March 22, 1955 J. S. WHITE 2,704,814

CIRCUIT MAKERS AND BREAKERS FOR SIGNAL OR ALARM CIRCUITS

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FIG. 1.

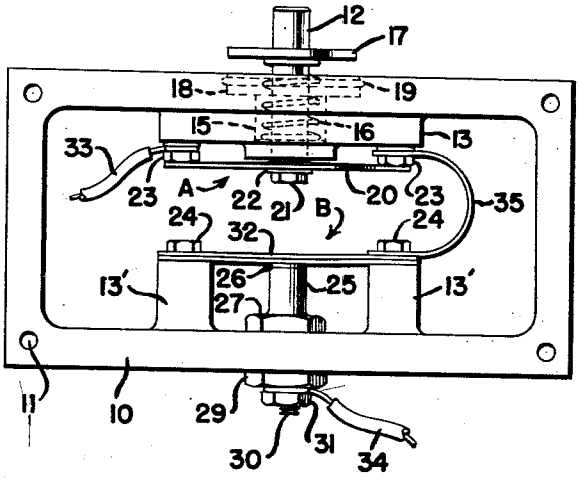


FIG. 3.

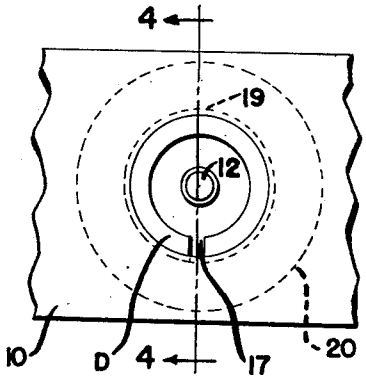


FIG. 2.

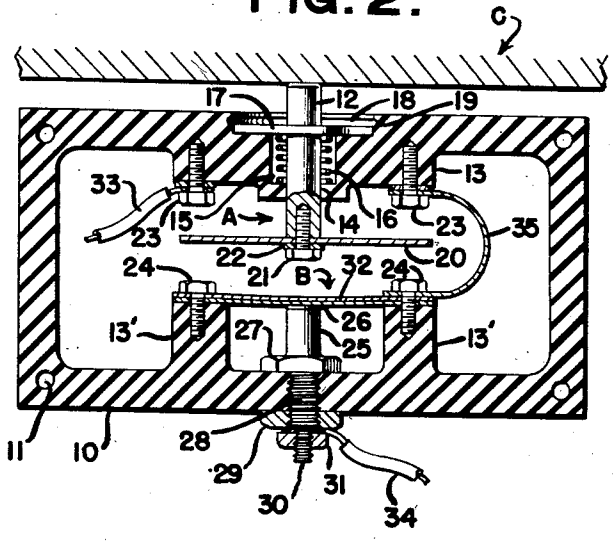
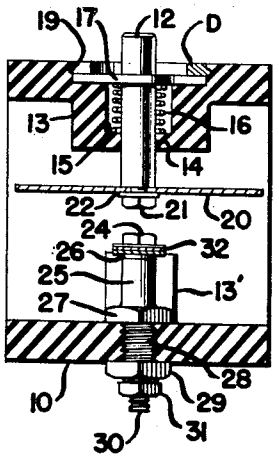


FIG. 4.



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CIRCUIT MAKERS AND BREAKERS FOR SIGNAL OR ALARM CIRCUITS

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2 Claims. (Cl. 307—132)

This invention relates to circuit makers and breakers particularly of a type for signal or alarm circuits.

A primary object of my invention is to provide combined switch mechanism which is responsive to complete a circuit responsive to conditions prevailing at the location of the mechanism and to interrupt the circuit intermittently at said location whereby the curent is controlled so as to flow in intermittent impulses when the prevailing conditions are such as to effect the closing of the circuit for transmitting such impulses.

Another object of my invention is to provide a control switch which is adapted for operation by thermal conditions or under the influence of physical conditions rendering the mechanism operative to transmit such impulses due to excessive temperatures for operating fire alarm or signal systems or whereby the mechanism may be used in connection with burglar alarm systems.

