Aug. 4, 1964 H. W. BROWN 3,143,606

DEPRESSIBLE TRIGGER SWITCH WITH MANUAL ADJUSTABLE CONTACT MEANS

Filed May 15, 1962 3 Sheets-Sheet 1

Fig. 1

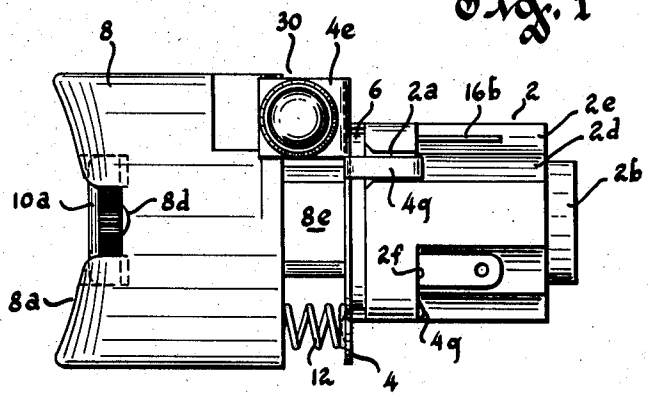


Fig. 2

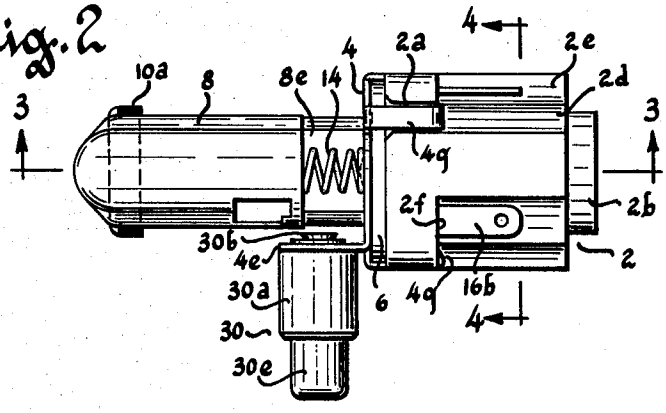
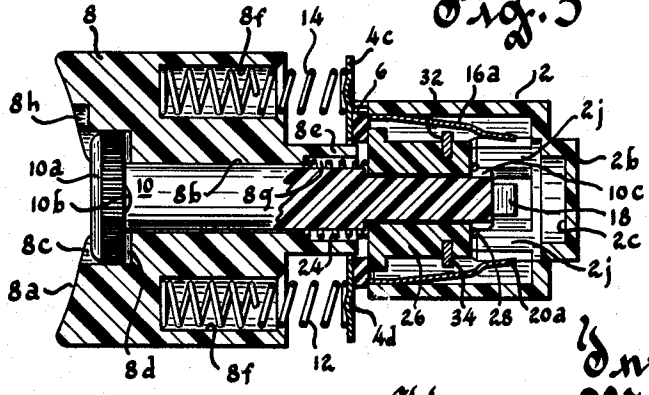


