This invention relates to electrical switches and has particular pertinency to such switches and devices known as plunger switches.

Broadly stated the invention contemplates the provision of a plunger switch which will operate in an improved manner and at the same time be efficient and economical to manufacture. This is accomplished by providing an improved overall construction for the switch including assembly features which allow the base cap, contact bar and plunger assembly to be snap fastened into place in the housing.

The switch utilizes a folded accordion ribbon type spring which is molded as an integral part of the plunger and the base cap. A rectangular metal shorting bar is sandwiched between two sections of the spring and may be pressed into place utilizing a slot in the molded spring part. The plunger, springs and base cap are molded as one unit.

The primary object of the invention, therefore, is to provide a plunger switch construction having improved operating characteristics.

Another important object of the present invention is to provide a plunger switch construction which lends itself to an efficient and economical manner of manufacture. A further important object of the invention is to provide a plunger switch construction which is strong and durable and capable of reliable performance over a long period of time.

A still further object of the invention is to provide a plunger switch which utilizes a novel plunger incorporating a bridging contact mechanism of extreme simplicity.

Yet another object of the invention is to provide a switch mechanism having a snap-in interrelationship of parts which allows for lower assembly and fabrication costs.

Other objects and advantages of the invention will become apparent from the following detailed description read in conjunction with the accompanying drawings wherein like reference numbers designate corresponding parts in all the views.

In the drawing:

FIG. 1 is a longitudinal sectional view of the plunger switch embodying the invention useful in showing the ease of assembly of the switch and the fewness of parts, and

FIG. 2 is a plan view of the embodiment of the invention shown in FIG. 1.

Generally speaking, the invention comprises a plunger switch comprising a molded casing comprising an external wall. A bore having sections of varying diameters longitudinally passes therethrough to create openings at each end. A plurality of slots are cut through the wall extending into said bore. The slots have electrical terminals therein. One end of the bore is closed by means of the plunger. A snap-in cap at the other end of the bore closes the same. A coiled spring is integrally joined to the cap and the plunger with a metal shorting bar being held by the coiled spring. The plunger is slidable moved in the bore of the switch so that the shorting bar engages the terminals in the slots.

Having reference now to the drawings which illustrate a typical embodiment of the invention for the purpose of disclosure it is seen that the switch 10 utilizes a folded accordion ribbon type spring 11 which is molded as an integral part of the plunger 27 and base cap 28. A rectangular metal shorting bar 14 is sandwiched in a section 16 between two parts 17, 18 of the spring. The shorting bar may either be added by the molder as an insert in the mold or is added at assembly by pressing it into place utilizing a slot in the molded spring part.

The plunger, springs and base cap may be unitarily molded as one unit. The switch, as configured, has a maximum number of two molded parts plus the addition of a shorting bar and connector contact 20. Only three parts would thus be handled at final assembly allowing for considerable cost and labor reduction.

The switch casing 21 is of a molded construction having a head section 38 to which an integral folded side wall is connected. The side wall has a multiplicity of slots 22 formed therein whereby splice terminals 23 may be inserted and retained by molded lugs or protuberances 24. The casing has a central bore 25 of varying cross sectional diameters 26, 29 formed therein to accommodate the plunger mechanism which includes the molded spring having a portion slotted to hold the shorting bar 14. One end of the spring is attached to the plunger head 27 which is contained by a shoulder 30 formed at the top of the casing. The other end of the spring is integrally formed to the bottom cap or closure 28 of the switch which is snap fitted into molded prongs or extensions 40 formed at the end of the casing. These prongs have a molded lip 41 configuration such that the cap is retained therein against the molded lip 41. It is apparent that the switch by the addition of spring connectors 20 may be adapted to varying type of switch adjustments and purposes. The entire arrangement utilizes a snap in locking construction which make the assembly of exceeding simplicity.

