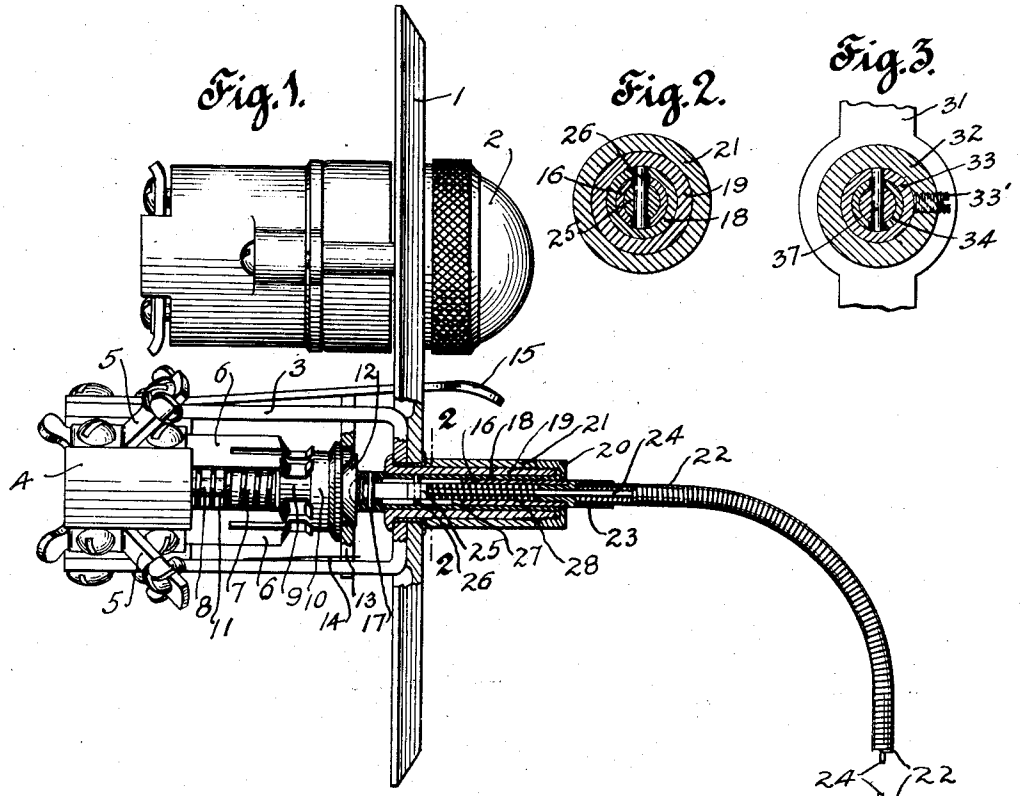
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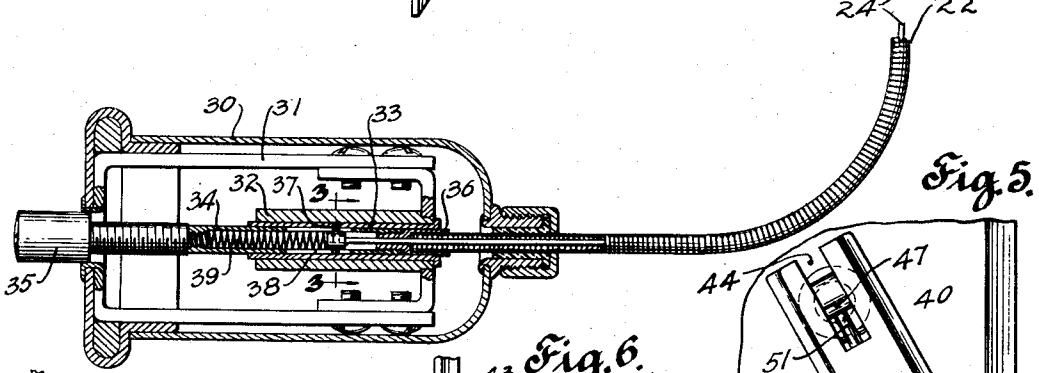
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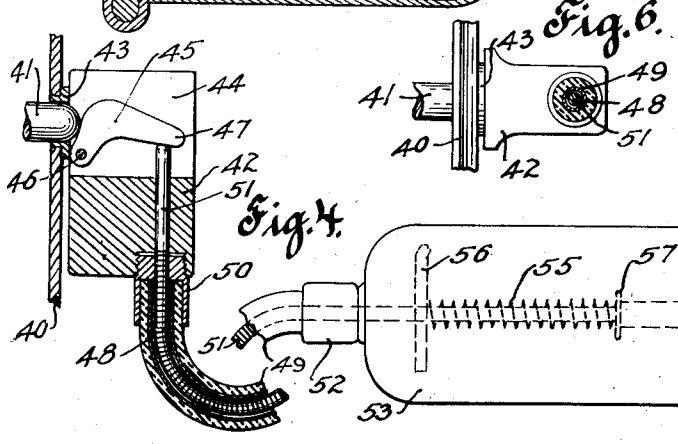
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HOSPITAL SIGNAL SWITCH

Filed May 6, 1925







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UNITED STATES PATENT OFFICE.

