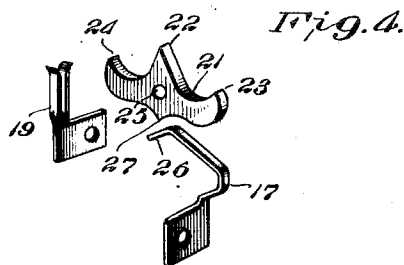
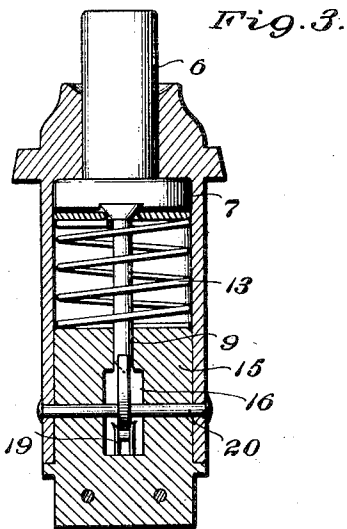
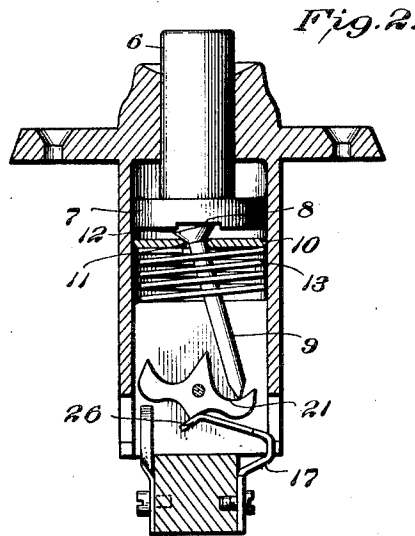
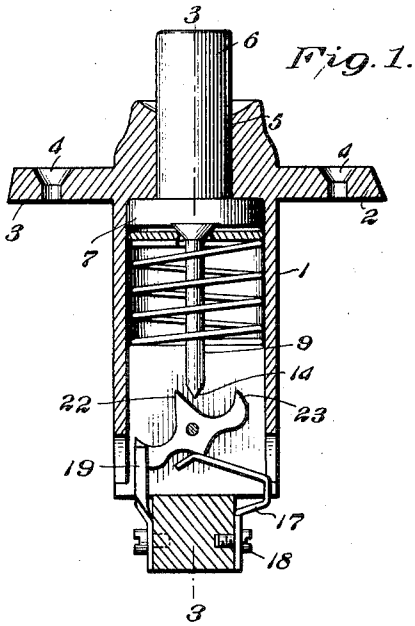


H. E. GRABAU.
 PUSH BUTTON ELECTRIC SWITCH.
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1,051,219.

Patented Jan. 21, 1913.



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HANS E. GRABAU, OF NEW YORK, N. Y.

PUSH-BUTTON ELECTRIC SWITCH.

1,051,219.

Specification of Letters Patent.

Patented Jan. 21, 1913.

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To all whom it may concern:

Be it known that I, HANS E. GRABAU, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Push-Button Electric Switches, of which the following is a specification.

It has been my purpose in the present invention to make in compact and convenient form an electric switch operated by a single push button. The structure is such that when the electric circuit is made a depression of the push button will operate the switch to break the circuit and when the circuit is broken a depression of the push button will close the circuit.

The novel features of the invention will be apparent from the following description taken in connection with the accompanying drawing.

In the drawing: Figure 1 is a cross section of a device embodying my invention and showing the parts in position when the circuit is closed, Fig. 2 is a similar view showing the position of the parts when the push button is depressed to break the circuit, Fig. 3 is a cross section on the line 3—3 of Fig. 1, and Fig. 4 is a detail perspective view of the contact points and switch separated.

As shown in the drawings I make use of a casing 1 which is preferably tubular in form and which is provided with the flanges or ears 2, 3 having therein the screw-holes 4 for the purpose of fastening the device in place. This casing may be made of any suitable material, but I prefer to make it of metal and of cylindrical form having at one end the cylindrical central opening 5 to receive the push button 6. The push button may be made of any suitable material, such as hard rubber or bone, and it has a cylindrical portion passing through the opening 5 and an enlarged inner base 7 fitting within the casing and serving as an abutment to limit the outward movement of the push button. The inner surface of this base at the center is provided with a depression or socket 8 of such shape as to receive the upper end or head of the pin 9. The pin 9 passes through a hole in the center of a plate 10 preferably made of metal and

freely movable longitudinally of the casing, the central hole 11 being of sufficient size to permit the pin to pass loosely through it and to be turned laterally, as indicated in Fig. 2. The head 12 of the pin rests on the wall of the hole 11 and a coiled spring 13 bearing upon the plate 10 around its edges tends to force it back against the push button. The head of the pin 9 is therefore clamped between the push button and the plate, the top of the head being flat the tendency will be to straighten the position of the pin so as to make it extend in line with the push button as shown in Fig. 1, this action being assisted by the inclined under surface of the head of the pin bearing in the hole in the plate. This pin is preferably made of brass and has a pointed lower end 14.