Fig. 3



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DEPRESSIBLE TRIGGER SWITCH WITH MANUAL ADJUSTABLE CONTACT MEANS

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Fig. 4

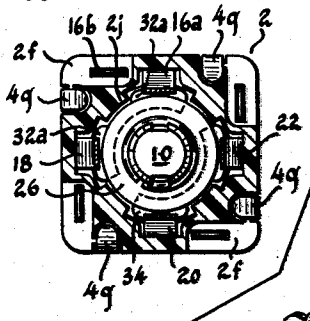


Fig. 5

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DEPRESSIBLE TRIGGER SWITCH WITH MANUAL ADJUSTABLE CONTACT MEANS

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Fig. 7

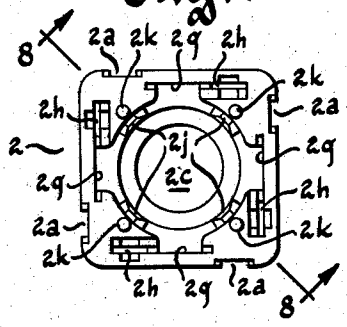


Fig. 8

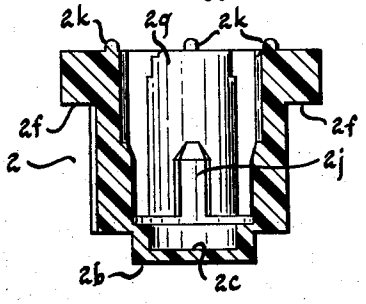


Fig. 6

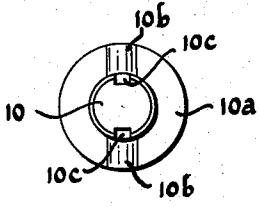


Fig. 9

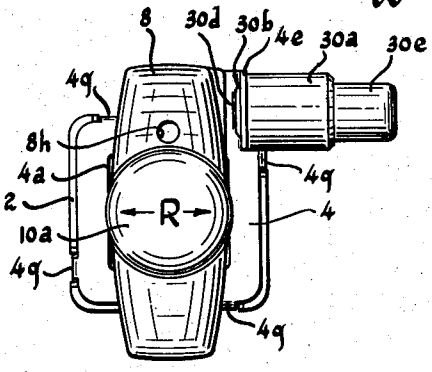


Fig. 10

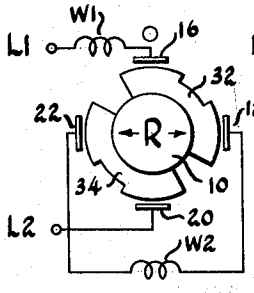


Fig. 11

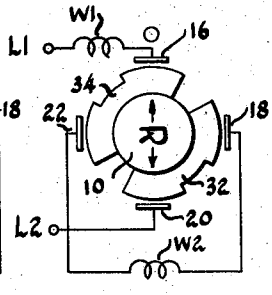


Fig. 12

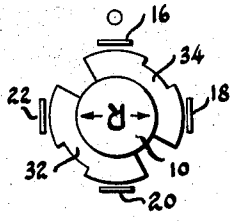
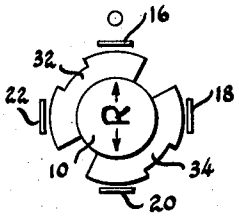


Fig. 13



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United States Patent Office

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DEPRESSIBLE TRIGGER SWITCH WITH MANUAL ADJUSTABLE CONTACT MEANS

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Filed May 15, 1962, Ser. No. 194,811
15 Claims. (Cl. 200—6)

This invention relates to selector switches and more particularly to an electrical switch which is selectively adjustable from a first condition wherein it is operable to perform a first switching operation to a second condition wherein it is operable to perform a second or different switching operation.

While not limited thereto, the invention is especially applicable to depressible trigger switches for selectively controlling reverse energizations of portable tool motors or the like.

An object of the invention is to provide an improved electrical switch.

Another object of the invention is to provide an improved reversible trigger switch for use on a portable tool handle.

A more specific object of the invention is to provide an improved electrical selector switch operating mechanism.

Another specific object of the invention is to provide a depressible switch operator with improved means for selecting different switch contacts for operation.

Another specific object of the invention is to provide a switch with two pairs of contacts adapted for connection to external circuits and depressible trigger operated means for bridging the contacts of the respective pairs thereof and selector means extending through such trigger for resetting said switch so that the contacts of one pair are connected to the respective contacts of the other pair when the trigger is depressed.

A further specific object of the invention is to provide an improved depressible trigger switch operable to bridge forwardly motor operating contacts and being provided with readily adjustable selector means extending through the trigger and being rotatable to select reversely motor operating contacts for bridging when the trigger is depressed.

Other objects and advantages of the invention will hereinafter appear.

According to the invention there is provided a trigger switch of the preselector type which is adapted for mounting in the handle of a portable electric tool or the like. When so mounted, the body of the switch is within the handle and the trigger projects from the handle so that it may be pressed to close the switch. The switch is provided with selectable contacts and a selector shaft extends through the trigger and has an external button which may be rotated ninety degrees to select pairs of contacts for bridging when the trigger is pressed. The switch is constructed so that the selector shaft cannot be rotated while the trigger is depressed. The selection must first be made and then the trigger is pressed to close the selected contacts.