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HOSPITAL SIGNAL SWITCH.

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My invention relates to a switch, particularly though not exclusively adapted for use in a hospital signal system.

It is the general object of the invention to provide a simple, reliable, mechanical means for actuating a switch from a remote point. Other objects will be apparent as the specification proceeds.

Briefly stated, in the preferred form of the invention I may employ a switch mechanism which may be mounted on a wall plate usually placed above a patient's bed when the switch is employed in the hospital signal system. The switch mechanism is electrically connected to one or more devices such as a signal light or audible signal which when the switch is operated by the patient, will call the attention of a hospital attendant to a signal from the patient. The electrical connections to the switch are preferably made at or adjacent the wall plate and the switch is operated by mechanical means remote from the wall plate and preferably in the form of flexible members which may be actuated by a button or the like within easy reach of the patient's bed.

In the drawings which show for illustrative purposes only, preferred forms of the invention:

Fig. 1 is a side view in partial section of a switch embodying features of the invention;

Fig. 2 is a sectional view taken substantially in the plane of the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken in the plane of the line 3—3 of Fig. 1;

Fig. 4 is a fragmentary sectional view illustrating a modification;

Fig. 5 is a front fragmentary view in elevation of parts shown in Fig. 4;

Fig. 6 is a fragmentary view of the under side of parts shown in Fig. 4.

In said drawings, 1 designates a wall plate or other support which may be secured to the wall at a point above a patient's bed when the device is embodied in a hospital signal device. 2 indicates a light which is put in circuit and becomes lighted when the switch mechanism to be later described is actuated by the patient. 3 indicates a frame carrying an insulating block 4 which in turn carries a plurality of terminals such as 5—5 for making electrical connections from the switch to the signal light 2 and to other electrically operated devices such as a signal light, buzzer or the like, not shown. The block 4 carries a plurality of contact brushes 6—6 which are electrically connected to the terminals 5—5.

A plunger 7 may be guided in the block 4 by means of a tail or stem 8 and carries an insulating portion 9 of fibre or the like upon which the contact brushes 6—6 may rest when the switch is in open circuit position. On the switch plunger 7, forwardly of the insulating portion 9, is a conducting ring 10 which when the plunger is moved inwardly toward closed circuit position and against the tension of the spring 11 closes the circuits through the brushes to the source of E. M. F., signal devices, etc. If desired, under certain conditions the spring 11 may also act as a current carrier but since the specific electrical connections to the various signals form no part of the present invention, no detailed description thereof need be given.

The plunger may have an inclined surface thereon such as the cone cam 12 which may pass through an aperture in a latch plate 13 which is suitably guided in the frame 3 as will be clear from Fig. 1. A spring 14 constantly urges the latch plate 13 in one direction so that when the plunger is moved inwardly so as to cause the switch to close the circuit or circuits, the cone 12 will pass through the aperture in the plate 13 and the spring 14 will then move the plate so as to latch behind the cone 12 and thus hold the plunger in the inward or closed circuit position. When the plunger is thus latched it may be moved inwardly to a greater extent when desired but cannot return to open circuit position until the cone 12 is unlatched from the plate 13. For the purpose of permitting the circuit to again be broken I may provide a member such as the latch release arm 15 for engaging the plate 13 to depress the same to disengage the shoulder from behind the cone cam 12 to permit the spring 11 to again move the switch plunger to the open circuit position as shown in Fig. 1.

In the form of the invention shown in Fig. 1, the plunger 7 has secured thereto a

sleeve or tube 16 which may be held to the plunger as by means of a pin connection 17. The sleeve 16 is slotted and is slidably housed in a second tube or sleeve 18 which is secured to the switch frame or plate 1 by any suitable means. In the form shown the tube 18 is beaded over the frame 3 and a nut 20 is threaded on the opposite end so as to hold a flange on the sleeve 16 as will be clear from Fig. 1. A ferrule or thimble 21 may be interposed between the nut 20 and the face plate.

Now, in order to operate the movable switch member I may employ a flexible member including inner and outer concentric members. One of these flexible members, in this case the outer one 22, is connected to the sleeve 16 by the nut 23 threaded on the rear end of said sleeve. Now with the outer member 22 connected thus to the movable switch member the inner or other flexible member 24 must be held stationary and to accomplish this result I may form an eye or head 25 on the inner end of the member 24 and insert a pin 26 through this eye and into the stationary sleeve 18, which is fixedly secured to the switch frame and wall plate 1 as previously described. As shown particularly in Figs. 1 and 2, the sleeve 16 is slotted at 27 so as to accommodate the pin 26 to permit a limited sliding of the sleeve 16. A spring 28 may be interposed between a stationary part such as the pin 26 and the nut 23 carried by the sleeve 16 and this spring constantly urges the sleeve 16 into such a position as to draw the movable switch plunger to the open circuit position.

