Feb. 21, 1950 J. D. JORDAN ET AL 2,498,040

SETBACK SWITCH

Filed May 5, 1943

FIG. 1.

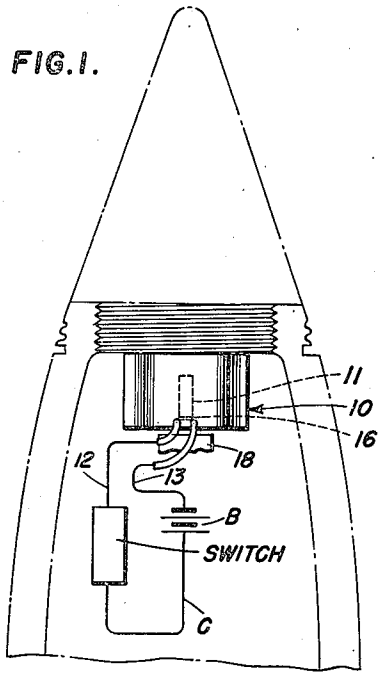
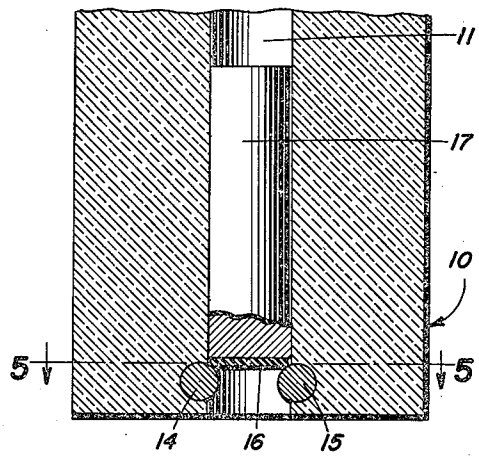


FIG. 2.



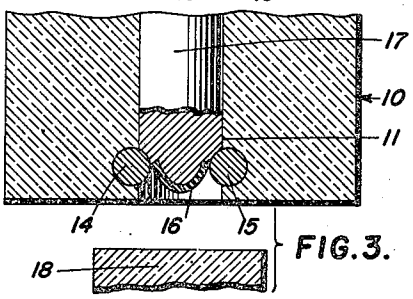


FIG. 3.

FIG. 5.

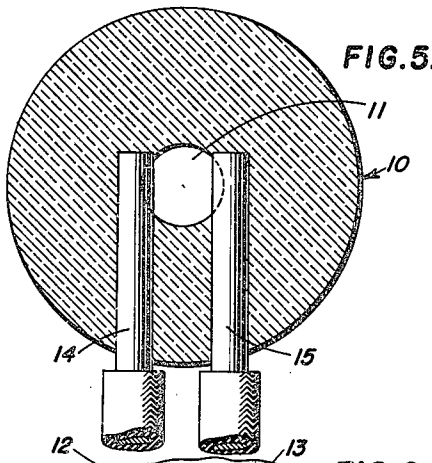


FIG. 6.

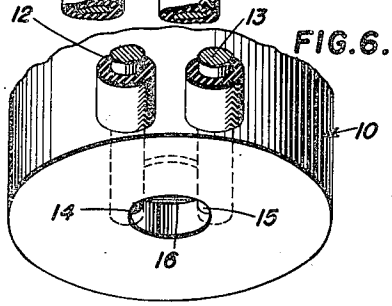
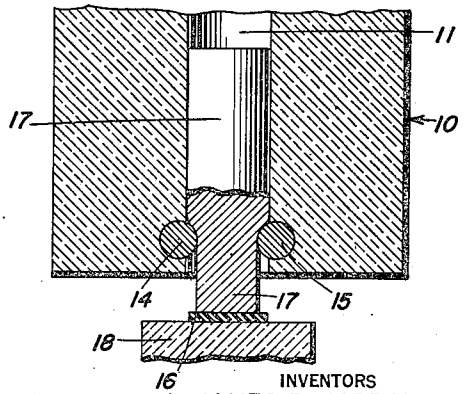


FIG. 4.