These and other objects and advantages of the invention and the manner of obtaining them will best be understood by reference to the following detailed description

of an embodiment of the invention taken in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a right side elevation view of a selector type trigger switch constructed in accordance with the invention;

FIG. 2 is a top plan view of the switch of FIG. 1;

FIG. 3 is a cross-sectional view taken along line 3—3 of FIG. 2;

FIG. 4 is a cross-sectional view of the switch taken along line 4—4 of FIG. 2;

FIG. 5 is an isometric exploded view of the parts of the switch of FIG. 1;

FIG. 6 is a rear view of the selector shaft;

FIG. 7 is a front view of the base showing the interior thereof;

FIG. 8 is a cross-sectional view taken along line 8—8 of FIG. 7;

FIG. 9 is a front view of the switch of FIG. 1; and

FIGS. 10, 11, 12 and 13 are front views of the selector shaft, the movable bridging contacts and the stationary contacts showing the four positions thereof.

Referring to FIGS. 1 and 2, there is shown a trigger switch of the selector type comprising a supporting member or base **2**, a switch frame **4**, an insulator **6** between the base and the frame, a trigger **8** for actuating the switch and a selector shaft **10** for selecting different pairs of contacts for bridging when the trigger is pressed. The switch also comprises a pair of helical compression springs **12** and **14** for restoring the trigger and opening the switch contacts when the trigger is released.

As shown in FIGS. 3, 7 and 8, base **2** is substantially cup-shaped having sides and a closed end and an open end as seen in FIG. 8. The open end has a generally square configuration as shown in FIG. 7 and the profile thereof is broken by four grooves **2***a*, one such groove adjacent each corner, for receiving securing straps of the switch frame which are bent around the edge of the base as hereinafter more fully described. Base **2** is provided with a projection **2***b* in its closed end which is illustrated as being round and which is provided within the base with a flat round recess **2***c* to provide room for the rear end of shaft **10** when the trigger is pressed all the way in.

Base **2** is provided with a pair of grooves **2***d* and **2***e* on each corner thereof extending from the closed end to a point near the open end thereof. Groove **2***d* is deeper than and communicates with strap groove **2***a* to provide an overhanging edge **2***f* on each corner of the base most clearly shown in FIG. 8 to the rear side of which the end of each frame strap can be bent to secure the frame to the base. Groove **2***e* is on the other side of each corner of the base from groove **2***d*. Groove **2***e* is wider than and long as groove **2***d* to provide room for the contact terminals which extend through edge **2***f* as hereinafter more fully described.

Base **2** is provided with an inner cavity having a generally round and elongated or cylindrical configuration as most clearly shown in FIGS. 7 and 8 and extending all the way from recess **2***c* to the open end of the base. The inner walls of this cavity are provided with four grooves **2***g* spaced ninety degrees from each other and extending toward the middle of each side of the square-shaped base as shown in FIG. 7. These grooves are provided to accommodate stationary contacts hereinafter described. Adjacent each such groove **2***g* and between such groove and

the clockwise corner of the base in FIG. 7, a slot 2*h* extends all the way through overhanging edge 2*f* into communication with exterior groove 2*e*.

Between grooves 2*g* within the cavity of base 2, there are provided inwardly projecting ridges 2*j* as shown in FIG. 7 which prevent turning of shaft 10 when the trigger is in its depressed position. As shown in FIG. 8, ridges 2*j* extend from the closed end of the base about halfway toward the open end thereof and are each provided with a beveled end to prevent interference with movement of the bridging contacts when the trigger is pressed.

As most clearly shown in FIGS. 4 and 5, there are provided four like stationary contact clips or springs 16, 18, 20 and 22. Each contact clip such as contact clip 16 in FIG. 5 is of generally U-shaped configuration. One leg 16*a* forms a stationary spring contact and is bent inwardly within the base cavity as shown in FIG. 3 to form a cam surface for cooperation with a movable contact bridge or contactor hereinafter described. The other leg 16*b* thereof extends through slot 2*h* to the exterior of the base and further extends partway along groove 2*e* to form an electrical terminal or connector member to which an electrical conductor may be connected.

Trigger 8 is provided with a rearwardly curved front end 8*a* which is rounded for engagement by the finger of the operator. A hole 8*b* extends through the trigger and the center portion of the curved front end thereof is provided with a recess 8*c* to accommodate the enlarged end 10*a* of shaft 10. As most clearly shown in FIGS. 2 and 9, the diameter of enlarged end 10*a* of the shaft is greater than the lateral width of trigger 8. Recess 8*c* is open at its opposite sides and the opposite sides of enlarged end 10*a* of the shaft extend beyond the opposite sides of the trigger so that end 10*a* can be gripped by the fingers and rotated. Enlarged end 10*a* is provided with milled grooves or is suitably roughened on its rounded portion to facilitate turning thereof. The bottom of recess 8*c* is provided with four rounded grooves 8*d* spaced ninety degrees apart as shown in FIG. 5. The rear surface of enlarged end 10*a* of shaft 10 is provided with a pair of oppositely disposed rounded ridges 10*b* shown in FIGS. 3 and 6 for complementary engagement in linearly arranged grooves 8*d* in the trigger to stop the shaft at ninety degree intervals when it is rotated.