The opposite ends of the flexible cable or operating means may be connected to any suitable type of manually operable device such as a push button. In the form disclosed I employ a casing 30 in which is secured a frame 31 carrying a sleeve or thimble 32 which in turn carries a second sleeve 33, these sleeves being fixedly mounted relatively to the frame 31 by means of the set screw 33′ and pin 37 (Fig. 3). Within the sleeve 33 there may be a tube 34 mounted for sliding movement. One end of this tube may carry the operating button 35 while the opposite end of the tube is connected to the end of the outer flexible cable 22 as by means of a nut 36 screwed in the end sleeve. The inner flexible member 24 may have an eye formed thereon which receives the pin 37 extending into the sleeve 33 which thus holds the inner flexible member 24 rigid with relation to the frame 31 and casing 30. The sleeve 34 is slotted at 38 so as to accommodate the pin 37 and permit a limited sliding movement. A spring 39 may be interposed between a stationary part such as the eye on the end of the flexible member 24 and the opposite end of the tube where it carries the button 35.

It will now be clear that with the inner flexible member 24 rigidly held at one end in the frame carrying the switch and the opposite end in the frame on the button casing, that if the button 35 be depressed the outer flexible cable member 22 will be guided by and may slide over the inner member 24 and movement of the button 35 will thus compress the outer member 22 and the movement of the button 35 will thus be communicated to the movable switch member so as to move the same to closed circuit position, in which position it may be latched by means previously described. When the switch is thus closed it remains closed and the signal on until released by means of the finger piece 15.

By employing the means herein disclosed it will be obvious that there need be no electrical connections or conductors in the flexible cable or button casing and any damage to the button casing or to the operating member will not affect the electrical connections to the switch. Obviously the flexible operating member may be covered by rubber tubing or the like for sanitary reasons.

In the form of the invention shown in Figs. 4, 5, and 6 the wall plate 40 is apertured to receive the stem 41 which in turn may be part of or be connected to a movable switch member such as the plunger 7 described in connection with Fig. 1. 42 indicates a housing block which may be secured to an eyelet 43 beaded over the frame or plate 40 and which acts as a swivel or hollow-swivel connection to permit relative rotary movement between the block 42 and the plate 40. As will be clear, the stem 41 extends through the eyelet 43 and is consequently always in the same concentric relation with the eyelet and the block. The block 42 may be recessed or slotted as at 44 and in this slot may be mounted a cam as shown at 45 in Fig. 4. This cam may be pivoted at 46 in the slot and one side is in position to engage the stem 41 to depress the same and thus close the circuit when the free end 47 of the cam is raised.

As a means for raising the cam 45 I may also employ a flexible operating means similar to that previously described. In the present instance, however, it is the inner flexible member which I employ for directly operating the cam. In accordance with this form of the invention I may employ an outer flexible tube 48 which may be covered in a rubber tube 49 for sanitary reasons. This flexible tube 48 may be rigidly held in a bushing or nut 50 secured to the block 42. The inner flexible member 51 is slidable through an appropriate aperture in the nut 50 and in the block, which apertures are positioned so as to be in the path of the cam 45 so that the free end of the flexible member 51 may engage beneath the cam 45 to

depress the switch stem 41 as will be clear from Fig. 4. The opposite end of the flexible operating means may be connected to a button or other manually operable device. In the form shown the outer flexible cables 48—49 are held in a bushing or nut 52 which may be secured to a casing 53. The inner flexible member which is, of course, slidable within the outer concentric member is slidable through the nut 52 and extends into the casing 53 and is attached to an operating button or the like 54. If desired, a spring 55 may be interposed between a stationary part 56 of the casing and an abutment 57 on the member 51 for retracting the inner operating member. It will be obvious that with the outer flexible tube held rigidly at opposite ends, depression of the button 54 will cause the inner member 51 to slide and raise the cam 45 to depress the switch stem 41 for closing the circuit. The swivel mounting of the block 42 on the plate 40 is advantageous in that it permits a movement angularly of the plate 40 so that the switch may be operated from substantially any angle without unduly bending the flexible operating means.

While the invention has been described in some detail and in connection with a hospital signal system, I do not wish to be confined to the forms shown nor to the specific application of the device herein disclosed, since many changes may be made within the scope of the invention as defined in the appended claims.

I claim:

1. In a hospital signal switch, a wall plate, electric switch mechanism at the inner side of said wall plate and means for operating said switch mechanism from a distance including a member having a hollow-swivel connection with said wall plate, a second member adapted to extend through said hollow-swivel connection and movable for operating said switch, and means for pressing said second member inwardly through said hollow-swivel connection including a flexible two-part operating cable extending into said first mentioned member from the side and a push button at the free end of said cable.

2. In a hospital signal switch, a wall plate, electric switch mechanism at the inner side of said wall plate, and means for operating said switch mechanism from a distance including a flexible two-part operating cable having a push button at one end, a member to which said cable is connected at the other end, a hollow-swivel connection between said member and said wall plate to permit said member to turn in accordance with the direction in which said cable extends, and means operable through said hollow swivel connection for actuating the switch mechanism in accordance with the actuation of said button.

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