

C. P. RICHELLE.
ELECTRIC SWITCH.
APPLICATION FILED JAN. 13, 1917.

1,281,208.

Patented Oct. 8, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

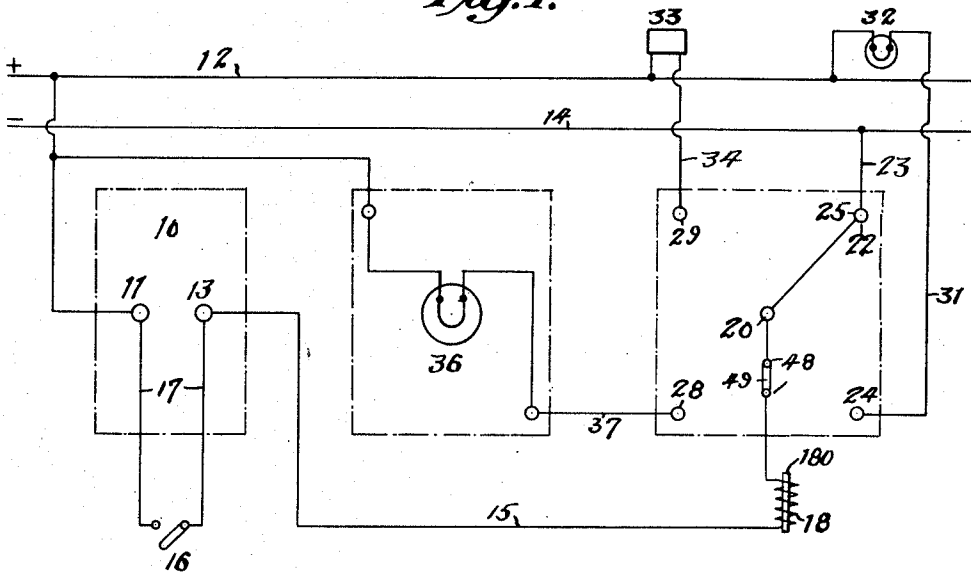


Fig. 2.

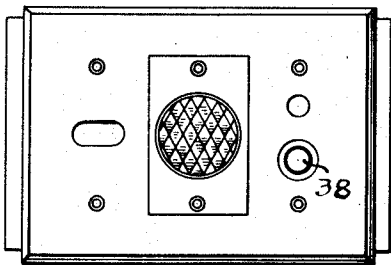
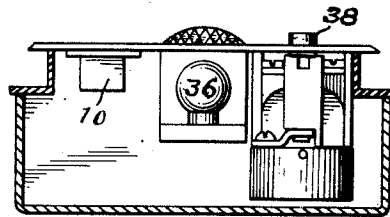


Fig. 3.



Attest:
Atm. Jones

Inventor:
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Hansen and Hansen Att'ys.

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2 SHEETS—SHEET 2.

Fig. 4.

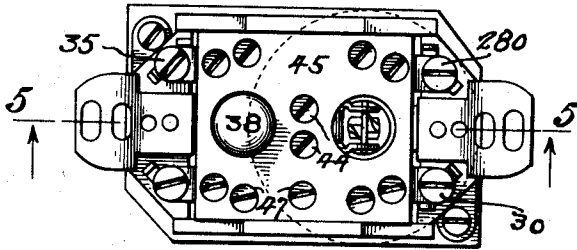


Fig. 7.

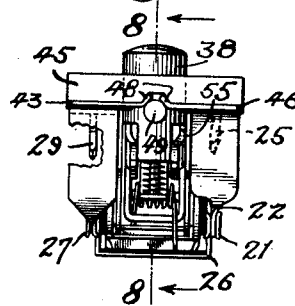


Fig. 5.

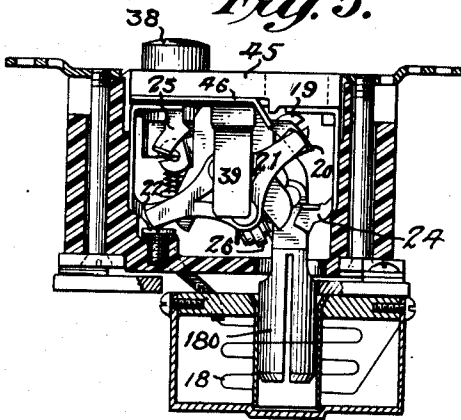


Fig. 8.

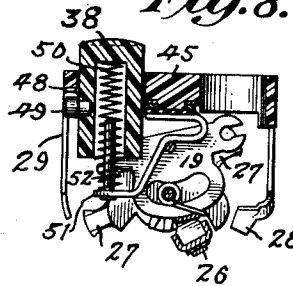


Fig. 6.

