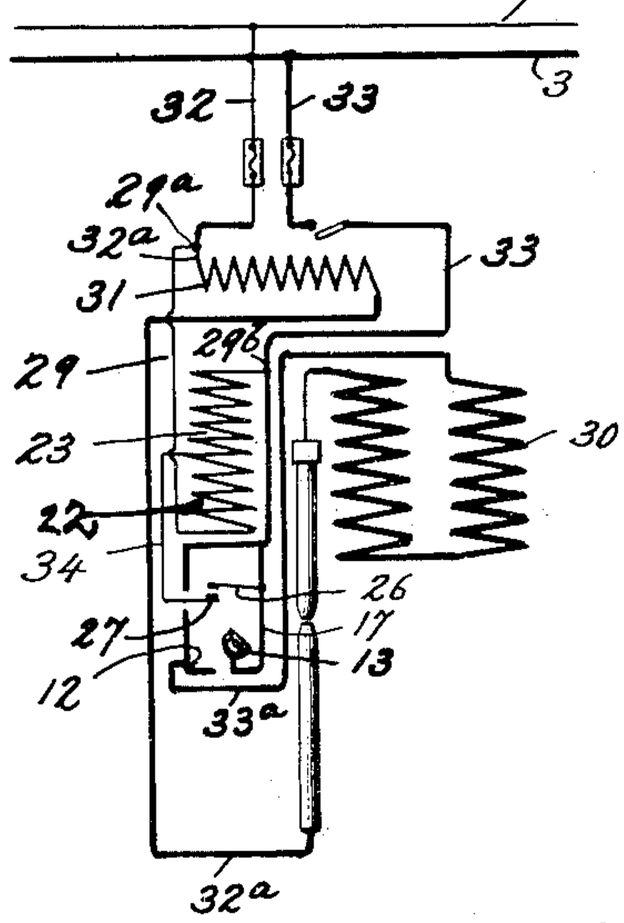



Fig. 6.

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# UNITED STATES PATENT OFFICE.

FREDERICK G. PROUTT, OF MEMPHIS, TENNESSEE.

## ELECTRIC-SWITCH-CONTROLLING SYSTEM.

No. 928,068. Specification of Letters Patent. Patented July 13, 1909.

Application filed September 13, 1904. Serial No. 224,314.

*To all whom it may concern:*

Be it known that I, FREDERICK G. PROUTT, a citizen of the United States, residing at 300 Second street, Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Electric-Switch-Controlling Systems, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification.

This invention relates to an electrical switch controlling system.

In some electrical circuits it is desirable to cut out or in some electrical devices, such as arc lamps used for street lighting, without disturbing other devices in the same circuit, such as lamps or motors used by private parties. For accomplishing this purpose I provide an electrical switch controlling system and a switch therefor, that employ only the two wires, the feed wire and the return wire, and that, upon one break and make of the electrical circuit formed by these wires, all switches in the electrical circuit are synchronously operated to cut out a device such as an arc lamp, and at the next break and make to cut in such a device.

Other objects and advantages will appear in the following description and will be more particularly pointed out in the appended claims.

While I shall herein show and describe my system and switch as applied to electrical lighting systems in which the lamps are arranged in multiple, it is to be understood that any other device or apparatus desired to be controlled from a central point may be employed.

In the drawings: Figure 1 is a diagrammatical view showing an electric lighting system employing my electrical switch control. Fig. 2 is a front elevation of one embodiment of my switch. Fig. 3 is a vertical section of an embodiment of my switch. Figs. 4 and 5 are respectively front and side elevations of an ordinary arc lamp with my switch mounted thereon, and Fig. 6 is a diagrammatical view of the circuits through one of my switches and through an arc lamp.

Referring more particularly to the drawings 1 indicates the generator, 2 and 3 the main distributing wires or conductors, 4 the current controlling switch, and 5, 6, 7, 8 and 9 the branch distributing circuits leading from the main distributing circuit. The branch circuit 5 contains one lamp 10 and a lamp controlling switch 11 and is employed for a pilot circuit. The branch circuit 6 is employed for street lighting and contains only one lamp 10 which carries its own controlling switch as shown in Figs. 4 and 5. The branch circuit 7 will supply private parties and may be used at any time, no lamp controlling switch being provided. In branch circuit 8 the lamp controlling switch 11 is mounted independently of the lamp, as shown in Figs. 2 and 3. While branch circuit 9 is itself divided into two sub-branches $9^a$ and $9^b$, the lamps in sub-branch $9^a$ being controlled by switch 11 and those in sub-branch $9^b$ being not affected by the switch 11.

In all illustrated embodiments of my invention the switch comprises a contact 12 and a movable blade 13, Fig. 4, both of which are in circuit with the lamp or lamps. The switch blade 13 consists of a plate curved on its lower edge at 14, pivoted at 15 near its middle lower portion, and provided above its pivot 15 with an arcuate slot 16 the ends of which extend upwardly approximately the same distance on each side of the pivot.

