

Dec. 13, 1949

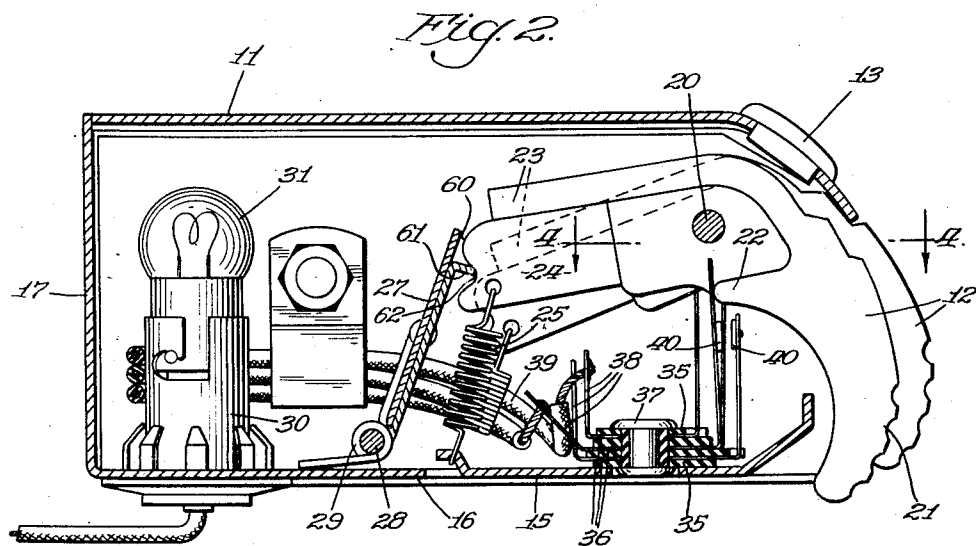
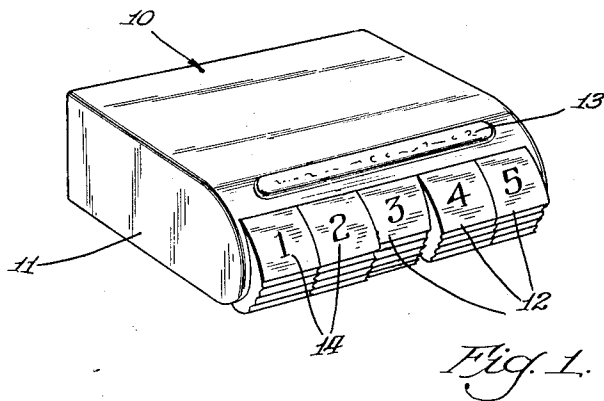
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2,491,168

