June 30, 1925.

1,544,446

G. W. GOODRIDGE

ELECTRIC SWITCH

Filed June 22, 1923

Fig.1.

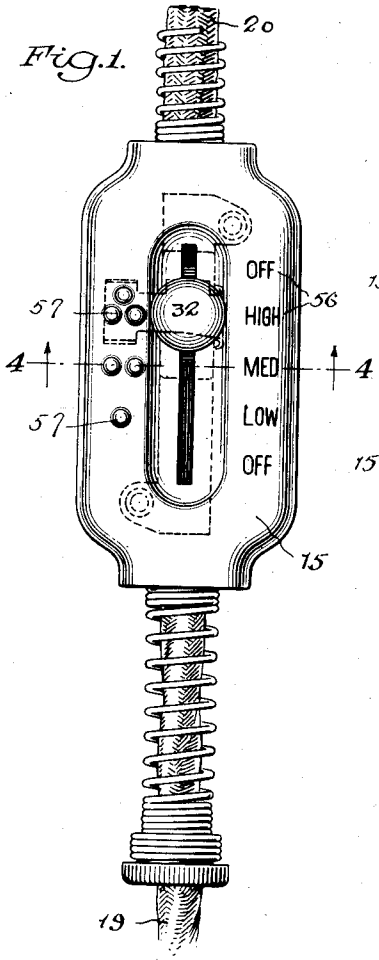



Fig.2.

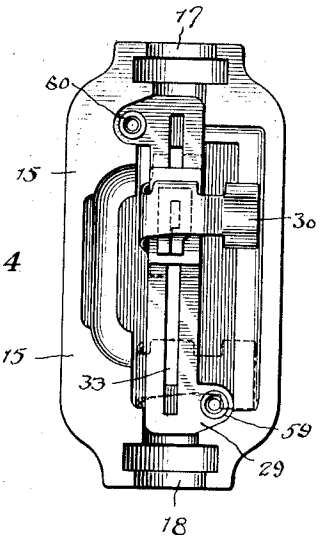



Fig.3.

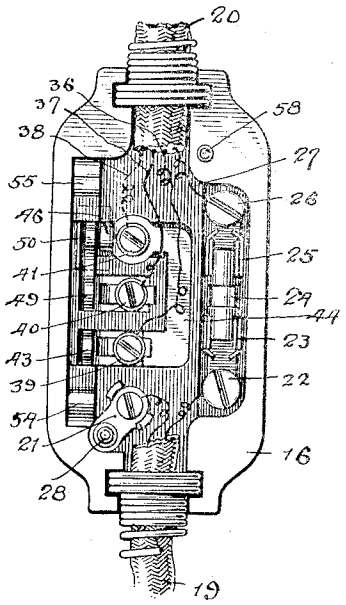



Fig.4.

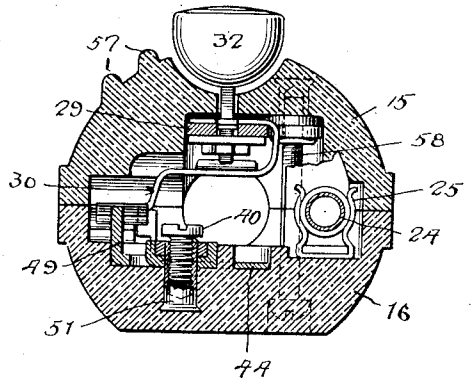



Fig.5.

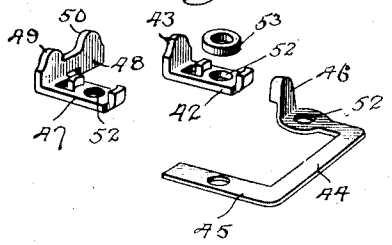
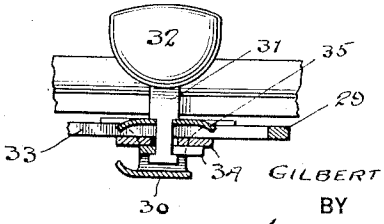



Fig.6.




INVENTOR

GILBERT W. GOODRIDGE

BY

ATTORNEYS

Patented June 30, 1925. 1,544,446

# UNITED STATES PATENT OFFICE.

GILBERT W. GOODRIDGE, OF FAIRFIELD, CONNECTICUT, ASSIGNOR TO THE BRYANT ELECTRIC COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

## ELECTRIC SWITCH.

Application filed June 22, 1923. Serial No. 647,115.