The switch blade 13 of the switch is carried by a conductor 17 suspended from one side of a conductor bracket 18 while the contact 12 is carried by the lower end of a conductor 19 which is suspended by means of an insulated strip 20 and a conductor 21 from the other side of the conductor bracket 18. The conductor bracket 18 has supported thereon but insulated therefrom, a solenoid winding 22 which in turn supports an electromagnet 23. A solenoid core 24 works within the solenoid winding 22 at its upper end, and at its lower end it is provided with a pivoted bifurcated section $24^a$ connected to the switch blade 13 by a pin 25 passing through the bifurcated end and through the arcuate slot 16 directly over the pivot 15. Secured to the conductor 17 is a contact arm 26 which is engaged by the solenoid core to move said arm to a contact 27 when the core is in its lower position, and to move it from the contact when the core is in its upper position, the contact 27 being secured to but insulated at 28 from the conductor 19. The windings of the solenoid 22 and the electro-

magnet 23 are in shunt with the line wires 32 and 33 (see Fig. 6) the shunt circuit 29 being connected at 29[a] to the line wire 32 and at 29[b] to the line wire 33, thereby shunt circuiting the lamp windings 30 and the lamp inductance 31. This placing of the windings of the solenoid 22 and the magnet 23 in shunt with the line wires causes as long as a current is passing through the line wires, the solenoid to be held in its upper position and the lower end of the said solenoid in either end of the arcuate slot 16. Upon the breaking of the circuit in the line wires, by operating the switch 4, the magnet 23 is deënergized and the solenoid is ineffective on the core 24, so said core by gravity drops, and in dropping the lower end will pass to one side of the arcuate slot 16 and the contact arm 26 will be thrown into engagement with contact 27. The contact 27 being connected by a conductor wire 34 with the upper end of the winding of the solenoid 22 in advance of the magnet 23 will short circuit the magnet 23 and cause the greater portion of the current in the shunt circuit 29 to pass through the solenoid when the switch 4 is operated to establish a current in the line wires, thereby increasing the lifting power of the solenoid. The switch blade 13 will, when the core 24 is raised, pass to the opposite position, and the contact between the arm 26 and contact 27 will be broken, thereby sending the shunt current equally through the solenoid 22 and electromagnet 23, thus increasing the holding power of the electromagnet.

In the embodiment of my invention shown in Figs. 2 and 3 the switch 11 is mounted independently of the arc lamp on a plate 35 by means of the bracket 18, the depending lug 18[a] being screwed to said plate 35. A housing 36 may surround the working parts of the switch and is closed by a door 37, while an oil cup 38 positioned in the lower part of the housing 36 around the contact 12, switch blade 13 and other working parts of the switch, contains oil by which the switch is kept in proper condition. The line wire 32 leads to a conductor plate 29[a] through a bushing 39 in the side of the casing, the main branch of the line wire 32 then running through the bushing 40 to the lamp inductance 31 and the lower carbons of the lamps. The shunt circuit 29 or other branch from the conductor plate 29[a] passes around the solenoid 22, then around the electromagnet 23 and connects with line wire 33 at binding post 29[b]. The line wire 33 enters through bushing 41 in another side of the casing and connects with binding post 29[b] from which it leads to conductor plate 18, conductor 17, and switch blade 13. When the switch blade 13 is in a closed position the current passes to contact 12 and by means of conductor 19, and wire 33[a] reaches the upper carbons of the lamps.

In Figs. 4 and 5 the circuits are the same as in Fig. 6 and the switch is mounted on an arc lamp, being connected by the depending end 18[a] of the conductor bracket 18 with any part of the lamp preferably to a standard 42 in the housing containing the operating mechanism of the lamp. The other parts of the lamp being of known construction are not described.

The operation of my invention is as follows: Starting with all the switch blades 13 being open as shown in Fig. 2 and all lights not controlled by switches 11 lighted or adapted to be lighted, and it is desired to light all electrical switch controlled lights: the current controlling switch is manipulated to momentarily break the circuit, causing all the cores 24 to drop and the lower sections 25 of each to move from the one end of the notch 16 to a point past the center of the notch on the other side. At the same time contacts 26 and 27 are thrown into engagement short circuiting the electromagnet 23. The current being turned immediately on the solenoid 22 lifts core 24 causing the lower end to ride to the opposite end of the slot 16 and shift the blade 13 to contact 12 thereby making the circuit through the switch controlled lamps. As the core 24 nears the upper part of its movement the contacts 26 and 27 are disengaged causing the shunt current to pass equally through the electromagnet 23 and the solenoid 22 which hold the core in this position until another break of the circuit. The positions of the switches throughout the system are obtained by looking at the pilot light or switch at the central station.

The constructions herein shown are for the purpose of illustration only and I therefore desire it to be understood that I am not to be limited to them and that I may make various changes within the scope of the appended claims in the form, proportion and details of construction without departing from the spirit or sacrificing any of the advantages of my invention.

Having thus described my invention what I claim and desire to secure by American Letters Patent is:

1. The combination of a shunt circuit for connection with the line wires in advance of the device to be controlled, a switch blade adapted to be connected in the circuit between the shunt circuit and the device to be controlled, a solenoid wrapped by the shunt circuit and controlling the switch blade, and an electromagnet also wrapped by the shunt circuit and holding the switch in either the open or the closed position.

2. The combination of a shunt circuit for connection with the line wires in advance of

the device to be controlled, a switch blade adapted to be connected in the circuit between the shunt circuit and the device to be controlled, a solenoid wrapped by the shunt circuit and controlling the switch blade, an electromagnet also wrapped by the shunt circuit and holding the switch in either the open or the closed position, and means for short circuiting the electromagnet before every operation of the solenoid.

The foregoing specification signed this 22nd day of August 1904.

FREDERICK G. PROUTT.

Witnesses:

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GEO. O. TURNLEY.