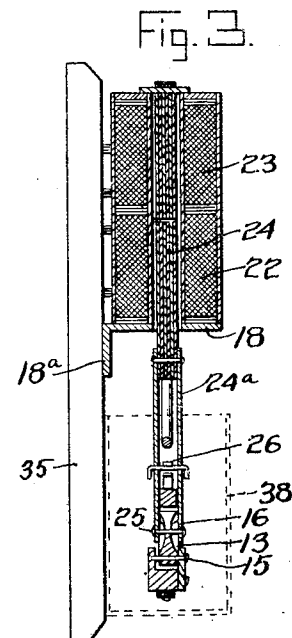
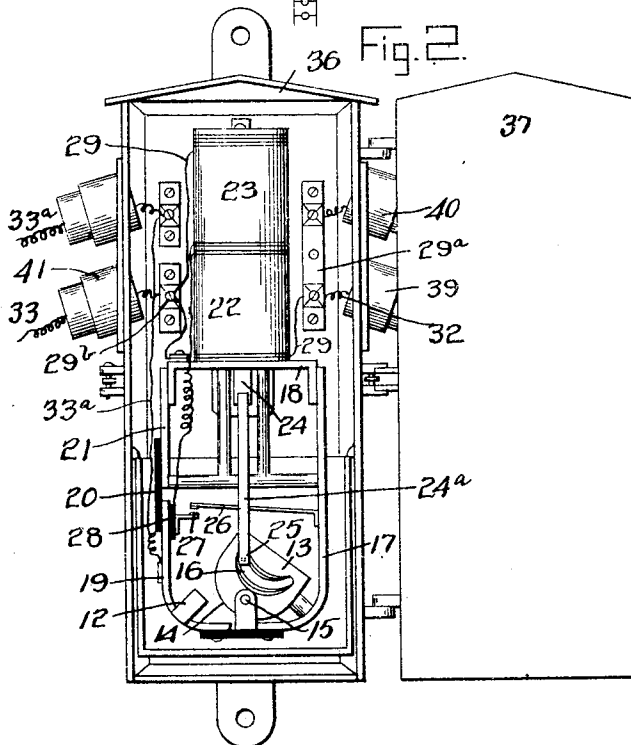
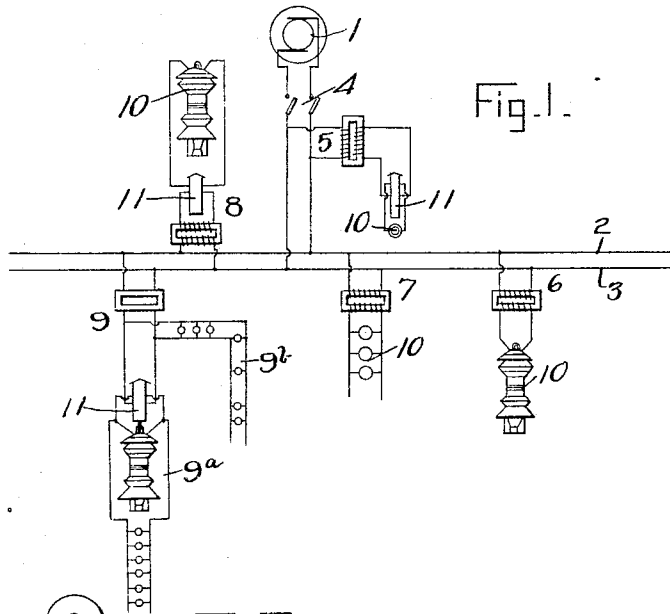


959,257.

2 SHEETS—SHEET 1.



Inventor

Frederick G. Proutt.

