

J. F. CAVANAGH.
ELECTRIC SWITCH.
APPLICATION FILED OCT. 25, 1918.

1,315,466.

Patented Sept. 9, 1919.

Fig. 1.

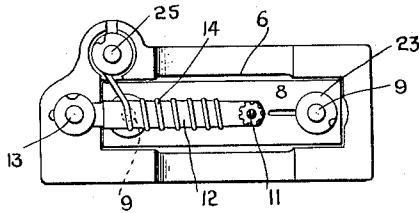


Fig. 2.

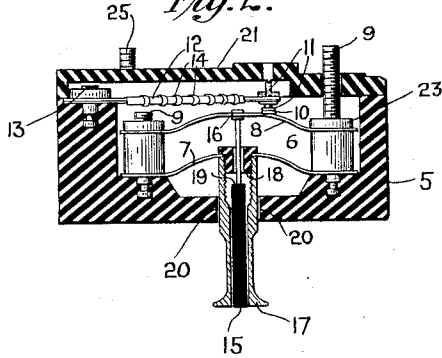


Fig. 3.

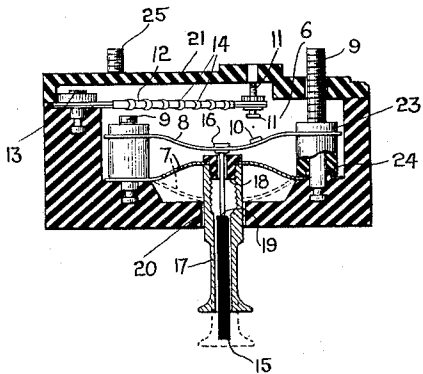
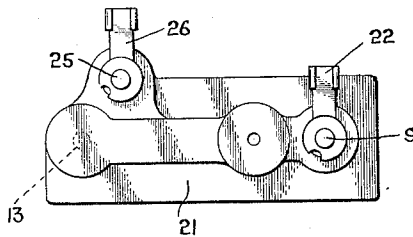


Fig. 4.



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ELECTRIC SWITCH.

1,315,466.

Specification of Letters Patent.

Patented Sept. 9, 1919.

Application filed October 25, 1918. Serial No. 259,635.

To all whom it may concern:

Be it known that I, JOHN F. CAVANAGH, a citizen of the United States of America, residing at Meriden, Connecticut, have invented a new and useful Electric Switch, of which the following is a specification.

My present invention relates to switches of the "buckling" spring type wherein the action of the switch is obtained by snapping a buckling spring in opposite directions or to opposite sides of an imaginary center line.

The objects of the invention are to provide a practical and efficient form of combined manually and thermostatically operable switch utilizing the buckling spring principle.

My invention aims also to provide a switch of this type which will give visual indication of the thermostatic operation thereof.

With the foregoing in view the invention may be said to reside in the combination of a pair of buckling springs, with electric contacts controlled by one of said springs, means for normally buckling both the springs in both directions but particularly in one direction, and a thermostatic device for buckling the contact controlling spring in the reverse direction and independently of the other spring. Separate actuating devices, usually in the nature of push buttons are preferably provided for buckling the springs and indication of the thermostatic operation is usually provided for by constructing the parts so that the push button of the circuit controlling spring will stand out from the other push button when said spring has been actuated.

Other features of the invention will appear as the specification proceeds.

In the accompanying drawing I have illustrated the invention embodied in a practical preferred form but I would have it understood that changes and modifications may be made without departure from the true spirit and scope of the invention.

In said drawing:—

Figure 1, is a top view of the switch with the cover removed.

Fig. 2, is a longitudinal sectional view of the switch in normal circuit-closed position.

Fig. 3, is a similar view showing the contact controlling spring as having been actuated by the thermostat. This view also

shows in dotted lines the withdrawn position of the main push button,

Fig. 4, is a plan view of the switch with the cover in place.

The body of the switch is shown in the form of a base 5 of insulating material made substantially hollow to provide a chamber 6 for the switch mechanism.

The buckling springs are designated 7 and 8 and are shown in the form of strips of flat spring material disposed in side by side or substantially parallel relation within the switch base and confined in their arched or bowed shape by their engagement on the studs 9 in the opposite side walls of the chamber, which studs thus form abutments for the springs.

The outer spring 8 may be termed the circuit controlling spring, carrying as it does the contact 10 for cooperation with and engagement by a contact 11 of the thermostat bar 12, which bar is suitably mounted on the base as indicated at 13. This thermostatic bar is heated by a coil 14 wrapped about the same and as it becomes heated it assumes a warped or curved position, pressing toward the spring and finally buckling the spring and interrupting the circuit between the contact points 10 and 11, as shown in Fig. 3.

The circuit controlling spring is buckled in the reverse direction, to establish the circuit by means of an actuating device consisting in the present disclosure of a push button 15 connected with the spring by a loose joint such as indicated at 16.

The other buckling spring acts, in the present disclosure, simply as a power spring and is operated entirely by a separate actuating device or push button 17.

Simultaneous operation of both the buckling springs in a circuit-closing direction is provided for by making the push button 17 tubular in form and extending the shank of the other push button 15, through such tubular button and with its operating head exposed at the outer face or operating head of the tubular button. The operating heads of the two buttons are thus in fact superposed so that both will be simultaneously operated by the finger of the operator. The first push button however slides freely within the tubular button so that the thermostat is free to operate the

circuit controlling spring while the main push button remains in the "on" position. Such a condition is illustrated in Fig. 3. This is a particularly valuable feature where the switch is employed in ignition systems because of the fact that it gives actual visual indication to the operator that the thermostat has operated as it should and has automatically interrupted the ignition circuit.

