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MOMENTARY SWITCH

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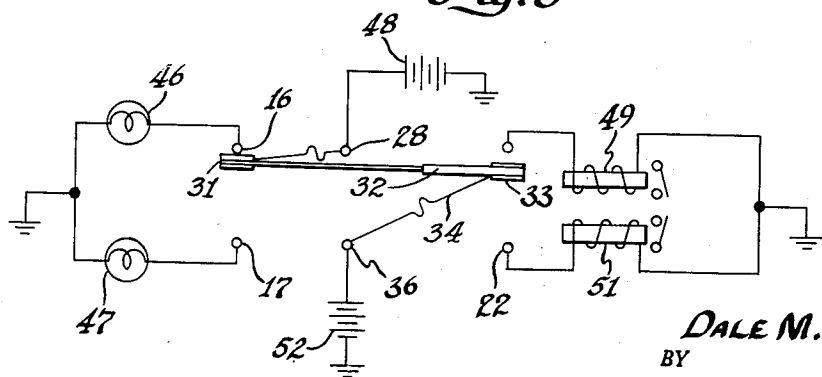
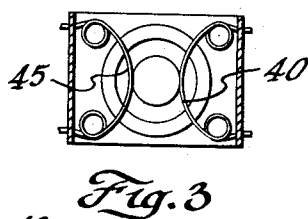
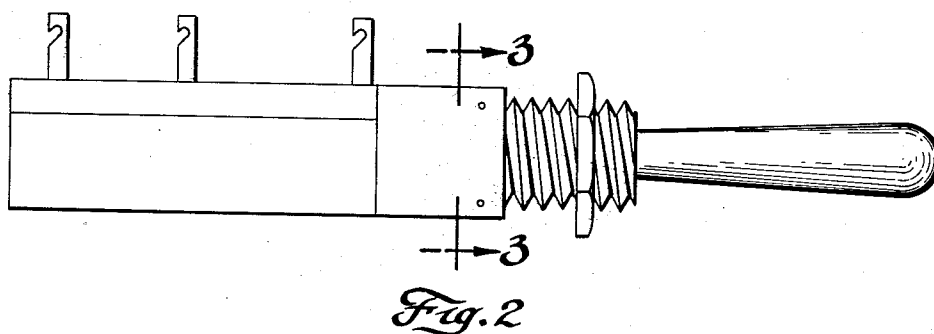
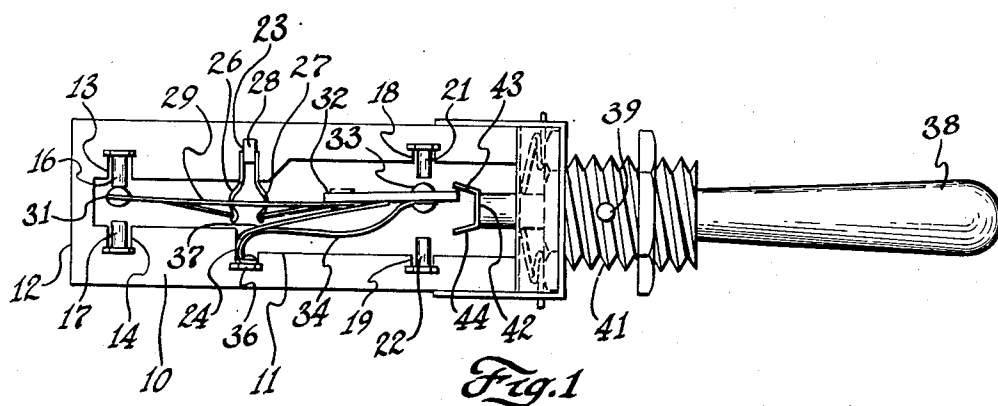


Fig. 4

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MOMENTARY SWITCH

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This invention relates to switches and in particular to a momentary switch which has a remembering circuit.

Many times it is desirable to know which direction a switch was last moved from the central neutral position. For example, in remotely controlling an airplane wherein the position of the elevator is adjusted by transmitting a signal from the remote position, if the observer is unable to see the aircraft he is controlling, it is practically impossible for him to remember the last information sent to the aircraft.