Witnesses

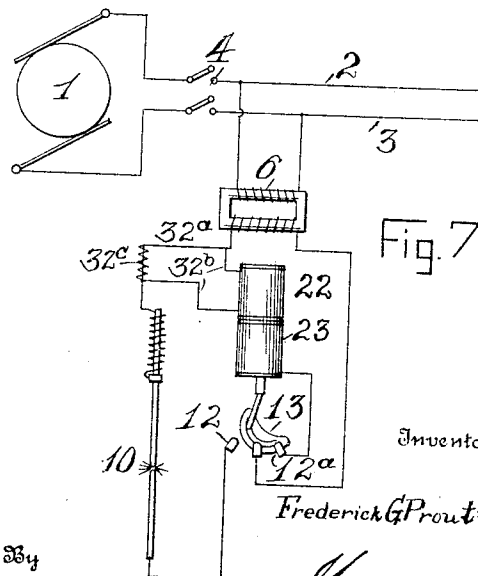
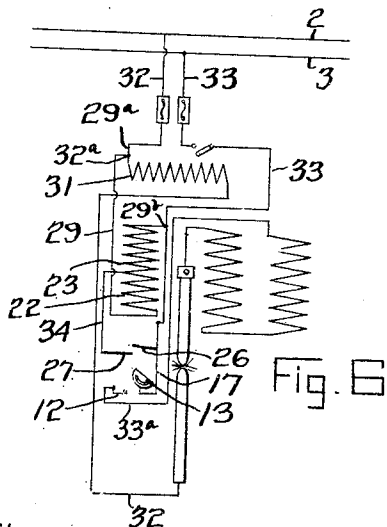
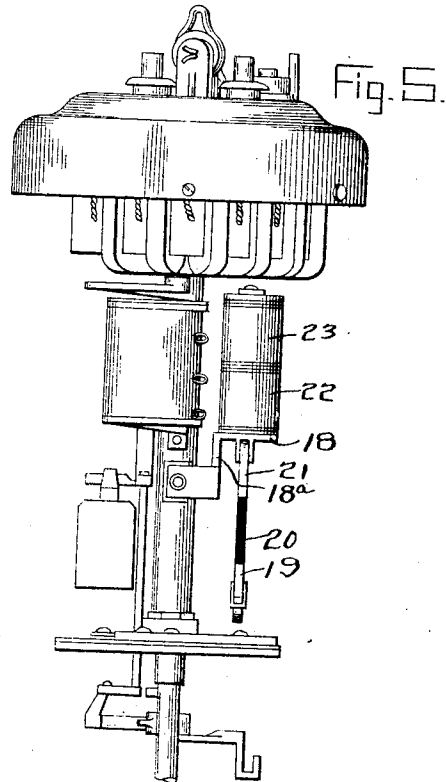
C. K. Reichenbach
J. M. Starks

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Knight Bros
Attorneys

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2 SHEETS—SHEET 2.



Witnesses

C. K. Kirchenbach.
J. M. Stynkoop

Inventor

Frederick G Proutt.

Knighton
Attorneys.

UNITED STATES PATENT OFFICE.

FREDERICK G. PROUTT, OF MEMPHIS, TENNESSEE.

ELECTRICALLY-ACTUATED SWITCH.

959,257.

Specification of Letters Patent.

Patented May 24, 1910.

Original application filed September 13, 1904, Serial No. 224,314. Divided and this application filed November 30, 1908. Serial No. 465,067.

To all whom it may concern:

Be it known that I, FREDERICK G. PROUTT, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Electrically-Actuated Switches, of which the following is a specification.

This application is a division of my application, Serial No. 224,314, filed September 13, 1904.

My invention relates to electrically-actuated circuit-controlling switches, and is designed primarily for use in controlling an electric circuit from a distant point, by transmitting or interrupting or varying the transmission of a current of electricity to the magnet of the switch, and particularly to a system of distant control wherein the switch is controlled through the circuit of the current consuming device which the switch is intended to cut in and out of circuit. In some installations of current supply it is desirable to cut in or out, from the central power station, some of the current consuming devices fed therefrom such as street lamps, while continuing to supply current for private or commercial use. For accomplishing this purpose, it has been proposed to arrange a system of current distribution wherein the circuits for the different classes of service are arranged in multiple relation to the main feed wires, or arranged as secondary circuits of suitable converters, fed by the main circuit, and to introduce in the circuits, to be controlled, switches designed to be actuated by varying the current supply of the main, as by suddenly opening and closing said main.