*To all whom it may concern:*

Be it known that I, GILBERT W. GOODRIDGE, a citizen of the United States, residing at Fairfield, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

My invention relates to electric switches and particularly to switches of the "feed through" type adapted to be arranged between cable ends. The object of my invention is to provide a switch of this type for use with heater devices employing a plurality of resistance circuits which may be selectively energized by the switch.

In the accompanying drawings—

Fig. 1 is a plan view of a switch in which my invention is embodied in one form;

Figs. 2 and 3 are interior plan views of the cover and base blocks of the switch body and their associated parts;

Fig. 4 is a section on the line 4—4, Fig. 1;

Fig. 5 is a perspective of certain of the switch contacts; and

Fig. 6 is a partial longitudinal section through the sliding contact.

For the selective energization of the several resistance circuits of a heater pad or other heating appliance, it has been heretofore customary to employ a multi-position separable plug connector having its contacts appropriately arranged for the purpose, or a switch having a pivoted multi-position lever which swings over a series of contacts establishing the different circuit connections. Both of these types have disadvantages and inconveniences which the present invention obviates. The present switch is compact and convenient and is operated by a rectilinearly slidable push button. The construction is such, moreover, that the nature of the contacts may be readily changed to adapt the switch to different types of heater resistance circuits without modification of the switch body. The switch is also provided with a suitably housed fuse, so located that the symmetry of the casing is not affected.

As here shown the switch comprises an elongated insulating body, longitudinally divided into cover and base blocks 15 and 16 recessed on their meeting faces to house the binding screw connections, the switch mechanism and the fuse. Channels 17 and 18 formed at the opposite ends of the blocks receive the cable ends 19 and 20. The wire connections are all mounted upon the base block 16 and the bared wires of the cable main 19 are attached to the binding terminals 21 and 22 respectively. Associated with the terminal 22 is a fuse clip 23 for the reception of the ferrule at one end of the fuse cartridge 24, the ferrule at the opposite end of the cartridge being received in the clip 25 associated with the terminal 26 for the wire 27 of the distributing cable 20 leading to the heater appliance (not shown). The terminal 21 for the other wire of the main 19 is connected by the screw 28 to a slide bar 29 mounted upon the cover block 15 and on which rides the switch brush 30. The latter is here indicated as formed from spring sheet metal, one end of which is angled over the slide bar 29 and forms a saddle which is pressed into engagement with the slide bar 29 by the stem 31 of the exterior button 32 which, passing through a slot in the cover, and the registering slot 33 in the slide bar, is offset beneath spring washers 34 underlying the slide bar. In order to hold the contact saddle against swivelling, it is slotted, and guide fingers 35 offset downward therefrom into the slot 33.

The wires 36, 37 of the distributing cable 20 are respectively connected to the binding terminals 39, 40 on the base block 16. If the heater resistance is of the type in which three distinct coils are employed, a third distributing wire 38 is connected by binding screw 41 to one of the three terminals which in this case are preferably all of the same construction, such as indicated at 42 in Fig. 5, that is to say, each terminal comprises a single offset contact flange 43, the three terminal flanges being aligned and successively engaged by the switch brush 30 as it moves longitudinally on the slide bar 29.

However, I have illustrated terminals suitable for that type of heater in which the different heats are attained by passing the current through the same resistance coils in different circuit connections well known in the art. For this purpose the terminal 42 has associated therewith a strap 44, the end 45 of which underlies the base of the terminal 42, while the other end of the strap is provided with an offset contact end 46. The adjacent terminal 47 is pro-

vided with a contact flange 48 having two contact points 49 and 50 longitudinally spaced on the base, the contact point 50 lying in register with the contact wing 46 of the strap 44 and being simultaneously engaged thereby. It is thus apparent that when the brush 30 engages the contact point 50, and simultaneously the contact flange 46 of the strap 44, the current flows through all of the distributing wires 36, 37 and 38 as well as through the fused side 27 of the line; whereas, when the brush engages only the contact point 49, the circuit is through the branches 27 and 37; while when the brush is in engagement with the contact 43, the circuit is through the branches 27 and 36 alone. Inasmuch as the circuit through a heater device of this type is well known, the circuit connections need not be further explained.

