Dec. 13, 1966 G. SIKLOS 3,292,123

PERMANENT MAGNET OPERABLE REED SWITCH

Filed May 13, 1965

Fig. 1.

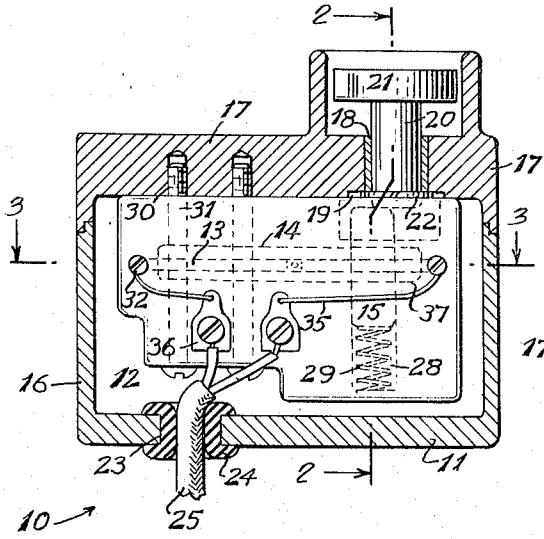


Fig. 2.

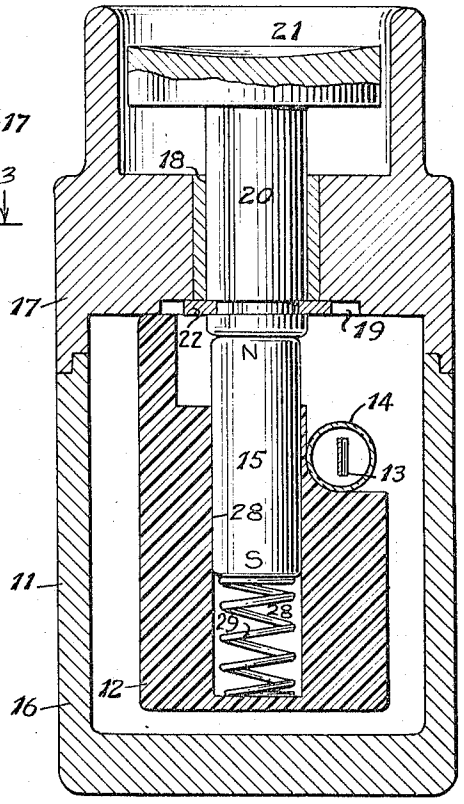
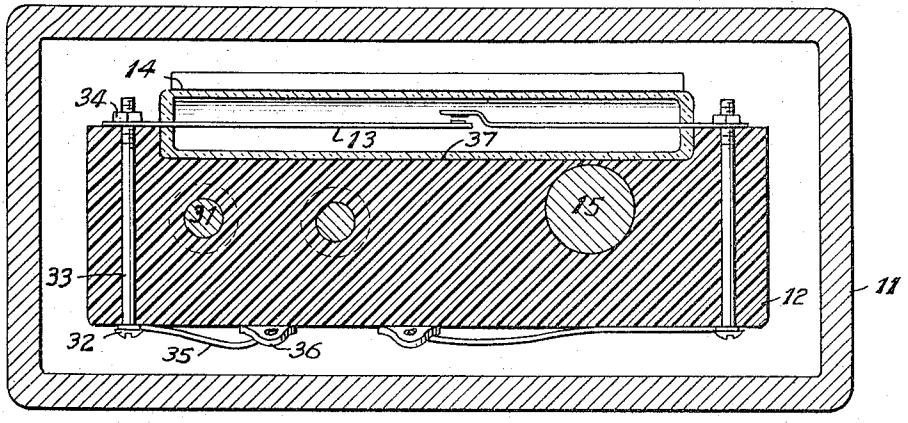


Fig. 3.



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PERMANENT MAGNET OPERABLE REED SWITCH

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My invention relates to switches and more specifically to reed switches with magnetic controls.

At present reed switches with magnetic controls have either required the use of shunts to channel or guide the magnetic flux or lines of force away from the reeds, or have used movable shields to protect the reeds from the lines of force when the switch is in an inoperable or open state.

As the use of shunts and shields add materially to the size and cost of such switches, it is therefore a prime purpose of the present invention to simplify such switches by dispensing with the requirement of any shunt and/or shield.

