March 23, 1948. R. B. BRODE 2,438,383

UNSHORTING SWITCH

Filed Sept. 4, 1943

FIG. 1.

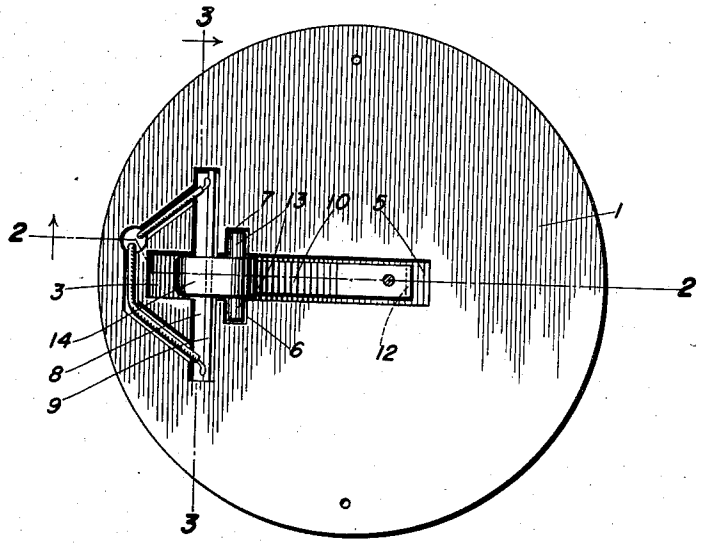


FIG. 2.

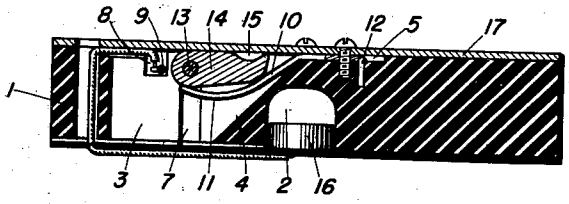


FIG. 4.

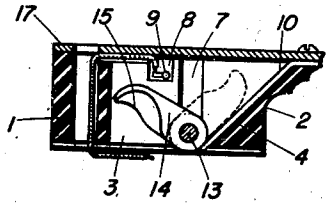


FIG. 3.

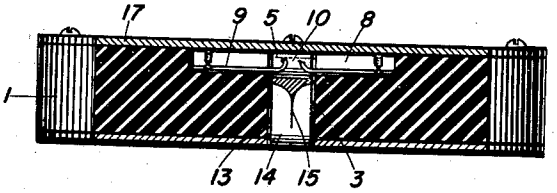
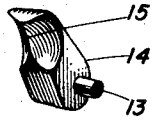


FIG. 5.



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UNSHORTING SWITCH

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Application September 4, 1943, Serial No. 501,305

6 Claims. (Cl. 200—80)

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This invention relates to an unshorting switch adapted for use in the control circuit of a radio proximity fuse of a projectile. One of the more important objects of the invention is to provide a device of this character which will require both centrifugal force and the forces of set-back for its proper operation.

Another object of the invention is to provide an unshorting switch which is simple in construction and which will be positive in operation in a rotating projectile upon discharge from the muzzle of a gun.

A further object of the invention is to provide a device of this character which will be small in size and which may be readily adapted for use with a radio proximity fuse control circuit in a rotating projectile.

Further objects of the invention, not mentioned hereinbefore, will become apparent during the course of the following description.

In the drawings:

Figure 1 is a top plan view of the device, the unshorting element being shown in operative position,

Figure 2 is a vertical sectional view taken at 2—2 of Figure 1,

Figure 3 is a vertical sectional view taken at 3—3 of Figure 1,

Figure 4 is a vertical sectional view showing the unshorting element, in full lines, in its operative position, the element being shown in dotted lines in its position after rearward movement by the forces of set-back, and

Figure 5 is a perspective view of the unshorting element.

Referring now more particularly to the drawings, the numeral 1 indicates generally the body of my improved unshorting switch. The body 1 is formed of Bakelite, rubber or other suitable material and is circular and of small thickness so that it may be readily mounted within the projectile can of a radio proximity fuze. Formed in the under surface of the body 1 is a recess 2 for receiving a squib.