PUSH BUTTON CONTROL HEAD

Filed April 12, 1947

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

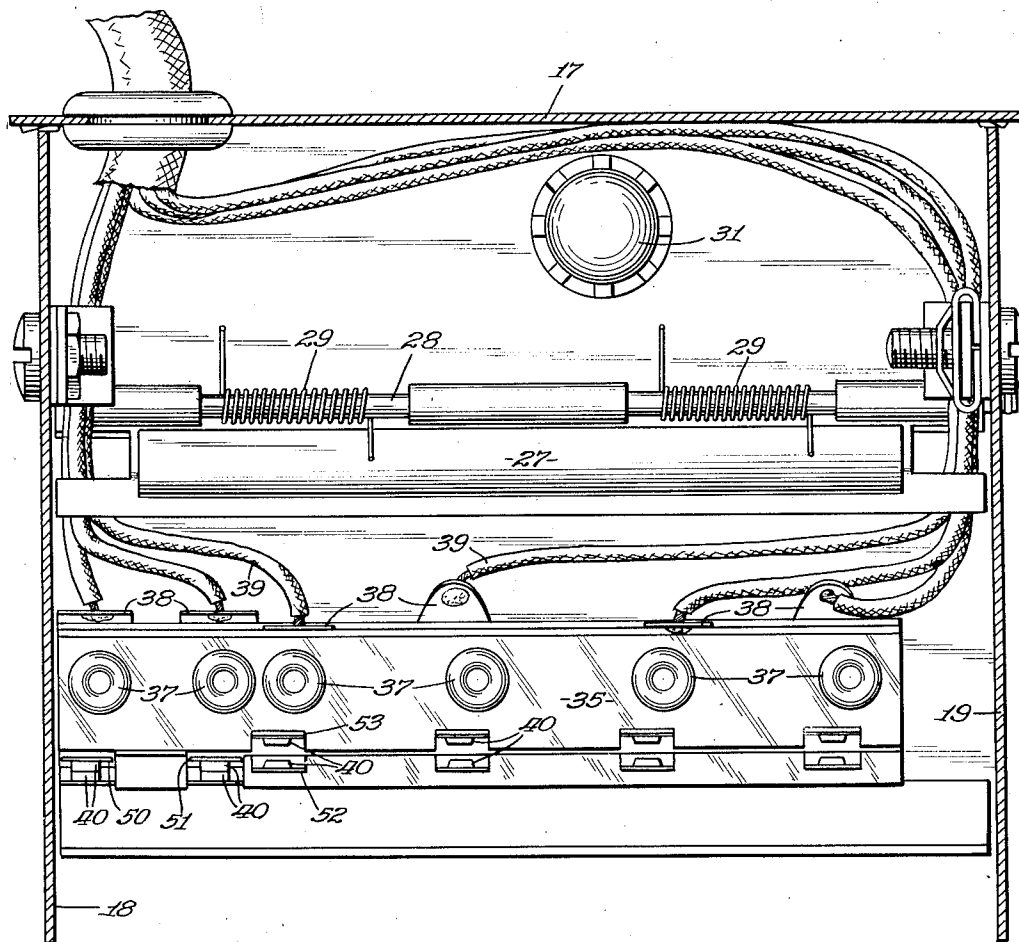


Fig. 3.

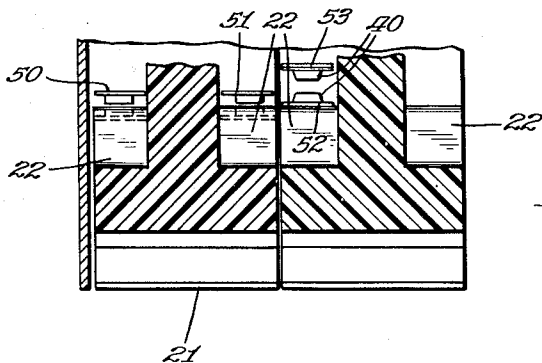


Fig. 4.

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PUSH-BUTTON CONTROL HEAD

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5 Claims. (Cl. 200—5)

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This invention relates generally to a remote control head and more particularly to an arrangement for illuminating the push buttons of a push button control head.

It is the usual practice in many applications to provide a control head which is remote from the particular piece of apparatus which is controlled thereby. Such control heads are used in connection with heating systems, radio sets and the like. In some instances the control head may be located in a position where it is either not desired that there be a large amount of illumination or it is not practical to have high illumination, and in such cases it is difficult to observe the position of the various controls on the control head and the setting thereof. Various lighting arrangements have been used on control heads to overcome this difficulty but these systems have been objectionable in many cases in that if sufficient illumination is provided for indicating the position and setting of the controls, the illumination is so great to be objectionable in the particular location. This is particularly true in connection with control heads used with heaters or radios installed in automobiles, as to permit good driving visibility it is necessary that illumination within the vehicle be as low as possible.

It is, therefore, an object of the present invention to provide a simple and effective illuminated push button control head.

It is a further object of this invention to provide a push button control head including a lighting arrangement which illuminates the push buttons so that the indicia thereon is visible.

It is a still further object of this invention to provide a push button control head having a source of light therein and means for conducting more light to a push button which is actuated than to the push buttons which are not actuated so that the setting of the push buttons is readily apparent.

A feature of this invention is the provision of a push button control head including a plurality of push buttons so arranged that light from a light source is transmitted thereby.

Another feature of this invention is the provision of a control head including push buttons made of light refractive material and so arranged that a button in actuated position is exposed to a light source to be illuminated thereby and the buttons which are not actuated are illuminated to a lesser extent.

A further feature of this invention is the provision of an illuminated push button control head

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including means for interlocking the push buttons so that actuation of one button releases the others and in which the interlocking means is arranged to shield the buttons not actuated from a light source in the control head so that these buttons will be illuminated to a less extent than a button which is actuated.

Further objects, features and advantages of the invention will be apparent from a consideration of the following specification taken in connection with the accompanying drawings in which:

Fig. 1 is a perspective view of the push button control head in accordance with the invention;

Fig. 2 is a cross-sectional view illustrating the operation of the control head;

Fig. 3 is a view looking down on the control head with the cover and push buttons removed; and

Fig. 4 is a detailed view along the lines 4—4 of Fig. 2.

In practicing my invention I provide a small control head suitable for installation in a vehicle for controlling a heater or radio installed therein. The control head includes a plurality of pivotally mounted push buttons having finger engaging portions, switch actuating portions and rearwardly extending portions for interlocking the various push buttons with respect to each other. Switch contacts are arranged to be actuated by the switch actuating portions and may be arranged so that the switch is either opened or closed by operation of the push buttons. The push buttons are made of light refractive material and a light bulb is provided within the control head so that light therefrom is transmitted by the push buttons. The push button interlocking means includes a pivoted baffle member which is effective to shield the push buttons when in their normal position from the direct rays of the light source but which allows a push button which is actuated to be exposed to the light rays so that the depressed button will be illuminated to a greater extent than the other push buttons.