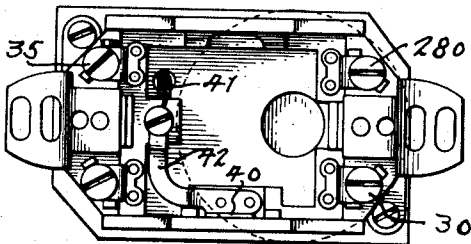
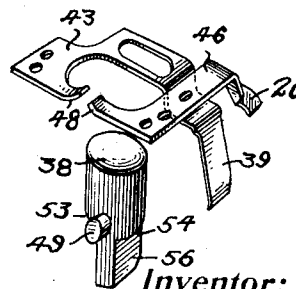


Fig. 9.



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[Signature]

Inventor:
by CARL P. RICHELLE
[Signature] Attys.

UNITED STATES PATENT OFFICE.

CARL P. RICHETELLE, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE BRYANT ELECTRIC COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

ELECTRIC SWITCH.

1,281,208.

Specification of Letters Patent.

Patented Oct. 8, 1918.

Application filed January 13, 1917. Serial No. 142,230.

To all whom it may concern:

Be it known that I, CARL P. RICHETELLE, a citizen of the United States of America, and residing at New Haven, in the county of New Haven and State of Connecticut, have invented a certain new and Improved Electric Switch, of which the following is a specification.

My invention relates to electric switches and particularly to switches of the remote control type shown in the patent to Bates No. 1,217,688, and the special object of my invention is to provide a safety device to protect the switch circuit against fuse blow outs due to improper use of the switch.

Referring to the accompanying drawings,

Figure 1 is a diagram of an installation in which the switch may be advantageously used;

Fig. 2 is a plan view of the control devices of an installation such as shown in Fig. 1;

Fig. 3 is a cross section through the outlet box of this installation;

Fig. 4 is a plan of the switch alone with the cover plate removed;

Fig. 5 is a vertical section on the line 5-5, Fig. 4;

Fig. 6 is a plan of the switch body with the mechanism removed;

Fig. 7 is a broken end elevation of the switch mechanism by itself;

Fig. 8 is a longitudinal section there-through;

Fig. 9 is a perspective of a detail of the switch construction to which the invention particularly relates.

While switches of the present type are adapted for various uses, they have been employed to the greatest extent in hospital installations of the character diagrammatically illustrated in Fig. 1. This installation comprises an attachment plug receptacle 10, one terminal 11 of which is connected to the positive main 12, while the other terminal 13 is connected to the negative main 14 through the lead 15 and the switch to which the present invention relates. A hospital installation of this type contemplates an easily operated (remote control) bed switch 16, the leads 17 to which are tapped from the receptacle 10 by means of an attachment plug of ordinary type. Upon closing the bed switch 16, the circuit is completed

through the lead 15 to a flush wall switch of the general character shown in the Bates patent above mentioned. The circuit passes through a solenoid coil 18, (the core 180 of which is attached to the rock bar 19 of the switch mechanism), to the solenoid terminal 20, thence through the switch by the blade 21 to the terminal 22 connected by the lead 23 to the negative main 14. This is the normal position of the switch, so that the closing of the bed switch 16 energizes the solenoid and draws down the core 180 thereof, thus operating the switch mechanism and shifting the switch blade 21 to its other position. In the latter position it bridges the terminals 24 and 25 and is connected by the strap 26 to the corresponding blade 27 on the opposite side of the switch, which now spans the switch terminals 28 and 29. In this position of the switch the circuit is broken through the lead 15, but a connection from main 12 to one of the regular wire terminals of the switch is made at 30 through the lead 31 connected through the door lamp 32 to the wire terminal 30 by which the current is led to the switch terminal 24 now connected by the blade 21 to the switch terminal 25 (integral with 22) and thence by lead 23 to main 14. A second circuit is led through the switch from an annunciator 33 by wire 34 connected at the binding post corresponding to the switch terminal 29, the current passing from the latter through the switch blade 27, strap 26 and blade 21 to the same terminal 25. A third branch may be led through a signal light 36, the lead 37 of which is connected to the binding screw corresponding to the switch terminal 28 and thence through the bridge piece 26 and blade 21 to the terminal 25. It will thus be seen that the switch is a multiple single pole switch, the connection between the blades being established through the bridge piece 26, three of the regular switch terminals, viz. 24, 28 and 29 being connected to the positive main and one, viz. 25, being connected to the negative main. In this respect the switch is like that of the Bates Patent No. 1,127,379 of Feb. 2, 1915.