Formed in the body 1 is a substantially radially extending recess 3. The recess, as will be seen in Figure 2, extends throughout the thickness of the body for a distance of substantially one-third of its length, said recess being provided with an inclined wall 4 which communicates at its upper end with a shallow portion 5. Communicating with the recess 3 at each side thereof and near its midportion are opposed tracks 6 and 7, the purpose of which will be set forth in more detail hereinafter. Also communicating with the recess

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and disposed near the tracks 6 and 7 is a groove 8 in which is mounted an unshorting wire 9. The unshorting wire normally extends throughout the length of the groove and across the recess near its upper edge. The opposite ends of the unshorting wire are connected with the terminals of a squib 16, which is mounted in the recess 2, by suitable wiring.

Mounted in the shallow portion of the recess 5 is a spring 10 which includes an upwardly bowed portion 11 which is normally disposed above the inclined wall 4. The spring 10 is provided at its inner end portion with an anchoring tongue 12 which is contained in a suitable recess in the upper face of the body. A suitable anchoring stud may be employed for locking the spring against displacement.

Movable vertically in the recess 3 and having corresponding opposite end portions slidable in the tracks 6 and 7 is a mounting pin 13, and rockably mounted on the pin is an unshorting element 14 which is formed with a shearing edge 15. As will be seen clearly in Figure 2, the element 14 is normally supported in inoperative position by the bowed portion 11 of the spring 10.

In operation, the element 14 is, when the projectile in which the device is mounted is accelerated, movable initially from the position shown in Figure 2 to that shown in dotted lines in Figure 4 by the forces of set-back. Upon the diminution of the force of set-back, centrifugal force with the aid of the spring 10 will swing the element 14 outwardly and rearwardly for causing the shearing edge 15 to break the unshorting wire 9 for arming the squib.

A cover plate 17 is normally mounted above the body for closing its upper end.

Attention is directed particularly to the fact that the unshorting switch will be safe because both the forces of set-back and centrifugal force will be required to cause its operation. That is to say, in full inoperative position, centrifugal force along the radius would not displace the element due to the fact that the pin 13 provides a stop or lock for preventing outward movement. Also, set-back forces could at most move the element to the initial position shown in dotted lines. Obviously after set-back forces diminish the spring 10 would raise the element to its former inoperative position.

What is claimed is:

1. An unshorting switch for use in the electrical control circuit of a projectile and including a cylindrical container body, a shorting wire having a portion stretched across a radially extend-

ing opening in said body, an element in said opening having a cutting edge rotatable about a shaft with its ends slidably mounted in a pair of axially disposed tracks in the sides of said opening at a distance from the center of the body, a cover on the top of said body, resilient means for normally holding said element against said cover within said opening with its cutting edge upward and radially inward of the shaft, said element being movable downwardly in the opening in response to the force of set-back and turnable radially outwardly in response to centrifugal force so as to cut the shorting wire.

2. An unshorting switch comprising a body, a shorting wire stretched across an opening in said body, and cutting means operable within said opening responsive to the successive forces of set-back and centrifugal action of said body to cut said shorting wire.

3. An unshorting switch comprising a body, a shorting wire stretched across an opening in said body, and cutting means resiliently held in inoperative position within said opening and movable rearwardly therein in response to the force of set-back upon forward acceleration of said body to a position from which it is turnable within said opening in response to centrifugal force upon rotation of said body to cut said shorting wire.

4. An unshorting switch for use in the electrical control circuit of a projectile and including a container body, a shorting wire suspended in the body and an unshorting element for coaction therewith, a resilient support for the element in safety position, a supporting-mount for the element movable under setback from safety position to an intermediate position, and said element being operable under centrifugal force from the intermediate position to unshort the wire.

5. An unshorting switch for use in the electrical control circuit of a projectile and including a container body, a shorting wire suspended in the body, a mount including a pin and guide tracks in the body for said pin, a pivotal unshorting element mounted on the pin, and a resilient support for the element in safety position, said pin and element being movable under setback from safety position to an intermediate position and said element being operable under centrifugal force from the intermediate position to unshort the wire.

6. An unshorting switch including a body, a shorting wire mounted in the body, an unshorting element moveable to an initial position by setback forces acting upon the body and to an ultimate position by centrifugal forces acting upon the body, and means movably mounting the unshorting element in the body so that it may move to the initial and ultimate positions sequentially in response to setback and centrifugal force respectively.

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