It is an object of this invention, therefore, to provide a momentary switch which has a remembering circuit connected therein for indicating the last position to which the switch was moved.

Another object of this invention is to provide a simple and economical remembering switch which will assure recollections of past switch movements.

A feature of this invention is found in the provision for a flexible switch which is movable to momentarily engage one of two contacts to actuate a relay, for example, and a second switch that is always in engagement with one of two contacts. The position of the second switch indicates the last contact made by the momentary switch.

Further objects, features and advantages of this invention will become apparent from the following description and claims when read in view of the drawings, in which:

Figure 1 is a top view of the switch of this invention with the cover removed;

Figure 2 is a side view of the switch with cover in place;

Figure 3 is a sectional view taken on line 3—3 of Figure 2 and illustrates the spring biasing unit for the switch lever; and,

Figure 4 is a circuit diagram of the switch of this invention.

Referring to Figure 1, a generally rectangular housing 10 which may be made of Bakelite, for example, is formed with a central opening 11. Adjacent one end 12 of the housing 10 are formed a pair of recesses 13 and 14 which are adapted for receiving therein electrical terminals 16 and 17 which extend into the opening 11. Adjacent the opposite end of the housing are formed a second pair of slots 18 and 19 which receive therein terminals 21 and 22, respectively.

Intermediate the ends of the member 10 are formed a pair of slots 23 and 24. A pair of curved spring straps 26 and 27 are received in the slot 23 and are fastened to a terminal 28. A flexible

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member 29 is formed with two longitudinal slots and the center portion, thus formed, has a small section removed for receiving the curved spring straps 26 and 27. The member 29 has attached at one end thereof an electrical contact 31 which is movable between the terminals 16 and 17, and has attached to the opposite end an insulating strap 32 to which is connected an electrical contact 33. A flexible metal conductor 34 extends from the contact 33 to a contact 36 mounted in the slot 24. An insulating strap 37 is attached to the terminal 36 and forms an insulating shield between the conductor 34 and the member 29. A throw arm 38 is pivotally supported by a pin 39 which passes through an extending threaded portion 41 of the member 10. The inner end of the arm 38 is formed with a U-shaped yoke 42 which is engageable with the end of portion 32. As is best shown in Figure 3, throw arm 38 is spring biased to a central neutral position by the springs 40 and 45 mounted in the member 41. Thus, when the switch is released it always returns to a neutral position.

The width of the yoke 42 is such that when the throw arm 38 is in the central neutral position, the contact 33 is held out of engagement with terminals 21 or 22. The lost motion allowed by the yoke 42 allows contact 33 to remain closely adjacent to the terminal which it last encountered, thus preventing the other contact 31 from changing position. For example, due to spring action contact 31 will always be engaged with either terminal 16 or 17. When the contact 33 is moved to engage terminal 21, the contact 31 will flip over to engage terminal 16. When the throw arm 38 is released, one arm 43 of the yoke 42 will move contact 33 out of engagement with terminal 21. The width of the yoke thus prevents the member 32 from being moved past the dead-center position, thus causing the contact 31 to change positions. When it is desired to momentarily connect contacts 33 and 22, the throw arm 38 is pivoted upwardly with respect to Figure 1 and the leg 43 of the yoke forces member 32 past dead-center until the contact 33 is engaged by the contact 22. As the member 32 passes dead center the spring compression in members 26 and 27 causes contact 31 to move from engagement with terminal 16 to engagement with terminal 17. As the throw arm 38 is released once again, the leg 43 of the yoke 42 holds the member 32 so that the contact 33 is out of engagement with terminal 22 while maintaining it below dead-center.