In the construction exemplified the ends 44 of the male spade flag terminals 23 are used as switch contacting members. The use of the molded casing construction allows the switch assembly to be snapped into an associated mounting panel. The snap in feature is utilized in the molded construction of the slots so that external spade terminals of associated equipment can be easily inserted into the switch housing and held therein by the protuberances 24 making it universal in application and reducing the need for additional hardware. The entire assembly incorporates the facility of having the unitary base cap, contact bar and plunger snap fastened into place in the housing. By the usage of the spring connector contact 20, the switch serves as a basic unit. For example, a single pole-single throw (SPST) normally closed; single pole-single throw normally (SPST) open or a single pole-double throw (SPDT) switch may be obtained since the casing of the switch has slots which allow for the placement of two or three spade terminals which are necessary to fulfill the needed switch requirements.

The above constructed switch provides an extremely flexible and inexpensive construction which may be altered or embodied in other specific forms without departing from the spirit or essential characteristics thereof. The embodiment disclosed is therefor to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims.

What is claimed is:

1. A plunger switch having a casing comprising an external wall, a bore longitudinally passing therethrough to create openings at each end, a plurality of slots cut through said wall extending into said bore, said slots having electrical terminals therein, one end of said bore being
closed by means of a plunger, a cap at said other end for
closing the same, a molded coiled spring integrally joined
to said cap and said plunger, said plunger having a head
portion contained by a shoulder, and a metal shorting
bar held by said coiled spring, said plunger moveable in
said bore of said switch so that said shorting bar engages
said terminals in said slots.

2. A plunger switch having a molded casing compris-
ing an external wall, a bore longitudinally passing there-
through to create openings at each end, a plurality of
slots cut through said wall extending into said bore, said
slots having electrical terminals therein, one end of said
bore being closed by means of a plunger, a molded-snap-
fit cap at said other end for closing the same, a molded
coiled spring integrally joined to said cap and said
plunger, said plunger having a head portion contained
by a shoulder, a metal shorting bar held by said coiled
spring, said plunger slideable in said bore of said switch
so that said shorting bar engages said terminals in said
slots.

3. A plunger switch having a molded casing compris-
ing an external wall, a bore of varying cross-sectional
diameter longitudinally passing therethrough to create
openings at each end, a plurality of slots cut through
said wall extending into said bore, said slots having elec-
trical terminals therein, one end of said bore being closed
by means of a plunger, said plunger having a head portion
contained by a shoulder, a molded-snap fit cap at said
other end for closing the same, a molded resilient spring
integrally molded to said cap and said plunger head,
a metal shorting bar held in a section of said resilient
spring, said plunger moveable in said bore of said switch
so that said shorting bar engages said terminals in said
slots.

4. A plunger switch having a molded casing compris-
ing an external wall, a bore of varying cross-sectional
diameter longitudinally passing therethrough to create
openings at each end, a plurality of slots cut through
said wall extending into said bore, said slots having elec-
trical spade terminals locked into place by protuber-
ances in said slots, one end of said bore being closed by
means of a plunger, said plunger having a head portion
contained by a shoulder, a molded, snap fitted cap at
said other end for closing the same, a molded resilient
cooled spring integrally molded to said cap and said
plunger head, a metal shorting bar held by said coiled
spring, said plunger moveable in said bore of said switch
so that said shorting bar engages said spade terminals
in said slots.

5. A plunger switch having a molded casing compris-
ing an external wall, a bore of varying cross-sectional
diameter longitudinally passing therethrough to create
openings at each end, a plurality of molded slots having
protuberances cut through said wall extending into said
bore, said slots having electrical terminals held by the
protuberances therein, one end of said bore being closed
by means of a plunger, said plunger having a head portion
contained by a shoulder, a cap at said other end for
closing the same, molded lip extension on said
external wall allowing said cap to be snap fitted and con-
tained therein, a molded coiled spring integrally joined
to said cap and said plunger, said spring, said cap and
said plunger head being of a unitary construction, a metal
shorting bar held by said coiled spring, said plunger
moveable in said bore of said switch by compressing
said spring so that said shorting bar engages said terminals
in said slots.

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