Another object of my invention is to provide such a combined signal switch mechanism which is inexpensive to construct and simple and efficient in its operation.

Further objects and details of my invention will appear in the following description supplemented by the accompanying drawings forming a part of this specification.

Referring to the drawings:

Fig. 1 is a side elevation view of a combined signal switch mechanism in accordance with my invention.

Fig. 2 is a vertical sectional view thereof.

Fig. 3 is a fragmentary plan view thereof.

Fig. 4 is a vertical sectional view thereof taken substantially on the line 4—4 of Fig. 3.

Referring to the drawings, in general the switch mechanism in accordance with my invention includes a rectangular casing **10** of insulating material provided with transverse bores **11** for receiving bolts to hold front and back cover plates (not shown) thereon when desired. This casing houses a control switch A with an upwardly extending operating rod **12** and an intermittent circuit interrupter B.

As diagrammatically shown in Fig. 2 my switch mechanism is particularly adapted for use in conjunction with a movable object C such as an object which may rest thereon when the mechanism is mounted in a floor, or in conjunction with a door, window or the like so that the operating rod **12** is depressed to maintain the circuit controlled by the mechanism open.

In Figures 3 and 4 my switch mechanism is shown in use with a fusible split ring D which maintains the control switch A open wherein it is applicable in a fire alarm system. Thus it will be seen that the mechanism is adaptable for various uses though primarily intended for burglar or fire alarm systems.

In a preferred construction the casing **10** is formed with mounting bases **13** and **13'** for the respective control switch A and circuit interrupter B. Casing **10** has a bore hole **14** in its mounting base **13** through which operating rod **12** extends and a well **15** concentric therewith provides a housing for a compression spring **16** which engages a disk-like collar **17** to urge the rod to its upper circuit closing position as shown in Fig. 1. Collar **17** is housed in a concentric opening **18** surrounding rod **12** in the upper portion of casing **10** when the rod is depressed to circuit opening position as shown in Figs. 2, 3 and 4 and this opening is provided with a groove **19** adjacent to the upper surface of casing **10** into which the fusible split ring D may be inserted for retaining the rod in its open circuit position when the mechanism

is used in conjunction with a fire alarm system or the like.

The lower end of rod **12** carries a flexible metallic disk **20**, a set screw **21** and lock washer **22** holding the same in place so that it will be carried to reciprocate between the circuit opening and closing positions of rod **12**. This disk **20** provides the movable contact element of the control switch A which is reciprocable to engage and disengage from a pair of fixed contacts **23** comprising set screws which also function as binding posts for conductor leads. When the operating rod **12** is in circuit closed position spring **16** urges it upward so that flexible disk **20** is brought into a tight engagement with the end surfaces of contacts **23**, the flexibility thereof insuring good current conducting engagements with both of them even though conductor leads of slightly different diameters or thicknesses may be employed.

While the circuit interrupter B may be of any desired type my preferred construction comprises a bimetallic thermal element **32** which is normally bowed downwardly and secured in place on mounting bases **13'** of casing **10** by set screws **24** which also provide binding posts for lead conductors. A contact post **25** is positioned in a midpoint between the ends of bimetallic strip **32** and has a silver plate **26** on its upper end which electrically engages the bimetallic thermal element under normal temperature conditions. Contact post **25** has a collar **27** illustrated as hexagonal in shape at its base which engages the lower wall of casing **10**. A threaded extension **28** extends from collar **27** through a similarly threaded opening through the casing **10** for receiving it and a nut **29** thereon secures the contact post **28** in place. It is also provided with a reduced threaded extension **30** carrying a nut **31** which provides a lead conductor binding post.

It will be seen that set screws **23** and **24** and nut **31** provide binding posts by means of which the control switch A and circuit interrupter B may be connected as desired in a signal or alarm circuit of any well known type and they are adapted for operation in either direct or alternating circuits. While no signal system or alarm circuit is illustrated conductor leads **33** and **34** for the control of such systems by my control mechanism are illustrated as desirably connected with one of the binding post set screws **23** and under the binding post nut **31** to contact post **25**. The control switch A and circuit interrupter B are connected in series in such circuit by a conductor **35** extending from the other set screw binding post **23** to one of the set screw binding posts **24**.