Figure 4 is a wiring diagram of the switch

illustrating how it may be used in a particular circuit. The contact 31 completes a circuit between terminal 28 and terminal 16 or 17. Lights 46 and 47 are connected in series with terminals 16 and 17, respectively, and to ground. A battery 48 is connected between ground and terminal 28. The members 26, 27 and 29 complete the electrical circuit between contact 31 and terminal 28. Movement of arm 33 momentarily completes a circuit through one of the two relays 49 and 51. The relays 49 and 51 may be connected to elevator raising and lowering circuits, respectively, which are actuated when the relays are closed. The contact 33 is electrically connected to terminal 36 by the conductor 34. A battery 52 is connected between terminal 36 and ground. Thus, once the contact 33 has engaged one of the terminals 21 or 22 the corresponding relay is actuated. The arm 33 may be released until it is desired to change the information given to the control circuit. The light which is illuminated reminds the operator to which position he last moved contact 33, and thus his next movement may be made with confidence.

This invention has many uses, and the aircraft illustration is used merely for explanatory purposes.

It is to be understood, of course, that although this invention has been described with respect to particular embodiments thereof, it is not to be so limited as changes and modifications may be made therein which are within the full intended scope of the invention, as defined by the appended claims.

I claim:

1. A momentary switch which has a remembering circuit comprising, a body portion formed with a central longitudinal opening, a first pair of terminals mounted adjacent one end of said body, a second pair of terminals mounted adjacent the opposite end, a third pair of terminals mounted intermediate said first and second pair of terminals, a throw arm pivotally supported by the opposite end of said body member, a flexible member engaged by the inner end of said throw arm and having a first contact movable between the second pair of terminals, a second contact connected to the opposite end of said flexible member and movable between the first pair of terminals, spring compression members attached to one of said third terminals and attached intermediate the ends of said flexible member, said first contact insulated from said flexible member and a conducting member connecting said insulated contact with the other of said intermediate terminals.

2. A switch which has a remembering portion comprising, a flexible centrally supported member formed with electrical contacts adjacent each end, a first pair of terminals engaged by one of said contacts, a second pair of terminals engageable by the other of said contacts, a throw arm pivotally supported adjacent said first pair of terminals and engageable with one end of said flexible member to move it from one to the other of said first pair of terminals, and said throw arm biased to a central position which holds one end of said flexible member out of engagement with the first pair of terminals.

3. A momentary switch which has a remembering circuit comprising, a body portion formed with a central longitudinal opening into which extend a plurality of terminals, a flexible mem-

ber centrally supported by a first of said terminals, a first contact attached adjacent one end of said flexible member and movable between a first pair of said terminals, an insulating member attached to the opposite end of said flexible member and a second contact mounted thereon and movable between a second pair of terminals, and a pivot arm supported by said body portion with one end having a yoke extending from the inner end thereof that is engageable with said insulating member to move said second contact from one to the other of said second pair of terminals.

4. A momentary switch which has a remembering portion comprising a body member formed with a longitudinal opening therein, a first pair of terminals mounted within said opening adjacent one end thereof, a second pair of terminals mounted adjacent the opposite end thereof, and a third pair of terminals mounted intermediate the ends thereof, spring means extending from one of said third pair of terminals, a flexible member formed with a pair of longitudinal slots and a transverse slot formed through the central portion of said flexible member and attached to said spring means, a first contact connected to one end of said flexible member and movable between said first pair of terminals, a second contact insulatingly mounted adjacent the opposite end of said flexible member and movable between said second pair of terminals, an arm pivotally supported adjacent one end of said body portion and having an engaging portion of a generally U shape for engaging the opposite end of said flexible member.

5. Apparatus according to claim 4 wherein said arm is spring-biased to a central position and wherein the engaging portion holds said second contact out of engagement with either of said second terminals except for momentary contact while said arm is depressed.

6. A momentary switch in combination with a remembering switch which indicates the last position of the momentary switch comprising, a body portion formed with a generally longitudinal opening therein, a flexible member formed with a pair of longitudinal slots and a transverse slot across the central portion thus formed, spring means engageable with the ends of said central portion within said transverse slot and attached to said body portion, a first contact mounted in one end of said flexible member, a second contact insulatingly mounted in the opposite end of said flexible member, a first pair of terminals mounted in said body portion adjacent said first contact and engageable therewith, a second pair of terminals mounted in said body portion adjacent said second contact and engageable therewith, an arm pivotally supported adjacent one end of said body portion and having an engaging portion of a generally U shape adjacent one end thereof and one end of said flexible member received within said U portion for a lost motion connection therewith.

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