The central portion of the trigger at the rear end thereof is provided with a substantially square projection 8*e* through which hole 8*b* extends. A pair of round recesses 8*f* are provided in the rear end of trigger 8, one on each side of projection 8*e* for retaining compression springs 14. A hole 8*g* slightly larger in diameter than hole 8*b* extends part way into projection 8*e* from the rear end thereof to provide space for a helical compression spring 24 which biases shaft 10 so that ridges 10*b* snap into one or the other pair of oppositely disposed grooves 8*d* when the shaft is rotated. Return springs 12 and 14 also assist in biasing the trigger against enlarged end 10*a* of selector shaft 10 to bias the ridges in the grooves for selector shaft indexing purposes.

As most clearly shown in FIGS. 3, 5 and 6, the rear end of shaft 10 is provided on opposite sides thereof with keyways or grooves 10*c* extending from the rear end thereof a sufficient distance to receive the key-like ridges of a contact carrier 26 hereinafter described. The extreme rear end of shaft 10 is provided with an annular groove 10*d* therearound for receiving a split ring 28 to retain the contact carrier on the shaft against the force of spring 24.

Frame 4 comprises a sheet metal stamping the body portion of which has a substantially square configuration having a square aperture 4*a* therein of a size freely to slide over projection 8*e* of the trigger. Frame 4 is provided with a pair of ears 4*b* and 4*c* extending in opposite directions from opposite edges of the frame to overlie recesses 8*f* in the trigger. Ears 4*b* and 4*c* are each provided on the front surface with a rounded raised portion or bead 4*d*. These beads fit within the ends of springs 12 and 14 to retain the springs from slipping off the ears. Ear 4*c* has integrally formed therewith a portion extending along the adjacent side of the frame and having a projection 4*e* extending forwardly at ninety degrees from the frame. Projection 4*e* is provided with a hole 4*f* for supporting a locking pin 30. Locking pin 30 is of a known type and is provided with a cage or bushing 30*a* having a short sleeve 30*b* of smaller diameter which extends through hole 4*f* and is riveted on the other surface of projection 4*e*. A helical compression spring 30*c* surrounds reduced portion 30*d* of pin 30*e*. Reduced portion 30*d* extends through bushing 30*a* and through sleeve 30*b* and the end thereof is spread so that reduced portion 30*d* will slide in sleeve 30*b* when the pin is depressed against the force of spring 30*c* but the pin cannot be withdrawn from the bushing. Frame 4 is further provided with four straps 4*g* extending rearwardly from adjacent the corners thereof for securing the parts together as hereinafter described.

Insulator 6 is a flat piece of insulating material having an external configuration substantially corresponding to the square body portion of frame 4. Insulator 6 is provided with a square aperture 6*a* corresponding to aperture 4*a*. Aperture 6*a* has radically extending slots 6*b* at the corners thereof for receiving projections 2*k* extending forwardly from the corners of the open end of the base adjacent connector terminal slots 2*h*. As will be apparent, projections 2*k* fit into slots 6*b* to fix the base and insulator with respect to one another.

Contact carrier 26 comprises a generally cylindrical insulating member having an annular flange 26*a* at its forward end to overlie margins of the insulator aperture 6*a*. Carrier 26 is provided with a bore 26*b* therethrough which is round except for a pair of opposed key-like ridges 26*c* extending toward one another from opposite sides of the bore 180 degrees apart and throughout the length of the bore. Bore 26*f* is of a diameter whereby the contact carrier slides onto the end of shaft 10 with ridges 26*c* in complementary interfitting engagement in grooves 10*c* in the shaft. A pair of arcuate grooves 26*d* are provided adjacent the rear end of the contact carrier and extend partway around opposite sides thereof. These grooves 26*d* snugly receive a pair of arcuate bridging contacts or contactors 32 and 34. Each movable or bridging contact such as 32 is provided with a narrow central portion as shown in FIG. 5 for fitting fully within its associated groove 26*d* and wider end portions 32*a* which extend beyond the outer surface of carrier 26 for engaging a pair of stationary spring contacts as shown in FIG. 4.