In such a circuit it is clear that when control switch A is closed under changed conditions—removal of object C, or fusing of ring D or the like—current passing through the control switch A and interrupter B will heat interrupter strip **32** and cause it to bend to disengage its contact with post **25**, thus intermittently interrupting the current flow in the signal or alarm circuit as long as the circuit is under the influence thereof.

It will be noted that the collar **17** normally resting on the bottom of opening **18** closes the well **15** in which the spring **16** is disposed, thus isolating the spring with respect to the outside of the casing **10** to prevent the accumulation of foreign matter in the well. This is of importance when the mechanism is installed in the floor where dust and dirt settles by gravity and in the act of sweeping foreign matter may be moved over the casing **10**, some of it falling into the opening **18**. The normal engagement of the collar **17** upon the bottom of opening **18** also limits the extent of movement of the rod **12** inwardly of the casing **10**, so that the spring **16** cannot be compressed to the extent where the convolutions of the spring touch one another and which might otherwise cause the spring to become permanently set in a fully compressed condition, especially if subjected to considerable heat. The collar **17** also serves to somewhat insulate the spring from gas of high temperature, such as would result from a fire, in the zone of the signal switch mechanism. The arrangement is such that a fused ring D may be replaced by a new one without gaining access to the main compartment of the casing **10**.

I claim:

1. A signal switch mechanism including a rectangular

casing of insulating material, mounting bases extending inwardly from walls thereof, said casing having an opening therethrough between the ends of one of said mountings and a concentric well in the outer portion thereof terminating at the outer wall with a further enlarged concentric recess having a groove in its circular wall adjacent to the surface of the casing wall, a fusible split ring having its peripheral edges engaged in said groove, a reciprocable rod extending through said opening having a collar thereon adapted to be seated in said enlarged concentric recess and to be retained in its seated position by the fusible split ring engaging the groove in the recess above the collar, a compression spring in said concentric well for moving the rod outward upon the fusing or removal of the split ring from the groove, a flexible metallic diaphragm carried by the inner end of said movable rod, and set screws in said mounting base adjacent to the ends thereof at opposite sides of said reciprocable rod providing lead terminal binding posts and the heads thereof serving as contact members adapted to be engaged by the flexible disk on said reciprocable rod when the rod is forced outwardly by said compression spring.

2. A signal switch mechanism including a rectangular casing of insulating material, mounting bases extending inwardly from walls thereof, said casing having an opening therethrough between the ends of one of said mountings and a concentric well in the outer portion thereof terminating at the outer wall with a further enlarged concentric recess having a groove in its circular wall adjacent to the surface of the casing wall, a fusible split ring having its peripheral edges engaged in said groove, a reciprocable rod extending through said opening having a collar thereon adapted to be seated in said enlarged concentric recess and to be retained in its seated position by the fusible split ring engaging the groove in the recess above the collar, a compression spring in said concentric

well for moving the rod outward upon the fusing or removal of the split ring from the groove, a flexible metallic diaphragm carried by the inner end of said movable rod, set screws in said mounting base adjacent to the ends thereof at opposite sides of said reciprocable rod providing lead terminal binding posts and the heads thereof serving as contact members adapted to be engaged by the flexible disk on said reciprocable rod when the rod is forced outwardly by said compression spring, a bimetallic strip secured at its ends to a remaining pair of said mounting bases projecting from a wall of the casing by means of set screws which also function as conductor terminal binding posts, a contact post threadedly caried by the wall of the casing between said mounting bases and extending inwardly and outwardly of the casing, a silver surface or plate on the inner end of said post against which said bimetallic strip lies in electrical contact engagement when said control switch circuit closing diaphragm is out of engagement with said contact members thereof, and a lead terminal binding post on the outer end of said contact post.

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