Fitting within the inner open end of the casing 1 there is a socket or base 15 preferably made of vulcanized rubber and having across its upper portion a transverse slot 16, as shown in Fig. 3. The lower opposite sides of this socket are cut away to receive on one side the curved spring contact member 17 which is held in place by the screw 18 and on the other side the forked contact member 19. A pivot pin 20 passes through the socket and the side walls of the casing holding the parts together and serving to pivotally support the switch 21 which is made of conducting metal. This switch member has centrally on its upper side an inverted V-shaped projection 22 and at opposite ends it has the upwardly projecting points 23, 24 serving as abutments for the pin 9 as hereinafter described. The pivot pin 20 passes through the central hole 25 and the contact spring 17 at its curved outer end 26 bears upon the under surface of the switch tending to hold it either open or closed. The spring 17 bears upon opposite sides of the central sharp projection 27 on the under surface of the switch, bearing upon one side when the switch is open and upon the other side when the switch is closed and serving to securely hold it either open or closed. When the switch is closed the end 24 passes down between the jaws of the contact point 19 and thus the switch 21 serves as the connection between the contact point 17 and the contact point 19.

It will be observed that the pin 9 when in

normal position, as shown in Fig. 1, extends down within the upper end of the slot 16 and fits in that slot loosely so that it can be turned to one side or the other along the slot.

- 5 When the switch is closed as shown in Fig. 1, the point of the pin is on the side of the point 22 next to the point 23, and therefore a depression of the push button will make the pin 9 pass down the side of the point 22
10 and turn the switch to the position shown in Fig. 2. If the button is then released the pin will be brought back into the position shown in Fig. 1, and it will therefore at that time be above the other side of the point 22.
15 A second depression of the button will therefore make the pin 9 engage the side of the switch which is provided with the point 24, and therefore the switch will be turned back into closed position as shown in Fig. 1. The
20 result is that successive operations of the push button successively turn the current on and off.

The structure is such that the device may be made in compact form included within
25 a small cylindrical casing which may be fastened in an ordinary hole bored in the wall or support where it is to be used.

Having thus described the invention, what is claimed is:

- 30 1. In a device of the class described, the combination with a casing, of a single push button therein accessible from the exterior, a plug of insulating material extending into one end of the casing, contact points on the
35 plug and extending into said casing, a movable switch pivoted on the insulated plug and adapted to electrically connect said contact points, said switch having electrical connection with one of said points at all
40 times, an extension loosely connected to said push button adapted to engage said switch to turn it into or out of closed position, means for yieldingly holding said extension and push button in normal operative position,
45 and the switch being so constructed that the point of connection between said extension and switch will be alternately shifted to alternately open or close said switch at successive depressions.

- 50 2. In a switch of the class described, the combination with a casing, of a single push button therein accessible from the exterior, means yieldingly supporting said push button, terminals and contact points within said
55 casing, including a spring contact finger integral with one of the terminals, a movable switch plate adapted to electrically connect the said contact points, said switch plate having permanent electrical connection with
60 said spring contact finger, and means loosely connected with the push button and operated by the depression of said push button for moving said switch plate into closed or open position successively.

3. In a switch of the class described, the
65 combination with a casing, of a single push button projecting to the exterior of said casing at one end and provided with an enlarged base limiting the outward movement of the push button, a body of insulating
70 material fitting in the other end of said casing, switch terminals mounted on said insulating body, a switch plate, means operated by the depression of said push button for moving said switch plate to closed and open
75 position successively, and resilient means seating on said insulating body for normally and yieldingly maintaining said push button in projected position.

4. The combination with a tubular casing,
80 of a push button projecting through one end of said casing and provided with an enlarged inner base, a plug of insulating material extending into the other end of the casing, a movable plate fitting within said
85 casing against the inner surface of said base and provided with a central hole, a pin loosely passing through said hole provided with a head having a flat top and rounded sides fitting against the walls of said hole,
90 and a coiled spring within said casing seated on said plug and bearing outwardly against said plate.

5. The combination with a tubular casing,
95 of a push button projecting through one end of said casing and provided with an enlarged inner base, a movable plate fitting within said casing against the inner surface of said base and provided with a central hole, a pin loosely passing through said hole
100 provided with a head having a flat top and rounded sides fitting against the walls of said hole, and a coiled spring within said casing bearing outwardly against said plate, an insulating plug in said casing below said
105 spring having a slot across its top in which said pin works, contact points at opposite ends of said slot, and a switch member pivoted in said slot and adapted to be turned by said pin to open or closed position.
110

6. In a device of the class described, the combination with a tubular casing, of an insulating plug at one end provided with a slot in its inner end, contact points extending into said slot at opposite ends, a pivoted
115 switch member mounted in said slot adapted to connect and disconnect said contact points, and yielding means extending down through and guided by said slot for alternately turning said switch into open or
120 closed position.