To assemble the switch, shaft 10 is slid into the hole in trigger 8 and springs 12 and 14 are inserted in their respective recesses 8*f* in the trigger. Spring 24 is placed in hole 8*g* in the trigger around the shaft, and frame 4 and insulator 6 are placed on projection 8*e* so that ears 4*b* and 4*c* bear against springs 12 and 14, respectively, and lock pin mount or projection 4*e* is on the right side of the trigger and on the same side as reference mark or recess 8*h* as shown in FIG. 9. Contact carrier 26 is then slid on shaft 10 so that springs 12 and 14 are slightly compressed and spring 24 is compressed a substantially greater amount and retaining ring 28 is snapped into groove 10*d* to retain these parts together in subassembly. Alternatively, retaining ring 28 and its annular groove 10*d*, could be replaced by a tubular extreme end on shaft 10 which is riveted over a washer placed against the rear end of the contact carrier.

Combined stationary contact springs and connector terminals 16, 18, 20 and 22 are then inserted in the base 2. Movable bridging contacts 32 and 34 are inserted in grooves 26*d* in the contact carrier. The contact carrier portion of such subassembly is then inserted inside the base so that projections 2*k* enter slots 6*b* in the insulator.

This insertion causes straps 4*g* of the frame to slide along grooves 2*a* in the base whereafter the ends of the straps are bent inwardly and forwardly to rigidly secure the switch subassembly to the base. To prevent the bent-over ends of the straps from slipping off the overhanging edge of the base, the rear surface of the overhanging edge at the end of each groove 2*d* is undercut at an angle of substantially thirty degrees. As a result, the ends of the frame securing straps can be bent about 120 degrees securely to grip and retain the base attached to the frame.

FIG. 10 shows a first position of selector shaft **10**. In this position, depression of the trigger causes movable contact **32** to bridge contacts **16** and **18** and causes movable contact **34** to bridge stationary contacts **20** and **22**. FIG. 10 also shows a circuit diagram illustrating an exemplary use of the switch. In FIG. 10, alternating current may be connected to lines **L1** and **L2**. Line **L1** is connected through winding **W1** of a two-winding alternating current motor to contact **16**. Line **L2** is connected to contact **20**. Contact **18** is connected through winding **W2** of the motor to contact **22**.

When the selector shaft is in the position shown in FIG. 10 and the trigger is depressed, the motor will be energized for rotation in one direction. When the selector shaft is rotated ninety degrees to the position shown in FIG. 11 and the trigger is depressed, the phase of winding **W2** will be reversed to cause the motor to be energized for rotation in the opposite or reverse direction. When the selector shaft is rotated another ninety degrees to the position shown in FIG. 12, the switch will be in the same condition as in FIG. 10. A further ninety degrees rotation of the shaft to the position shown in FIG. 13 will restore the condition shown in FIG. 11. As will be apparent, each ninety degree rotation of the selector shaft will set the switch for reversing the motor from its immediately preceding direction of rotation. Also, ninety degree forward and ninety degree reverse rotation of the selector shaft will do the same thing. It will, therefore, be apparent that the invention provides a double-pole double throw switch which can be preset for either its first or second throw by turning the selector shaft ninety degrees.

When the selector shaft is turned, ridges **10***b* on the enlarged end of the shaft are forced out of alined grooves **8***b* in the trigger recess **8***c* against the force of spring **24**. Spring **24** is compressed between contact carrier **26** and the trigger. As the contact carrier is held rigidly to shaft **10** by split ring **28**, spring **24** biases the trigger against the rear surface of enlarged end **10***a* of the shaft. Consequently, when the shaft is turned ninety degrees, this bias causes ridges **10***b* to snap into the other pair of alined grooves **8***b*. Alternatively, spring **24** could be omitted and hole **8***b* left unenlarged at **8***g* and springs **12** and **14** would then be relied upon to bias ridges **10***b* into grooves **8***d* for indexing purposes.

The switch is constructed so that the selector shaft can be turned only when the trigger is undepressed to prevent damaging the contacts. As shown in FIG. 3, movable contacts **32** and **34** are disengaged from stationary contacts **16** and **20** when the trigger is restored so that the shaft can be turned. Also, the movable contacts are clear of ridges **2***j* shown in FIGS. 7 and 8 to permit the contact carrier and the movable contacts to be rotated with the shaft.