INVENTORS
JAMES D. JORDAN
BY ROBERT G. FERRIS
ATTORNEY

Patented Feb. 21, 1950

2,498,040

UNITED STATES PATENT OFFICE

2,498,040

SETBACK SWITCH

James D. Jordan, Washington, D. C., and Robert G. Ferris, Harvard, Ill., assignors to the United States of America as represented by the Secretary of the Navy

Application May 5, 1943, Serial No. 485,782

7 Claims. (Cl. 200—52)

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This invention relates to an improved set-back switch which is adapted to be mounted within an explosive projectile to close at least a portion of an electrical detonating circuit after the projectile has been fired.

The set-back switches of the prior art are dependent upon operation by movement of numerous mechanical parts. Many of these mechanical parts are close-fitting and require precision machining. Also, it is often difficult to assemble the parts, and if any one part is improperly made or assembled, the operation of the entire switch fails. Therefore, the objects of this invention are to provide a set-back switch which will operate to close at least a portion of an electrical detonating circuit within an explosive projectile upon the acceleration of the projectile when fired; to provide a set-back switch which will not operate to close the circuit until the projectile is fired; to provide a switch which is positive in function; and to provide a set-back switch wherein the numerous precision-made mechanical parts are eliminated. Still further objects of the invention, not specifically mentioned above, will be apparent during the course of the following description.

In the drawings:

Fig. 1 is a diagrammatic view showing the invention mounted within a projectile;

Fig. 2 is a vertical sectional view of the invention;

Fig. 3 is a fractional vertical sectional view of the invention showing the parts in position at the start of the acceleration of the projectile;

Fig. 4 is a fractional vertical sectional view showing the parts in the position after the acceleration of the projectile;

Fig. 5 is a cross-sectional view taken on line 5—5 of Fig. 2; and,

Fig. 6 is an inverted perspective view of a portion of the invention.

In the drawings, similar reference numerals will be used to indicate like parts throughout the views.

A body member 10, preferably in the form of a cylindrical block of Lucite or other suitable insulating material, is positioned within the projectile as shown in the Fig. 1. An electrical detonating circuit C, having a proximity fuze and suitable source of current B interposed therein, is also mounted within the projectile. The terminal ends of the circuit C are positioned within the block 10 as will hereinafter be described.

Suitably positioned within the block 10 is a bore or cylinder 11. Wires 12 and 13, which form a portion of the detonating circuit C, are stripped of insulation at their terminal ends to form contact members 14 and 15. These contact members 14 and 15 are mounted in the insulating block 10 through suitable bores therein and are located on either side of, and at right angles to, the bore 11 and are positioned so that at least a portion of each member extends within the bore (see Fig. 5). It will be noted that contact members 14 and 15 form a restriction within bore 11, and provide a support for a flexible insulating disc 16 which is also positioned within the bore 11. A pellet of malleable metal 17, which may be Wood's metal, is also positioned within the bore 11 beyond contact members 14 and 15 and is supported by the flexible insulating discs 16. A suitable abutment 18 is provided to act as a stop for the malleable metal 17 when set-back force is exerted thereon, the abutment 18 being located outside of the body member 10 in the form of the invention shown. However, it will be obvious that this abutment 18 may take the form of a disc or the like positioned within the rear portion of the bore 11 behind the contact members 14 and 15.

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The operation of the device will be readily understood from the foregoing description. Before the projectile is fired, the switch is in the position shown in Fig. 2 wherein the circuit C is in opened position because of the space between contact members 14 and 15 of wires 12 and 13 respectively. After the projectile has been fired, the force of the set-back acting upon the malleable metal 17 forces the metal 17 rearwardly against the flexible insulating disc 16 causing the insulating disc 16 to bend and assume the position as shown in Fig. 3. Continued set-back force upon the malleable metal will force the insulating disc through the restriction form by contact members 14 and 15 against the abutment 18. Simultaneously, the malleable metal 17 is also forced through the restriction and contacts members 14 and 15, thus closing at least a portion of the circuit C.