An additional purpose of the invention is to form an inexpensive simple magnetic reed switch with a minimum of elements.

I accomplish these and other objects by positioning my magnet, at all times away from the contacting ends of the reeds, and when the switch is in a non-functioning condition (open state) with equal parts at each side of a reed and when the switch is in use (closed state) with one of its end faces adjacent a reed.

For further comprehension of the invention and of the objects and advantages thereof, reference will be had to the following description, the accompanying drawings and to the appended claims in which the various novel features of the invention are more particularly set forth.

FIG. 1 is an elevational view, with the outer casing in section showing a block holding a reed switch, a magnet positioned to function therewith and a control button,

FIG. 2 is an enlarged sectional view along the line 2—2 of FIG. 1 and

FIG. 3 is an enlarged sectional view along the line 3—3 of FIG. 1.

In the drawing and in the specification, in which like numerals indicate similar elements, my magnetic reed switch **10** is comprised of an outer casing **11**, an inner block **12**, a reed switch **13** enclosed in a glass or plastic tube **14**, a magnet **15** which is positioned substantially normal to the reed switch **13**.

The outer casing **11** is comprised of separable parts **16** and **17** secured together in any convenient manner, with one of the parts having a hole **18** therethrough terminating at its inner end in a seat **19**. A shaft **20** which rests in the hole is provided with a button head **21** at its outer end above the outer casing and a ring or flange **22** in the vicinity of its inner end. The ring **22** is adapted to rest in seat **19** and retain the shaft in the hole, and together with the button to limit the possible travel of the shaft and of the magnet.

It should be noted here that when the ring **22** rests in seat **19**, the under surface of the button head **21** extends above the outer surface of the outer casing **17** a distance equal to one half of the length of the magnet **15**, thus limiting movement of the button and shaft to half the magnet's length. In addition it also is important that the lower face of the shaft **20** be positioned one half the magnet's length above a reed when the ring **22** rests in seat **19**. By so designing the device, the magnet normally rests when non-functioning with its median point or lateral axis even with a reed and when functioning with one of its ends or poles adjacent or even with a reed.

Although I have limited the travel of the shaft downward by the under surface of the outer casing, it should be noted that the button head could be dispensed with and a stud or other device substituted in its place to limit the shaft's travel. In fact no substitute is actually needed as the outer casing itself would limit a person's ability to press the shaft below the casing.

The casing **11** is also provided with a hole **23** and an insulating ring **24** through which electric cable **25** is drawn. The inner block **12** is provided with a well **28**, co-axial with the hole **18**, into which the shaft and its ring can be advanced, and in which magnet bar **15** rests on coiled spring **29**. The coiled spring **29** continuously holds the magnet against the shaft end so that the magnet normally rests astride a reed, that is with the lateral axis of the magnet in a plane with the longitudinal axis of a reed, but when the button **21** is pressed, the magnet is moved so that its pole or end face is adjacent a reed.

Holes **30** in the back and cover are provided to permit assembly screws **31** to secure the block to the inside of the outer casing. Screws **32** which extend through the block in holes **33**, are secured, at one end, to the terminal ends of the reed switch **13** by nuts **34** and at the other end to electric leads **35** which are secured by clips **36** to the electric cable **25**.

The reed switch tube **14** rests in seat **37** in the block **12**, with its exterior extending reed ends held by nuts **34** to screws **32** so as to connect the switch to its circuit. The reed switch **13** with its tube **14** is the common standard reed switch. It could however be any pair of opposingly positioned reeds having a common contactable end. It must be noted that the magnet is positioned at a distance from the inner or contacting reed ends but adjacent one reed. This is essential to prevent equally magnetizing of both reeds which would prevent their contacting. In other words the magnet must be positioned as far removed from one of the reeds and as close to the other as possible in order that only one reed becomes magnetized.

It should be understood that while I have illustrated and described only one embodiment of my invention, I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in any of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. In a reed switch, a magnet and a pair of elongated reeds having overlapping ends, the magnet being positioned adjacent one of the reeds and removed from the other reed and being movable from a position of rest, which position is with its longitudinal axis normal to the longitudinal axis of the reeds, and its lateral axis coincident with the projection of the longitudinal axis of the adjacent reed and to a functioning position in which a pole of the magnet rests coincident with the projection of the longitudinal axis of the adjacent reed whereby the reeds become magnetized and their overlapping ends contact one another when the magnet is moved to a functioning position.