When the trigger is depressed, return springs **12** and **14** are compressed. The trigger carries spring **24**, selector shaft **10**, contact carrier **26** and contacts **32** and **34** with it. Movable contacts **32** and **34** engage the offset portions at the ends of the stationary contact springs and slide therealong almost to the ends thereof. The bias of the stationary contact springs maintains good electrical connection between the stationary and movable bridging contacts. Release of the trigger causes springs **12** and **14** to restore the switch to the position shown in FIG. 3 with the contacts open.

It will be apparent that the selector shaft cannot be turned when the trigger is depressed. When the trigger is depressed, the wider end portions **32***a* of contact **32** enter on opposite sides of the corresponding ridge **2***j* as shown in FIG. 4 thereby to prevent rotary movement of contact **32**. Since the movable contacts are confined in grooves **26***d* in the contact carrier and the contact carrier is keyed to the shaft, ridges **2***j* also prevent rotation of the shaft while the trigger is in its depressed position. Restoration of the trigger causes contacts **32** and **34** to clear ridges **2***j* as shown in FIG. 3 so that the shaft can be rotated.

While the device hereinbefore described is effectively adapted to fulfill the objects stated, it is to be understood that I do not intend to confine my invention to the particular preferred embodiment of selector switch disclosed, inasmuch as it is susceptible of various modifications without departing from the scope of the appended claims.

I claim:

1. An electric switch comprising:
an insulating base having a cavity therein;
a plurality of stationary contacts supported by said base within said cavity;
a movable contact carrier confined within said cavity and having at least one contact mounted thereon;
a trigger member externally of said base;
a contact selector member having a portion extending into said cavity to which said contact carrier is coupled and having an external portion;
means coupling the external portion of said selector member to said trigger member including a portion of said selector member externally of said trigger member to afford movement of said contact carrier by said selector member relative to said trigger member and said base thereby to preselect one or another of said stationary contacts for engagement by said movable contact;
spring means between said trigger member and said base biasing said trigger member a limited extent in a direction away from said base to maintain said movable contact separated from the selected stationary contact;
and said trigger member being movable against the force of said spring means to afford movement of said selector member and said contact carrier therewith to close the selected contacts.

2. The invention defined in claim 1, wherein said trigger member comprises a guiding portion at the side thereof adjacent said base;
and means confining said guiding portion to afford non-rotatable linear movement of said trigger member against the force of said spring means.

3. The invention defined in claim 1, wherein said selector member and coupling means comprises:
a rotatable shaft extending through a hole in said trigger member into said cavity and having an enlarged head portion bearing against said trigger member and by which said shaft may be turned to rotate said contact carrier into different selective positions.

4. The invention defined in claim 3, together with:
indexing means between relatively rotatable portions of said switch comprising interfitting projections and notches for maintaining said rotatable shaft in each selected angular position under the force of said spring means.

5. The invention defined in claim 1, wherein each said stationary contact comprises:
a U-shaped member having one leg for engagement by the movable contact and another leg for connection to an external circuit.

6. An electrical switch comprising:
an insulating base;
a plurality of stationary contacts in said base;

a contact carrier having at least one movable contact mounted thereon;
a contact selector member connected to said contact carrier and being operable to preset said movable contact and thereby to preselect any one of said stationary contacts for engagement by said movable contact;
and a spring biased actuator for moving said selector member and said contact carrier so that said movable contact engages the selected stationary contact;
and said insulating base comprising:
a cup-shaped molded housing having closed side walls and bottom and an open end;
means closing said open end and having an aperture through which said selector member extends into said housing, said contact carrier being secured to said selector member within said housing;
grooves in said housing and slots extending through the edges of the open end thereof;
and integral connector terminals on said stationary contacts extending through said slots to the exterior of the housing and being held in said slots to position the stationary contacts in said grooves for sliding engagement by the movable contact when said actuator is moved.

7. An electrical switch comprising:
an insulating base;
a plurality of stationary contacts in said base;
a contact carrier having arcuate movable contacts mounted thereon for bridging pairs of said stationary contacts;
a contact selector member connected to said contact carrier and being operable to preset said movable contacts and thereby to preselect one or another pair of stationary contacts for engagement by a movable contact;
and a spring biased actuator for moving said selector member and said contact carrier so that said movable contact engages the selected stationary contacts;
and said insulating base comprising:
a cup-shaped molded housing having closed side walls and bottom and an open end;
means closing said open end and having an aperture through which said selector member extends into said housing, said contact carrier being secured to said selector member within said housing;
and means molded on the inner walls of said housing for retaining said stationary contacts in angularly spaced relation.