To interrupt the circuit manually, the operator simply pulls on the main push button 17, the cooperating shoulders 18, 19 on the two buttons engaging under such action to cause the main button to "pick up" and carry with it the inner push button, both the springs buckling under these circumstances to the "off" circuit position.

The main push button may be guided in its movements by having a sliding engagement in the back or rear wall of the base, as indicated at 20. The hollow base construction, it will be noted, provides a housing for protecting practically all the working parts of the switch.

The switch parts will preferably be protected by a cover such as indicated at 21 which closes the open front of the hollow base. The stud or post 9 at the right hand end of the switch, is shown as extended through this cover and utilized as a terminal, it being shown in Fig. 4 as having a wire terminal clip 22 applied thereto. The contact controlling spring is in electrical contact with this post 9 by means of the lock nut 23. The power spring 7 on the other hand may be insulated from the post by means of an insulating shoulder or washer such as indicated at 24. The other terminal of the switch is provided by a post 25 extended up through the cover and having in Fig. 4 a terminal clip 26 applied thereto. This terminal post, as shown in Fig. 1 is directly connected with the strip or ribbon of the heating coil 14, the other end of this coil being grounded on the thermostat bar, as customary in such devices. The two push buttons are preferably insulated, one from the other, as by constructing the inner push button of insulating material and having it work loosely through the end of the other push button, as indicated.

I claim—

1. An electric switch comprising a pair of independently operating buckling springs, means for buckling both the springs, electric contacts controlled by one spring, and means for buckling said contact controlling spring independently of the other spring.

2. An electric switch comprising a pair of independently operating buckling springs, means for buckling both the springs, electric contacts controlled by one spring, and thermostatic means for buckling said con-

tact controlling spring independently of the other spring.

3. An electric switch comprising a pair of buckling springs, electric contacts controlled by one of said springs, a separate actuating device for each spring, and means for coupling said actuating devices together to cause the movement of one actuating device in one direction to simultaneously operate the other actuating device.

4. An electric switch comprising a pair of buckling springs, electric contacts controlled by one of said springs, a separate actuating device for each spring, means for coupling said actuating devices together to cause the movement of one actuating device in one direction to simultaneously operate the other actuating device, and independent means for operating the contact controlling spring independently of the other spring.

5. An electric switch comprising a pair of buckling springs, electric contacts controlled by one of said springs, a separate push button for each spring movable independently in one direction, and means for coupling said push buttons together to cause the movement of one push button in the opposite direction to actuate the other push button.

6. An electric switch comprising a pair of buckling springs, electric contacts controlled by one of said springs, a separate push button for each spring movable independently in one direction, means for coupling said push buttons together to cause the movement of one push button in the opposite direction to actuate the other push button, and thermostatic means for operating the contact controlling spring independently of the push button control.

7. An electric switch comprising a pair of buckling springs, electric contacts controlled by one of said springs, a separate push button for each spring movable independently in one direction, means for coupling said push buttons together to cause the movement of one push button in the opposite direction to actuate the other push button, said push buttons working one with the other to enable simultaneous operation of both push buttons by a single movement.

8. An electric switch comprising a pair of buckling springs, electric contacts controlled by one of said springs, a separate push button for each spring movable independently in one direction, means for coupling said push buttons together to cause the movement of one push button in the opposite direction to actuate the other push button, said push buttons having closely related operating heads disposed in position to be both actuated by one finger.

9. An electric switch comprising a pair of

buckling springs, a tubular push button connected with one of said springs for operating the same in both directions, a push button connected with the other spring and working within the tubular push button, co-operating shoulders on the two push buttons to cause the tubular push button in its movement in one direction to pick up and actuate the inner push button, and electric contacts controlled by one of the buckling springs.

10. An electric switch comprising a pair of buckling springs, a tubular push button connected with one of said springs for operating the same in both directions, a push button connected with the other spring and working within the tubular push button, co-operating shoulders on the two push buttons to cause the tubular push button in its movement in one direction to pick up and actuate the inner push button, electric contacts controlled by the second buckling spring, and a thermostat for actuating said second buckling spring independently of the push button connected therewith.

11. An electric switch comprising a pair of buckling springs, electric contacts controlled by one of said springs, an actuating device connected with the other spring, an actuating device connected with the contact controlling spring having a portion arranged to protrude beyond the first actuating device, and means for actuating the contact controlling spring to cause said second actuating device to protrude beyond the first actuating device.

12. In an electric switch, the combination of electric contacts, a contact controlling buckling spring, a thermostat for buckling said spring in one direction, a push button for buckling said spring in the opposite direction, a power buckling spring, a push button for operating said power spring in both directions, and a connection between the two push buttons for causing the second

push button in its movement in one direction to snap the contact controlling spring in a direction similar to the movement imparted thereto by the thermostat.

13. In an electric switch, a hollow base, buckling springs mounted within said hollow base, contacts within the base controlled by one of said springs, and separate actuating devices for the springs extending through the hollow base into engagement with the springs therein.

14. In a device of the character described, a pair of buckling springs and a pair of push buttons connected with said springs and working one within the other to indicate by their relative positions the condition of the buckling springs.

15. In a switch of the character described, a manually operated buckling spring and a thermostatically operated buckling spring and push buttons independently connected with said buckling springs and working one within the other to provide visual indication of the operation of the thermostatically operated buckling spring independently of the manually operated buckling spring.

16. In a switch of the character described, a buckling spring, a thermostat for buckling said spring in one direction, a push button for returning the spring into engagement with the thermostat and a tubular push button within which said first push button operates, said two push buttons being insulated one from the other.

17. In a switch of the character described, the combination of a circuit controlling buckling spring, a thermostat having connection with said spring for buckling the same in one direction only and a manually operable push button having connection with said buckling spring for buckling the same in the reverse direction to thereby restore said buckling spring into position under the control of the thermostat.

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