7. In a device of the class described, the combination with a tubular casing, of an insulating plug extending into one end and provided with a slot in its inner end, a
125 switch member in the form of a plate centrally pivoted in said slot and provided on its upper surface with depressions on oppo-

site sides of the pivot separated by an upwardly projecting wedge shaped point, contact points adapted to be engaged by said member when turned in one position, and a yielding loosely supported pin centrally above said member extending into said slot adapted to be moved longitudinally to turn said switch.

8. In a switch of the class described, the combination with a casing, of a single push button fitting in one end of the casing, said push button normally protruding from the casing at one end, a body of insulating material fitting in the other end of the casing, said insulating body having a slot therein, means bearing on the insulating body and yieldingly holding said push button in normal protruding position, terminals on the insulating body, a switch member pivoted in the slot within the insulating body, and means operatively connected with the push button for successively opening and closing the switch upon successive depressions of the button.

9. In a device of the class described, the combination of a tubular casing, a single push button fitting in one end of the casing, a plug of insulating material fitting in the other end of the casing, said plug having a transverse slot therein, terminals secured to opposite sides of the plug and extending into the slot, a switch member pivoted in the slot within the plug, a pin loosely connected to the push button extending down into the slot and guided thereby, said pin adapted to engage the switch member to successively open and close the switch upon successive operations of the button and means for holding the pin in engagement with the push button.

10. In a device of the class described, the combination of a tubular casing, a single push button fitting in one end of the casing, a plug of insulating material fitting in the other end of the casing, said plug having a transverse slot therein, a forked contact member secured to one side of the plug and extending into said slot, a spring contact member secured to the plug opposite said forked contact and extending into the slot, a switch member pivoted in the slot within the plug and at all times in engagement with the spring contact member and means operatively connected to the push button extending down into the slot and guided thereby to engage the switch member to open and close the latter upon successive operations of the button.

11. In a switching mechanism of the class described, the combination of a tubular casing having a flange intermediate its ends, a single push button provided with an enlarged base fitting in one end of the casing, a plug of insulating material fitting in the

other end of the casing, said plug having a transverse slot therein, a forked contact member secured to one side of the plug and extending into said slot, a spring contact member secured to the plug opposite said forked contact and extending into the slot, a switch member pivoted in the slot within the plug and at all times in engagement with the spring contact member, a pin loosely connected to the base of the push button extending down into the slot and guided by the latter, said pin adapted to engage and oscillate the switch member to successively open and close the latter upon successive operations of the button and a resilient member seated on the plug to return the push button and pin to normal position after successive depressions of the button.

12. In a switch of the class described, the combination of a tubular casing of uniform internal diameter, a push button projecting through one end of said casing and provided with an enlarged inner base substantially the diameter of the interior of the casing, a plug of insulating material formed to fit snugly into the other end of said tubular casing, said plug having a transverse slot therein, a pin connected to move said push button, the end of said pin moving in said slot and guided thereby, switch contacts mounted on the plug and extending into the slot, a bridging member pivoted in the slot and adapted to be oscillated by said pin upon successive depressions of the push button to alternately open and close the switch.

13. In a switch of the class described, the combination with a tubular casing, of a push button projecting through one end of said casing and provided with a central recess, a body of insulating material extending into the other end of said tubular casing and having a transverse slot therein, a pin having the head thereof movably seated in the recess in the push button, and the shank thereof longitudinally movable in the slot in said insulating body, a yieldable member bearing against the lower side of the head of said pin and having a hole therein through which said shank of the pin passes, switch terminals extending into the slot in said insulating body, and a bridging member pivotally mounted in the slot in said insulating body and adapted to be engaged and oscillated by the shank of said pin upon successive depressions of the push button to alternately open and close the switch.

14. In a switch of the class described, the combination with a tubular casing of uniform internal and external diameter, of a single push button therein and normally projecting through one end of said casing, the inner end of said push button being of substantially the diameter of the interior of the casing, a body of insulating material

fitting snugly into the other end of the casing and having a transverse slot therein, contact points on the insulating body and extending into the slot, a movable switch plate
5 pivoted in the slot in the insulating body and adapted to electrically connect said contact points, an extension loosely connected to said push button and adapted to engage the switch plate and turn it into or out of

closed position, and means for yieldingly holding said extension and push button in normally operative position.

In testimony whereof I affix my signature in presence of two witnesses.

HANS E. GRABAU.

Witnesses:

JOSEPH F. O'BRIEN,
OSCAR HAPAUSSON.