The particular form of the wire terminals may be variously modified, as well as their mounting upon the base. I prefer, however, to mould into the base block 16 a series of studs 51 which project upward into the several terminal-receiving recesses in the inner face thereof, each of the terminals being apertured at 52 to fit over the projecting end of its stud. Washers 53 closely engaging the stud, may be slipped over the latter to aid in retaining the terminals in position, and also to afford suitable abutments against which the ends of the wires are clamped by the several binding screws which enter the tapped ends of the studs.

In order to detain the brush 30 in engagement with each of the switch contacts, the latter are shaped to form noses to which the engaging face of the brush 30 is shaped, and thus properly located and detained. The slide 29 is of sufficient over-all length to permit the contact brush to move to "off" position at each end of its travel. To hold the brush in such "off" position, ribs 54 and 55 are formed on the ledges of the block 16 upon which the brush rides after leaving the contacts.

Inasmuch as the switch is often operated in the dark, I provide in addition to the legends 56 on the outer face of the cover block 15, a series of bosses 57 corresponding in position to the legends "Low," "Medium" and "High," the bosses differing in number so that by the sense of touch the location of the switch button 32 may be readily determined. The cover block is preferably channelled, as shown, to receive and guide the button.

Inasmuch as all of the wiring connections are made on the base block 16, while the switch brush 30 is carried by the slide on the cover plate 15, the wiring connections are readily made when the two blocks have been separated. They are normally united by screws 28 and 58, the former serving also to establish electrical connection between the binding terminal 21 and the slide 29. The slide is preferably mounted on the cover plate 15 by means of tapped rivets 59 and 60 which receive the holding screws.

The structure as a whole is rugged, serviceable, compact and convenient. The feature of interchangeability of the wiring contacts is one of considerable merit from a manufacturing standpoint, since the same switch body and brush can be used, with no change in the switch structure whatsoever, except the substitution of uniform terminal plates 42 for the variants 47 and 44 shown in the drawing.

Various modifications in detail of construction and arrangement of parts will readily occur to those dealing with the problem, without departing from the underlying thoughts which I claim as my invention.

I claim—

1. An electric switch comprising an insulating body longitudinally divided into base and cover blocks, a slide carried by the cover block, a switch brush slidably mounted on said slide, and a group of contacts mounted on the base block and adapted to be successively engaged by said brush.

2. An electric switch comprising an insulating body longitudinally divided into base and cover blocks, a slide carried by the cover block, a switch brush slidably mounted on said slide, and a group of contacts mounted on the base block and adapted to be successively engaged by said brush, the path of said brush extending beyond the area of the contacts to circuit-breaking position.

3. An electric switch comprising an insulating body longitudinally divided into base and cover blocks, a slide carried by the cover block, a switch brush slidably mounted on said slide, and a group of contacts mounted on the base block and adapted to be successively engaged by said brush, the path of said brush extending at each end beyond the area of the contacts to circuit-breaking position.

4. An electric switch comprising an insulating body longitudinally divided into base and cover blocks, a slide carried by the cover block, a switch brush slidably mounted on said slide, and a group of contacts mounted on the base block and adapted to be successively engaged by said brush, the path of said brush extending beyond the area of the contacts to circuit-breaking position, said contacts being shaped to afford a detaining engagement with the brush, and means engaged by the brush in circuit-breaking position to detain the same.

5. An electric switch comprising an insulating base recessed to accommodate a series of longitudinally arranged switch contacts, a ledge at the end of said recess, together

with a sliding brush adapted for successive engagement with said contacts, but having a travel extending beyond the end of said recess and over said ledge, and means on said ledge to engage and detain said contact brush.

6. In an electric switch, an insulating body comprising base and cover blocks, wire terminals and switch contacts arranged on the base block, a slide arranged on the cover block, a switch brush riding on said slide, and means passing through the cover block for operating the switch brush, together with securing means for connecting said blocks together and establishing electrical connection between one of the wire terminals and the slide.

7. In an electric switch, an insulating block recessed on its inner face to accommodate a slide, said block and slide being longitudinally slotted in register, together with an exterior operating member working in said slot, a switch brush, and means associated with said operating member for securing said brush in good electrical connection with said slide.

8. In an electric switch, an insulating body comprising cover and base blocks recessed on their meeting faces to afford a longitudinally extending switch chamber, a slide centrally arranged on the inner face of the cover block, a series of switch contacts arranged in the base block and extending longitudinally of the chamber at one side thereof, in combination with a switch brush working in said slide and having a spring arm extending from the slide into engagement with the switch contacts.

In testimony whereof I have signed my name to this specification.

GILBERT W. GOODRIDGE.