2. In a reed switch a magnet said magnet being capable of being moved along its longitudinal axis, and a pair of reeds, the reeds positioned normal to the magnet and the magnet positioned away from one reed and adjacent the other reed and the magnet when in a non-functioning state positioned with its lateral axis coincident with the longitudinal axis of the adjacent reed and when in a functioning state with one of its poles coincident with the longitudinal axis of the adjacent reed whereby the adjacent reed becomes magnetized when the magnet is moved to a position in which one of its poles is coincident with the longitudinal axis of the said adjacent reed.

3. A reed switch as defined in claim 2 and having in addition a coiled spring, said spring when not compressed urging the magnet to a position midway between the reeds.

4. A magnet switch being comprised of a frame, a pair of co-actable reeds and a magnet, said frame supporting the reeds and magnet, said reeds positioned with an end of one reed partially overlapping an end of the other reed and said ends separated therefrom when not in a magnetized state, and the longitudinal axis of one of the said reeds normal to the longitudinal axis of the magnet, and the magnet adjacent said normal reed and away from the other reed, and when the magnet is in a nonfunctioning state, said magnet is positioned with its lateral axis coincident with the longitudinal axis of the normal reed and when in a functioning state said magnet is positioned with one of its poles in the longitudinal axis of the normal reed, whereby lines of force only pass from the magnet to the reeds when the magnet is in a functioning position.

5. A magnetic switch as defined in claim 4 and having in addition a coiled spring, said spring supported by the frame and capable of functioning against said magnet to retain it in its said nonfunction position.

6. A magnetic reed switch as defined in claim 4 and having a coiled spring and a means for motivating said magnet against the force of the spring, said spring supported by the frame and capable of functioning against said magnet to normally retain it in a position of rest substantially centered with the reed and said motivating means having a shaft slideable secured in the frame and capable of being moved so that one of its ends rests half the magnet's length away from one of the reeds.

7. A reed switch comprised of a pair of reeds, a magnet, a movement control means for said magnet and a framework housing said reeds, magnet and part of the movement control means and said framework also defining a well,

one of said reeds being in contactable relationship to the other,

said magnet resting in the well and positioned adjacent a reed, but removed from the other reed and the longitudinal axis of the magnet being normal to the longitudinal axis of the one reed,

and said movement control means having a shaft, a stop means and a spring, said shaft extending through the framework and aligned with and abutting one end of said magnet and said spring seated in the well and abutting the other end of said magnet and urging it and the shaft outwardly from the well, and

said movement control means having a pair of stops, one of which is positioned on the shaft at its outer end and the other in the vicinity of its magnet

abutting end and said two stops being a distance apart such as to limit the travel of the shaft to one half the length of the magnet and the stop in the vicinity of the magnet abutting end being so located as to cause the magnet to rest when under normal spring pressure with its lateral axis in a plane with the longitudinal axis of the one reed,

whereby the magnet normally exerts no magnetic force on the reeds but when the shaft is moved the limit of its travel one pole of the magnet is moved to the longitudinal axis of one reed and that reed becomes magnetized.

8. In a reed switch, a magnet, a motivating means therefore and a pair of reeds, said reed ends being in contactable position, said magnet being positioned substantially normal to one reed and adjacent one end of the said one reed, and said magnet normally resting with its lateral axis coincident with the longitudinal axis of the said one reed and said motivating means being capable of moving said magnet from its normal position of rest to a position where one of its poles is coincident with said one reed and stop means limiting said moving means to a travel of one half the length of the magnet whereby said magnet can be positioned to magnetize said one reed and move said one reed into contact with said other reed.

9. In a reed switch, a bar magnet, a coiled spring and a pair of stop means and a reed, said coiled spring positioned against the magnet to cause it to rest against said one of the stop means and said other stop means positioned in relationship to the one stop means and the length of the magnet as to limit the possible travel of the magnet to a distance of one half the length of the magnet whereby said magnet rests in one position astraddle said reed and perpendicular to the axis of said one reed.

10. In a reed switch as defined in claim 9, and in addition a pair of reeds, said reeds having contactable ends and ends removed from each other, and said magnet resting when in a functioning position, with one of its poles coincident with the longitudinal axis of a noncontactable reed end.

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