Referring now to the drawings, in Fig. 1 there is illustrated a push button control head 10 which may be installed in a vehicle to control a heater or radio installed therein and which may be used generally in applications requiring a remote control head. The control head includes a housing 11, push buttons 12 and a name plate 13 which may indicate the equipment controlled by the control head or may be used for a trade name. The push buttons 12 are shown having numbers 14 placed thereon by any suitable means, it being

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obvious that various types of indicia can be provided, such as the call letters of a radio station, the temperatures at which a heating unit may be set, or other designations.

As shown in Figs. 2 and 3, the operating components of the control head are mounted on a chassis 15 including a base portion 16, back portion 17 and end portions 18 and 19. The housing 11 may be secured to the chassis in any suitable manner. Push buttons 12 are pivotally mounted on a rod 20 which is supported by the end portions 18 and 19. As shown in Figs. 2 and 4, the push buttons include a finger engaging portion 21, switch actuating portions 22 and a rearwardly extending portion 23. The portion of the push button adjacent the rod 20 is of reduced cross section forming a hollow space within which the switch contacts extend for movement by the switch actuating portions 22. For providing interlocking action between the push buttons, portions 24 are provided on each of the push buttons which may be integral with the remainder of the buttons or may be a separate member secured thereto. The portions 24 are biased in a downward position by springs 25 and include rear surfaces of such configuration to cooperate with pivoted baffle-like member 27 to provide an interlocking action of the push buttons. The member 27 is pivoted on a rod 28 which is supported by the end portions 18 and 19 similarly to rod 20. A pair of springs 29 are positioned about the rod 28 which have end portions bearing against the baffle-like member 27 and the base portion 16 of the chassis to hold the baffle against the curved rear surfaces of the push buttons. At the rear of the chassis between the member 27 and the back portion 17 a socket 30 is provided in the base member 16 of the chassis having a bulb 31 positioned therein for illuminating the control head.

Figs. 2, 3 and 4 disclose the switch contact structures and the manner in which the push buttons cooperate therewith. This structure is composed of a plurality of laminae 35 of insulating material having conducting members 36 positioned therebetween. These laminae are secured together by a plurality of rivets 37 to form a unitary assembly. The conducting members 36 have terminals 38 on the rear side thereof to which connection is made by conductors 39. The front portions of the contacting members are turned up as shown in Fig. 2 and carry contacts 40 thereon. As illustrated in the drawings, the contact carrying portions may be arranged so that the contacts are normally closed and are opened by the push buttons or so that the contacts are normally open and are closed by the push buttons. Also each push button is capable of operating two sets of contacts but it may be desirable in many applications that at least some of the buttons operate only one set of contacts. These various arrangements are illustrated in Figs. 3 and 4 wherein the contact carrying members 50 and 51 normally hold the contacts 40 associated therewith closed and are moved by the switch actuating portions 22 of the first push button to break the contacts. The contacts carried by contact carrying members 52 and 53 on the other hand are normally in open position with the member 52 being moved by the switch actuating portion 22 of the second push button to cause the contacts 40 of this switch to be closed. In the switch illustrated, the first button has associated with it two sets of contacts both of which are normally closed and which

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may be opened by actuation of the push button. Only one set of switch contacts is associated with each of the remaining push buttons and these are all positioned so that the contacts are normally opened and will be closed by actuation of the button. It is obvious from this disclosure that two sets of switch contacts may be associated with each button and the contacts may be so arranged so that one set is normally open and the other set normally closed. Actuation of the push button will then close the first set of contacts and open the second.

As previously stated, the push buttons include portions 24 which cooperate with a pivoted baffle-like member 27 to provide interlocking action of the push buttons. Specifically this action results from the coaction between the curved projection 60 and the recess 62 in the rear surface of the push button, and the right angle projection 61 of the member 27. As the finger engaging portion 21 of a push button is depressed the rear portion moves upward with the curved projection 60 engaging the projection 61 of the baffle causing the baffle to be tilted rearwardly. The projection 61 locks in the recess 62 in the back portion of the push button and prevents the spring 25 from restoring the push button to the normal position. The operation of one of the other buttons, however, will cause the baffle to be tilted rearwardly again thereby releasing any button which is in actuated position and allowing the spring 25 to move such button to its normal position.

