

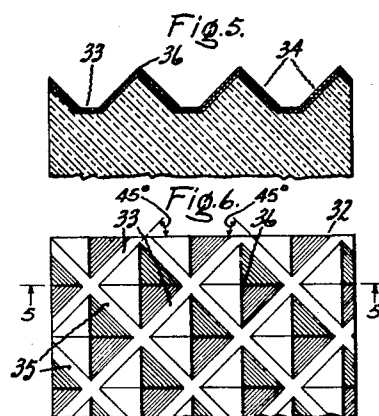
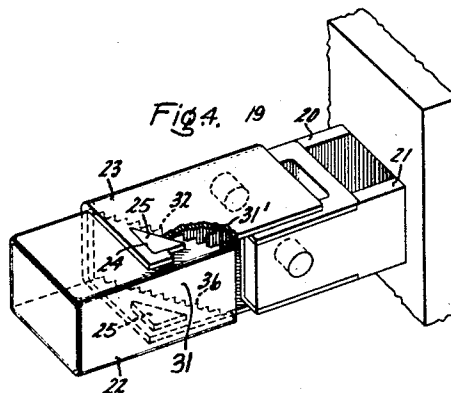
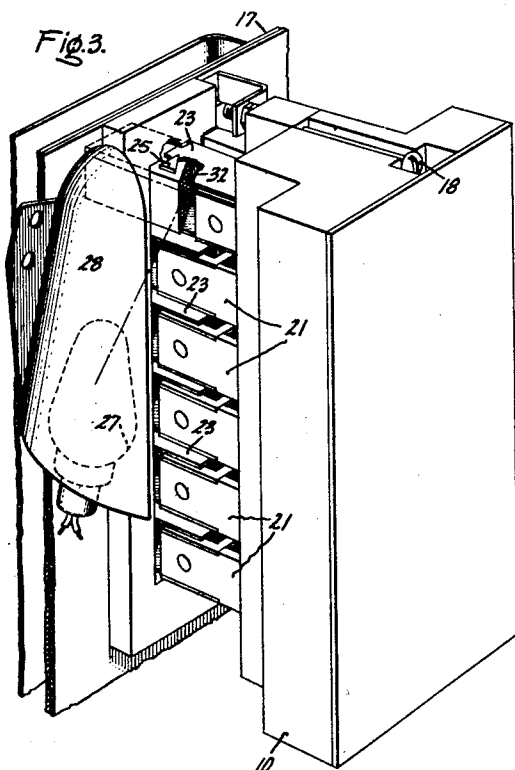
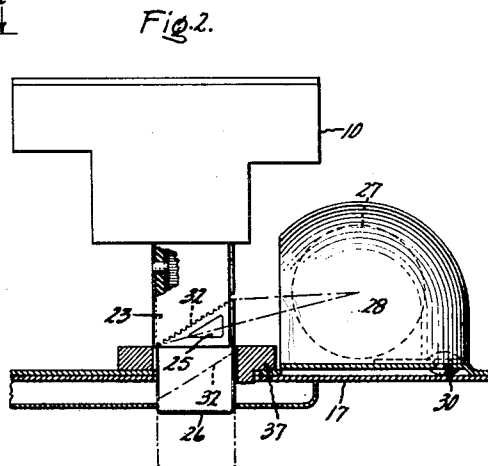
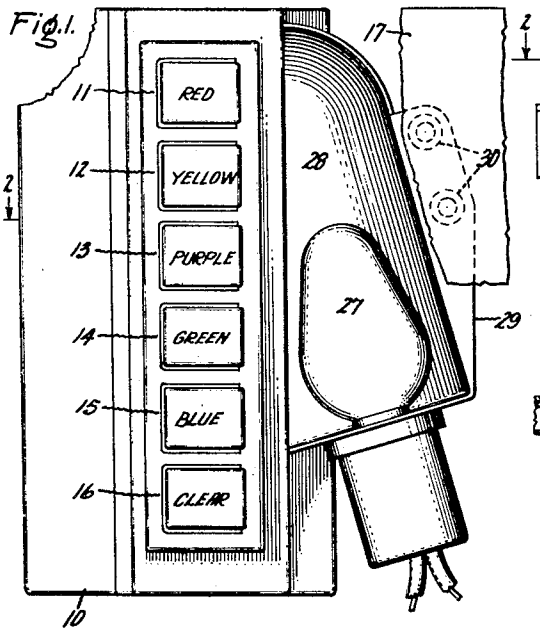
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2,437,555

PUSH BUTTON SWITCH

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UNITED STATES PATENT OFFICE

2,437,555

PUSH-BUTTON SWITCH

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2 Claims. (Cl. 200—167)

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The present invention relates to push button switches having a plurality of push buttons for selectively closing any one of a plurality of electric circuits such as are used, for example, in connection with kitchen ranges in which heating units often include two heating coils to be connected singly, or in series or parallel to, 110 or 220 volts in order to produce different heat outputs. More specifically, my invention relates to switches with push buttons made of transparent or translucent material and including a light source for illuminating each push button in its "on" position. Limited space may make it necessary to provide a light source in the form of a miniature lamp requiring a special arrangement to obtain substantially uniform illumination of all push buttons and maximum light transmission through the buttons.

The object of my invention is to provide an improved construction and arrangement of push button switches of the type above specified whereby clear, visual indication of the various push buttons in their actuated position is assured.

For a consideration of what I believe to be novel and my invention, attention is directed to the following description and the claims appended thereto in connection with the accompanying drawing.