8. The invention defined in claim 7, wherein said closing means comprises:
a metal frame attached to said selector member by said contact carrier and having a plurality of straps, the ends of which are bent over portions of said housing to secure said frame to said housing;
and an insulator between said frame and housing for insulating the stationary contacts within said housing from said frame.

9. An electrical switch comprising:
an insulating base;
a plurality of stationary contacts in said base;
a contact carrier having at least one movable contact mounted thereon;
a contact selector member connected to said contact carrier and being operable to preset said movable contact and thereby to preselect any one of said stationary contacts for engagement by said movable contact;
a spring biased actuator for moving said selector member and said contact carrier so that said movable contact engages the selected stationary contact;
said actuator comprising a trigger which is depressible to close the switch contacts;
said selector member comprising a rotary shaft extending through said trigger into said base;

a frame secured to said trigger and shaft by said contact carrier;
spring means biasing said trigger away from said frame;
and means on said frame for rigidly securing the same to said base.

10. The invention defined in claim 9, wherein said contact carrier comprises:
a cylindrical member keyed to the end of said selector shaft within said base;
and arcuate grooves on said cylindrical member for accommodating movable contacts which are retained in said grooves by the inner walls of said base.

11. An electrical switch comprising:
an insulating base;
a plurality of stationary contacts in said base;
a contact carrier having movable contacts mounted thereon;
a contact selector member connected to said contact carrier and being operable to preset said movable contacts and thereby to preselect one or another of said stationary contacts for engagement by respective movable contacts;
a spring-biased actuator for moving said selector member and said contact carrier so that said movable contacts engage the selected stationary contacts;
and cooperating means on the inner walls of said base and on said movable contacts for preventing actuation of said selector member when the contacts are closed.

12. The invention defined in claim 11, wherein said cooperating means comprises:
slots on the movable contacts;
and molded ridges extending partway along the inner walls of the base, said slots riding onto said ridges when said actuator is depressed to prevent rotation of said selector member and being clear of said ridges when said actuator is underpressed to permit rotation of said selector member.

13. A trigger actuated selector switch comprising:
an insulating base having a cavity therein;
stationary contacts mounted in said cavity;
a trigger member externally of said base;
means secured to said base for restricting said trigger member for linear movement toward said base and preventing rotation thereof;
a selector member extending through a hole in said trigger member into said cavity and being confined to rotary movement relative to said trigger member;
spring means between said trigger member and said base biasing said trigger member away from said base and against a portion of said selector member;
a contact carrier secured to said selector member within said cavity including means coupling said selector member to said trigger member for linear movement together and abutting said restricting means under the force of said spring means;
and at least one contact on said contact carrier for connecting a pair of stationary contacts when said trigger member is depressed and for connecting a different pair of stationary contacts when said selector member is rotated before said trigger member is depressed.

14. The invention defined in claim 13, wherein said selector member comprises:
an enlarged head on the external end thereof against which said trigger member bears under the force of said spring means;
and a recess in said trigger member accommodating a portion of said enlarged head leaving other portions of the latter accessible for tuning said selector member.

15. An electric switch of the self-enclosed trigger actuated type adapted for mounting in a housing so that the self-enclosed switch is within the housing and the

actuator extends through an aperture for manual depression comprising:

an insulating base;

a plurality of stationary contacts mounted within said base;

a movable contact carrier within said base having at least one contact mounted thereon;

a contact selector extending into said base to support said contact carrier and being operable to rotate said contact carrier thereby to preselect another stationary contact for engagement by said movable contact;

and a spring biased member through which said contact selector rotatably extends and being axially movable with said contact selector after said preselection has been made to close the selected contacts, said

member having a narrow elongated cross-sectional shape and slidable in the aperture in the housing;

and said contact selector having an enlarged head portion to facilitate rotation thereof in its undepressed position.

References Cited in the file of this patent

UNITED STATES PATENTS

2,255,552	Bluemle et al.	Sept. 9, 1941
2,420,768	Beveridge	May 20, 1947
2,857,485	Brooks	Oct. 21, 1958
3,004,119	Gerrie	Oct. 10, 1961

FOREIGN PATENTS

1,069,452	France	Jan. 6, 1953
1,100,757	Germany	Mar. 2, 1961