Under ordinary conditions it would never happen that both the bed switch 16 and the push button 38 for returning the switch to the normal position are simultaneously operated. Nevertheless the possibility of the

occurrence introduces an element of danger into the circuit, since the switch circuit is not designed to stand the strain of a continuous current through the solenoid coil, an occurrence which would result were the switch held positively against return movement by the depression of the button 38 simultaneously with the actuation of the bed switch 16. When this coincidence does occur, it is very apt to result in blowing the fuses which protect the circuit. To eliminate this danger I have introduced into the switch construction an element of safety which prevents this occurrence by breaking the solenoid circuit on depression of the push button 38. It is thus impossible to maintain the circuit through the solenoid coil while the switch is held positively against operation. This I have accomplished by the modifications of construction illustrated in the accompanying drawings.

On reference to the Bates invention it will be noted that the connection of the solenoid terminal 20 is direct with the standard 39 which contacts with the plate 40 to which the end 41 of the solenoid winding 18 is electrically connected by the strap 42. I have in the present construction broken this connection by carrying the strap 39 across the switch in the form of a plate 43 secured by screws 44 to the insulating base 45 on which the switch mechanism is mounted. The terminal 20 is formed on an independent plate 46 secured by the screws 47 to the base 45. The plates 43 and 46 have tongues 48 which approach each other at a point adjacent the push button 38 and the latter is provided with a metal stud 49 which, when the button is in its "out" position, engages the two tongues 48 and forms a connecting bridge therebetween, but which on the depression of the button breaks the connection between the tongues 48 by moving out of contact therewith. The push button 38 instead of being directly connected to the rocker bar 19 as heretofore, is constantly pressed outward by the spring 50 arranged within the same and bearing at its lower end against an auxiliary supporting plate 51 secured to the base 45 and angled down beneath the push button. A guide pin 52 may be carried by the plate 51, if desired. On the depression of the push button its shoulders 53-54 bear against the wings 55 of the rocker bar and afford an operative engagement therewith. The button may be carried downward in the form of a tongue 56 lying between the rocker wings and serving to guide the push button.

The operation of the switch is readily understood from the preceding description. Assuming the switch to be in the position shown in Fig. 5, the closing of the bed switch 16 energizes the coil 18 and tends to throw the switch plate 21 to its second position in which it spans the terminals 24 and

25. If, however, this movement of the switch blade is restrained by physical force, that is to say, by the depression of the push button 38, which would hold the rocker bar from movement on the pull of the solenoid core 180, the solenoid circuit is broken at the tongues 48 and it is consequently impossible for the current to flow through the solenoid coil until the button 38 has been returned to its normal position and the circuit reestablished by the engagement of the tongues 48, by the pin 49. In this position of the push button, the rocker bar 19 is freed from restraint and responds at once to the pull of the solenoid core 180, thus shifting the switch to the second position and automatically breaking the circuit through the solenoid at the contact 20. The circuits are now completed through the door light 32, annunciator 33 and bull's-eye 36 until the attendant, reaching the bed-side, depresses the push button 38 thus returning the switch to original position (Fig. 5) with the circuit completed through terminals 20 and 22, but broken at the bed switch 16, which must be again operated before the switch is again actuated.

Various devices for accomplishing this result will readily occur to those skilled in the art without departing from what I claim as my invention.

I claim as my invention:—

1. An electric switch having electro-magnetically operated switch mechanism and means at the switch automatically interrupting the electro-magnet circuit when the mechanism is manually held against operation.

2. An electric switch having a switch mechanism manually operated in one direction and electro-magnetically operated in another direction and means temporarily interrupting the electro-magnet circuit when the manual operating means are actuated.

3. An electric switch having a manually operated member for actuating the switch in one direction, and a magnetically operated member for actuating the switch in another direction, a normally closed contact device associated with the manually operated member through which device the electro-magnet circuit is led, said circuit being opened at the contact device when the manually operated member is actuated.

4. In an electric switch, a push button for actuating the switch in one direction, a conductor carried by said push button, contact means normally engaged by said conductor when the button is in inoperative position, together with an electro-magnet having its circuit led through said conductor and contact means, and a member actuated by said magnet for operating the switch in another direction.

5. In an electric switch, a push button for

actuating the switch in one direction, a bridging member carried by said push button, a pair of spaced contacts normally connected by said conductor when the button is in inoperative position, together with an electro-magnet having its circuit led through said contacts, and a member actuated by said magnet for operating the switch in another direction.

6. An electric switch having a push button for actuating the switch in one direction, spring means for maintaining said button normally in "out" position, a conductor carried by said push button, contact means engaged by said conductor in "out" position of the button, an electro-magnet having its circuit led through said contact means, and

a member actuated by said magnet for operating the switch in another direction.

7. In an electric switch, a wire terminal and a switch terminal associated therewith, a push button for operating the switch mechanism, and a normally closed circuit breaker interposed between said wire and switch terminals and actuated by the operation of said push button.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

CARL P. RICHETELLE.

Witnesses:

C. A. BATES,
H. M. WICHERT.