In the drawing Fig. 1 illustrates a push button switch embodying my invention; Fig. 2 is a section along lines 2—2 of Fig. 1; Fig. 3 is a perspective view from the rear of the switch; Fig. 4 is a perspective detail view of a part of the switch; Fig. 5 is a section through the light-reflecting portion of a button; and Fig. 6 is a plane view of the light-reflecting surfaces of a button, Fig. 5 being a section along line 5—5 of Fig. 6.

The push button switch comprises a base 10 made of plastic or like insulating material and carrying a number of push buttons 11 to 15 inclusive. The switch in the present example is mounted on a panel 17, which may form part of the back-splash of a kitchen range, by means including screws 18.

Push button 16 is an "off" button, disconnecting or opening any circuit that may have been formed by any of the other buttons 11 to 15. Each of the other buttons 11 to 15 serves to close one of several circuits and to open a circuit previously made by another button. Thus, if the push button 12 is forced in, a circuit is closed, and if subsequently the button 11 is forced in, the circuit previously made by the button 12 is opened and a new circuit is established by action of the button 11. To this end the various push

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buttons are interlocked by suitable interlocking means such as slides. An arrangement of this kind is more fully disclosed in the application of J. L. Andrews, Ser. No. 569,296, filed on the same date and assigned to the same assignee as the present application, now Patent No. 2,431,904, issued Dec. 2, 1947, to which reference is made for details of the circuit arrangement not shown here because they do not form a particular part of my invention.

Each push button comprises a plunger 19 having a pair of legs 20, 21 for actuating slides, not shown, and a light-reflecting prism 22 secured to and supported on the legs by means including a U-shaped connecting member 23 which at one end is suitably fastened to the legs 20, 21 and at the other end forms lugs 24 with openings for receiving projections 25 formed on opposite sides of the prism 22. The prism 22 has a top or end surface 26 for manual engagement to push the button into the base to close a circuit. The prism or button proper is in the form of a right angle totally reflecting prism made of transparent material, preferably of the plastic type such as polymethyl methacrylate although other materials such as glass or quartz might be used. Light is directed towards the prisms by a source 27 in the form of a miniature lamp with an output of about 7 watts supported in a reflector 28 having a flange 29 which in the present instance is attached to the wall 17 by means of screws 30. Each prism has a front wall or surface 31 exposed to the light from the lamp 27 and a reflecting surface or hypotenuse 32 at an acute angle to the front wall 31 for reflecting light towards the top.

The light-reflecting surface 32 according to my invention has a plurality of parallel grooves 33, Fig. 5, forming prismatic projections 34 (Fig. 5) between them. The projections 34 and the grooves 33 are essentially V-shaped with opposite sides forming angles of about 90 degrees. Each groove extends at an angle of about 45 degrees towards the outer surface 31' of the prism. In addition to the set of parallel grooves 33 I provide in a preferred embodiment, as shown, a second set of parallel grooves 35 arranged perpendicular to the first set of grooves. Thus the two sets of parallel grooves 33 and 35 form a plurality of prisms 36 between them, assuring maximum reflection and diffusion of light towards the top 26 of the button and producing a sparkling effect. This light-reflection is further improved by the provision of a suitable coating or coatings on the light-reflecting surface of the prism. In a preferred embodiment I provide the

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light-reflecting surface with two coatings, a first coating of transparent or colored lacquer and a second coating of silver.

In many instances it is desirable to provide different colors for different buttons as a further visual indication of the circuit which is closed and in case of a kitchen range of the heat that is being produced. In the arrangement of Fig. 1 the different buttons have been designated with their respective colors red, yellow, purple, green, blue and clear. The clear button which is the "off" button has a prism with grooved or knurled reflecting surface covered by a transparent lacquer and a silver coating. The silver coating is preferably produced by the application of a silver lacquer forced against the coated reflecting surface with high air pressure so that the silver particles penetrate the translucent, colored coating, thus adding numerous sharp points of reflectance to the reflecting surface. All the other buttons are provided with a first coating of lacquer having the desired color, blue, green, etc., and on top thereof a silver coating.

The different buttons from red to clear are arranged at different distances from the light source 27. In order to obtain substantially the same visual effect with regard to the different buttons I provide the darker colored buttons, purple and green, nearest the light 27, and the buttons which have a lighter color, such as clear or yellow, or a color more readily visible, such as red, further away.

If during operation a button is pushed in, as shown in full line in Fig. 2, its reflecting surface 32 is exposed to the light of the source 27 and reflects such light outward through the end surface 26. All buttons which are in the "out" or "off" position, as shown by dash-dotted line in Fig. 2, are not exposed to the light of the source 27, such light being screened off by a member 37 attached to the back of the wall 17. The screen 37 may also constitute a support and guide for the push buttons, keeping them aligned and thus assuring smooth operation of the switch.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A push button indicating device for use with electric switches comprising, in combination, a supporting element, a row of push buttons car-

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ried by said element, each button comprising a member of light transmitting material and being provided with a surface disposed at an angle to the face of the button to form a prism, a light source adjacent said buttons for directing light toward the prisms when the buttons are pushed so that it is reflected toward the faces of the buttons, each of said buttons having different colors graduating from dark to light, the buttons having colors less readily visible being closer to the light source than those more readily visible so that the light transmitted by the prisms to the ends of the buttons is of substantially uniform intensity.

2. A push button indicating device for use with electric switches comprising, in combination, a supporting base, a row of push buttons carried by said element, each button comprising a solid member of light transmitting material and being provided with a surface disposed at an angle to the face of the button to form a prism, the prismatic surface thus formed being provided with intersecting sets of substantially parallel grooves forming light reflecting surfaces and a light source adjacent said buttons for directing light toward the prisms when the buttons are pushed so that it is reflected from the surfaces toward the faces of the buttons, each of said buttons having different colors to provide different visual effects when operating the different push buttons.

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