For the purpose of illustrating my invention, I have herein shown and described it as applied to a system of the kind above described, but I desire it understood that my invention is not limited to such use.

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 circuit through one

of my switches and through an arc lamp. 55
Fig. 7 is a modified arrangement of circuit wherein the switch magnet is arranged in series.

Referring more particularly to the drawings, 1 indicates the generator, 2 and 3 the 60
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 65
10 and a lamp controlling switch 11 and is employed for a pilot circuit, its lamp being within view of the operator of switch. The branch circuit 6 is employed for street lighting and contains only one lamp 10 which 70
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 switch controlled from a distance being provided. In branch cir- 75
cuit 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 80
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 85
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 90
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 95
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 21 100
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 105
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 electromagnet 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 deenergized 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 all of the current in the shunt circuit 29 to pass through the solenoid, thus strengthening the solenoid for the lift. When the switch 4 is operated to establish a current in the line wires, the switch blade 13 will be forced to its opposite position by the raising of the core 24 which simultaneously lifts the arm 26 from the contact 27 thereby causing the shunt current to flow equally through the solenoid 22 and electromagnet 23. The magnet and solenoid being now in series, the current consumption is greatly reduced while increasing the holding power of the magnet.

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 is connected through a bushing 41 in another side of the casing with binding post 29^b which is in turn connected with 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 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 shifting the blade 13 to contact 12 thereby making the circuit through the switch controlled lamps 10. 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 increased resistance greatly reduces the current flowing through the shunt, but still leaves ample to hold the core in this position until another break of the circuit. The position of the switches throughout the system is indicated by the pilot light 10 at the central station.

The constructions and system of circuit herein shown are for the purposes 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. Thus, the switch might be used in a series arrangement, such as shown in Fig. 7, wherein one impulse causes contact

of blade 13 with terminal 12, thereby throwing the solenoid 22 in series with the lamp, whereas the next impulse throws blade 13 into the terminal 12^a whereby the solenoid is thrown into series with the resistance coil 23 in a closed circuit entirely independent of the lamp, the lamp being cut out. In this arrangement, I prefer to place the solenoid 22 in the branch 32^b of the conductor 32^a, and introduce a resistance 32^c in said conductor 32^a in order to divert sufficient current to operate the solenoid 22.

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

1. An electrically operated switch comprising a switch blade pivoted below its center of gravity and provided with an arcuate slot above the point at which it is pivoted, a solenoid, and a core actuated by said solenoid and working in the arcuate slot of the switch blade.

2. An electrically operated switch comprising a switch blade pivoted below its center of gravity and having an arcuate slot extending on both sides above the pivot of the blade, and electrically operated means engaging with the walls of said slot.

3. An electrically operated switch comprising a pivoted switch blade having an arcuate slot extending on both sides of its pivot, a solenoid, a movable core actuated by the solenoid and operatively engaging the arcuate slot of the switch blade, and an electro-magnet above said solenoid and provided with a stationary core for holding the core in a raised position.

4. An electrically operated switch comprising a switch blade pivoted adjacent to its lower edge and having an arcuate slot extending on both sides of its pivot above the same, a solenoid, a core operatively connected with said solenoid and engaging the arcuate slot of the switch blade, an electro-magnet in series with the solenoid for holding the core in a raised position, and means for automatically short circuiting the electro-magnet when the core is released by the magnet.

5. A switch comprising a switch blade having an arcuate slot, a solenoid, a core having a pivoted section working in the slot, raised by the solenoid and lowered by gravity, an electro-magnet in series with said solenoid for holding the core in a raised position, and connections through which the solenoid may be energized independently of the magnet.

6. A switch comprising a switch blade having an arcuate slot, a solenoid, a core having a pivoted section working in the slot, said core being raised by the solenoid and dropping by gravity, an electro-magnet coaxially arranged with said solenoid and connected in series therewith, and means for automatically short circuiting the electro-magnet by the dropping core.

The foregoing specification signed at Memphis this 22nd day of August, 1908.

F. G. PROUTT.

In presence of—
A. J. MYERS,
H. G. FORD.