It will be obvious from the foregoing that the set-back switch which forms the subject matter of this invention is extremely simple in operation, positive in function, and the numerous mechanical parts formerly utilized to make a device of this character have been eliminated.

We claim:

1. A set-back switch adapted to be mounted within a projectile to close at least a portion of an electrical detonating circuit upon the appli-

cation of set-back force created when the projectile is fired comprising a body member, a bore in said body member, contact members mounted in spaced relation from each other in said body member, at least a portion of said contact members extending into said bore, and malleable metal positioned in said bore capable of being moved upon the application of set-back force, said malleable metal making contact between said contact members when moved upon the application of set-back force.

2. A set-back switch adapted to be mounted within a projectile to close at least a portion of an electrical detonating circuit upon the application of set-back force created when the projectile is fired comprising a body member, a bore in said body member, contact members mounted in spaced relation from each other in said body member, at least a portion of said contact members extending into said bore, malleable metal positioned in said bore capable of being moved upon the application of set-back force, said malleable metal making contact between said contact members when moved upon the application of set-back force, and means for preventing said malleable metal from making contact between said contact members until set-back force is exerted upon said malleable metal.

3. A set-back switch adapted to be mounted within a projectile to close at least a portion of an electrical detonating circuit upon the application of set-back force created when the projectile is fired comprising a body member, a bore in said body member, contact members mounted in spaced relation from each other in said body member, at least a portion of said contact members extending into said bore, malleable metal positioned in said bore capable of being moved upon the application of set-back force, said malleable metal making contact between said contact members when moved upon the application of set-back force, and displaceable insulating means positioned in said bore between said contact members and said malleable metal for preventing said malleable metal from making contact between said contact members, said insulating means being displaceable upon the application of set-back force.

4. A set-back switch adapted to be mounted within a projectile to close at least a portion of an electrical detonating circuit upon the application of set-back force created when the projectile is fired comprising a body member, a bore in said body member, contact members mounted in spaced relation from each other in said body member, at least a portion of said contact members extending into said bore forming a restriction therein, malleable metal positioned in said bore beyond said restriction capable of being moved within the restriction and making contact between said contact members upon the application of set-back force.

5. A set-back switch adapted to be mounted within a projectile to close at least a portion of an electrical detonating circuit upon the application of set-back force created when the projectile is fired comprising a body member, a bore in said body member, contact members mounted

in spaced relation from each other in said body member, at least a portion of said contact members extending into said bore forming a restriction therein, malleable metal positioned in said bore beyond said restriction capable of being moved within the restriction and making contact between said contact members upon the application of set-back force, and the means of preventing said malleable metal from entering the restriction until set-back force is exerted upon said malleable metal.

6. A set-back switch adapted to be mounted within a projectile to close at least a portion of an electrical detonating circuit upon the application of set-back force created when the projectile is fired comprising a body member, a bore in said body member, contact members mounted in spaced relation from each other in said body member, at least a portion of said contact members extending into said bore forming a restriction therein, malleable metal positioned in said bore beyond the restriction capable of being moved within the restriction and making contact between said contact members upon the application of set-back force, and a displaceable insulating disc positioned within said bore upon the restriction formed by the contact members to separate said members from said malleable metal, said insulating disc being displaceable upon the application of set-back force.

7. A set-back switch adapted to be mounted within a projectile to close at least a portion of an electrical detonating circuit upon the application of set-back force created when the projectile is fired comprising a body member of insulating material, a bore in said body member, a pair of contact members mounted in said body member at right angles to said bore and positioned within said body member so that a portion only of each contact member extends into said bore, said contact members being exposed ends of wires which form a part of the electrical detonating circuit, a flexible insulating disc positioned within said bore and mounted upon the portion of the exposed ends of wires which form the contact members, and malleable metal positioned in said bore beyond said insulating disc capable of being moved upon the application of set-back force, the set-back force exerted upon said malleable metal being sufficient to bend said insulating disc and force the same beyond the exposed ends of wire which form the contact members, thereby enabling the malleable metal to contact the contact members.

JAMES D. JORDAN.
ROBERT G. FERRIS.

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

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