In addition to providing interlocking action between the push buttons, the member 27 also has the additional function of shielding the push buttons when in their normal positions from the direct rays of the bulb 31. The push buttons 12 are constructed of a transparent material such as Lucite, Plexi-glas, etc., which has a high index of refraction. Hereafter in the specification and claims such materials will be referred to as light refractive material. Because of the optical properties of such material, any illumination reaching the rear portion 23 of the push button is conducted along the material of the push button to the finger engaging portion 12 thereof. Accordingly, when the buttons are in their normal position as shown by the second button in Fig. 2 (partly in dotted lines), the portion 23 thereof is shielded from the light by the member 27. Some light, of course, will be reflected from control head housing to the push buttons so that there will be limited illumination thereof. However, when the push buttons are depressed as illustrated by the first button in Fig. 2, the rear portion 23 is positioned above the member 27 so that light from the bulb 31 contacts the push button directly. This light will be transferred through the material of the push button to the portion thereof which is in view to illuminate this portion to a relatively high degree. Therefore, any push button which is depressed will appear much brighter than the push buttons which are not depressed to make it readily apparent to any observer as to the setting of the buttons on the control head. The name plate 13 may also be made of light refractive material so that light from the bulb 31 is transmitted thereby making any designation on the name plate intelligible even in total darkness.

It is apparent from the foregoing description that I have provided an improved illuminated push button control head which is of general application. Although a control head having five push buttons is illustrated, it is obvious that any

number of push buttons may be provided without departing from the invention. The lighting arrangement of the control head both illuminates the indicia on the push buttons and makes readily apparent the setting of the buttons by the intensity of the illumination thereof. The lighting arrangement is combined with the interlocking mechanism of the switches to provide a simple and relatively fool-proof structure which is of inexpensive construction.

Although I have described one embodiment which illustrates the invention, it is apparent that various changes and modifications can be made therein within the intended scope of the invention as defined by the appended claims.

I claim:

1. A push button control head comprising a housing, a plurality of switches within said housing, a plurality of push buttons made of light refractive material pivotally mounted on said housing and including switch actuating portions, each of said push buttons having a normal position and an actuated position, a light source within said housing, and means positioned between said light source and said push button and cooperating with said push buttons for holding a button which has been actuated in said actuated position and for releasing the same when an additional button is actuated, said means including a light shielding portion arranged so as to be more effective in preventing the passage of light from said source to the buttons which are in the normal position than to a button in actuated position, whereby a button in actuated position is illuminated more than the buttons which are in the normal position.

2. A push button control head comprising a plurality of switches, a plurality of pivotally mounted push buttons made of light refractive material and including switch actuating portions and curved rear portions, said push buttons having a normal position and an actuated position, a light source, and means associated with said rear portions of said push buttons for interlocking said buttons, said interlocking means including a pivoted baffle-like member having a projection adapted to engage the curved rear portion of said buttons to hold a button which is actuated in said actuated position and to be pivoted by the curved rear portion of a push button which is being actuated to release any push button which is being held thereby, said baffle-like member also being effective to shield said buttons from said light source when they are in said normal position so that an actuated button is illuminated more than said buttons which are in said normal position.

3. A push button control head comprising a housing, a plurality of switches within said housing, a plurality of push buttons made of light refractive material and including switch actuating portions and curved rear portions pivotally mounted on said housing, said push buttons having a normal position and an actuated position, a light source within said housing, and means positioned between said light source and said push buttons and associated with said rear portions of said push buttons for interlocking said buttons and for selectively transmitting

light thereto, said interlocking means including a baffle-like member pivotally supported on said housing and having a projection adapted to engage the curved rear portion of said buttons to hold a button which is actuated in actuated position and being adapted to be pivoted by the curved rear portion of a push button which is being actuated to release any push button which is being held thereby, said baffle-like member also being effective to shield said buttons from said light source when they are in said normal position so that an actuated button is illuminated more than said buttons which are in said normal position.

4. A push button control head comprising a plurality of switches, a plurality of pivotally mounted push buttons including switch actuating portions and curved rear portions, said push buttons having a normal position and an actuated position, and means associated with said rear portions of said push buttons for interlocking said buttons, said interlocking means including a pivoted baffle-like member having a projection adapted to engage the curved rear portion of said buttons to hold a button which is actuated in actuated position, said baffle-like member being moved by the curved rear portion of a push button which is being moved to said actuated position to release any push button which is being held thereby.

5. A push button control head comprising a plurality of switches, a plurality of pivotally mounted push buttons made of light refractive material and including switch actuating portions and curved rear portions, said push buttons having a normal position and an actuated position, a light source, and means associated with said rear portions of said push buttons for interlocking said buttons and for selectively transmitting light from said source thereto, said means including a pivoted baffle-like member having a projection adapted to engage the curved rear portion of said buttons to hold a button which is actuated in actuated position and to be moved by the curved rear portion of a push button which is being moved to said actuated position to release any push button which is being held thereby, said rear portions of said push buttons when in said normal position being below said baffle-like member so that they are shielded from said light source and being above said member when in said actuated position so that an actuated button is exposed to said light source and is illuminated more than the buttons which are in the normal position.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,823,319	Dickinson	Sept. 15, 1931
2,285,374	Dohsmann	June 2, 1942
2,331,590	Andres	Oct. 12, 1943