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SNAP ACTION MECHANISM FOR OPERATING ELECTRIC SWITCHES

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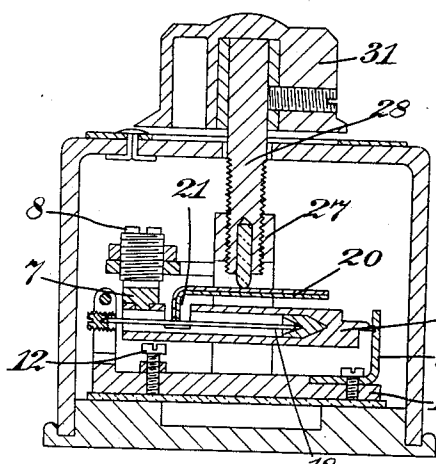


Fig. 2.

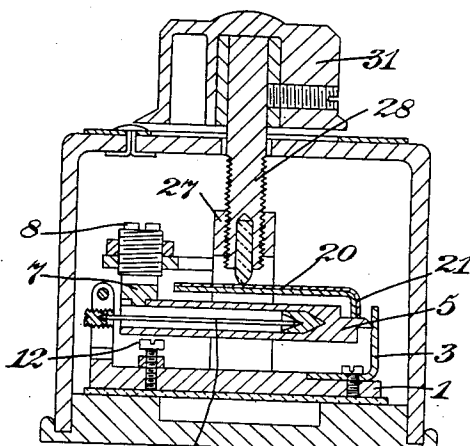


Fig. 3.

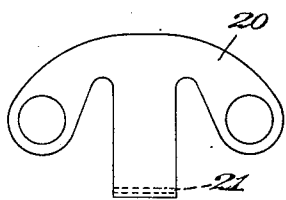


Fig. 1.

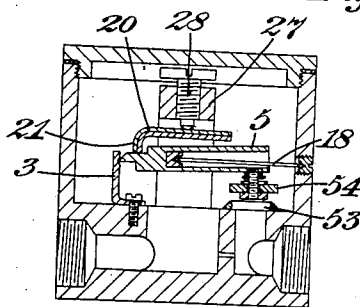


Fig. 4.

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SNAP ACTION MECHANISM FOR OPERATING ELECTRIC SWITCHES

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In Great Britain October 17, 1935

11 Claims. (Cl. 200—138)

This invention relates to snap action mechanism for operating electric switches, valves, or the like, and is an improvement in or a modification of the invention described and claimed in the specification of my application No. 46,200 filed 22nd October, 1935.

According to the present invention, the resilient means described in the above mentioned specification which applies the lateral pressure to the operative member is formed as a bimetallic element and itself constitutes the thermally sensitive member.

The invention also consists in a thermostat or thermostatically operated switch, valve or the like, as described in the above mentioned specification, in which the spring member and its depending tongue which makes contact with the strut member or the operating member is made as a bimetallic strip and itself forms the thermally sensitive member.

One form of the invention will now be described by way of example with reference to the accompanying drawing, in which:—

Figure 1 is a plan of the thermally sensitive element.

Figure 2 is a sectional elevation of one form of a thermostatically operated electric switch.

Figure 3 is a sectional elevation of another form of a thermostatically operated electric switch.

Figure 4 is a sectional elevation of a thermostatically operated gas valve.

In carrying the invention into effect according to the form as shown in Figures 1 and 2 of the drawing as applied to a thermostatically controlled switch as illustrated in Figure 1 of application No. 46,200, filed 22nd October, 1935, the spring member 20 and its depending tongue 21, which presses against the strut member 18 is made of two metals joined together in any known manner so as to form a bimetallic thermally sensitive member. The two metals of the bimetallic member 20 are so arranged that on heating up additional pressure is applied laterally to the strut member 18 so as to cause the contacts 7 and 8 to snap apart. Arrangements may be made to heat the bimetallic member by passing current directly through it, or it can be arranged to be heated by the air in a room or the like. Or again, a separate heating element or the like may be situated close to or around the thermally sensitive member to heat it for controlling the contacts on the operating member.

According to the form shown in Figure 3, as applied to the form shown in Figure 3 of application No. 46,200 filed 22nd October, 1935, the bi-

metallic member 20 is made to press upon the strut member 5 near the bracket 3, which gives a very simple and effective construction.

An arrangement is shown in Figure 4 of the invention applied to a gas valve, as shown in Figure 10 of application No. 46,200, filed 22nd October, 1935, in which the tongue 21 presses on the operating member 5 on which the valve 54 is mounted which closes the opening 53.

The adjusting screw 28 with its handle 31 is provided and is screwed into the yoke 27 or other suitable means fixed to the base 1 of the device in all the modifications shown.

If desired, the bimetallic member 20 may be made to decrease its pressure when heated so that the operating member may be moved to close the contacts.

The switch made according to the present invention can be used as a thermostat or as a delay action switch mechanism for working other devices, such as traffic signals, overloads, safety switches or the like, the current passing through the thermally sensitive member or through the separate heater, as desired. In a delay action switch the time it takes to heat up the bimetallic element to operate the switch is so adjusted as to give the required delay in the action.

Additional contacts may be made below the usual contacts in place of the stop 12 which limits the travel of the operating member. If desired, the bimetallic thermally sensitive member may be applied to the type of switch which does not automatically return to its original position but when operated by the thermally sensitive member remains in the tripped position, as shown in Figure 9 of the specification of our application No. 46,200, filed 22nd October, 1935, and has to be reset by other means.

It is to be understood that arrangements of parts and construction of details may be made other than those described according to requirements without departing from the scope of the invention.

I claim:

1. A snap action make and break mechanism comprising in combination a body, an operating member pivoted at one end to said body, a member at the other end of said body, with which the other end of said operating member makes contact, a member pivotally supported at one end on said body and at the other end on said operating member applying a resilient turning moment to said operating member in one direction, and a resilient bimetallic member mounted upon said body adapted to apply a force which creates

a turning moment which is applied in the opposite direction to said operating member, movement of said operating member taking place when one turning moment overbalances the other turning moment, and the snap action being due to the overbalanced turning moment decreasing more rapidly than the other turning moment and taking place before the said operating member reaches the dead centre or neutral position.

2. A snap action make and break short gap mechanism, comprising in combination, a body, two upstanding supports on said body, an operating member pivotally supported at one end on one of said supports, a floating member pivotally supported upon said operating member and said other support applying a resilient turning moment in one direction, a member on said body, a member on said operating member contacting with said body member, and a resilient bimetallic member mounted upon said body adapted to apply a force which creates a turning moment which is applied in the opposite direction to said operating member, said snap action taking place before the said operating member reaches the dead centre or neutral position.

3. A snap action make and break mechanism comprising in combination a body, a non-resilient operating member pivoted at one end to said body, a member at the other end of said body, with which the other end of said operating member makes contact, a member pivotally supported at one end on said body and at the other end on said operating member applying a resilient turning moment to said operating member in one direction, a bimetallic member for applying a resilient force to said operating member to create a turning moment in the opposite direction, movement of said operating member taking place when one turning moment overbalances the other turning moment, the snap action being due to the overbalanced turning moment decreasing more rapidly than the other turning moment, and means to prevent said operating member passing through the dead centre or neutral position.

4. A snap action make and break short gap mechanism, comprising in combination, a body, two upstanding supports on said body, a non-resilient operating member pivotally supported at one end on one of said supports, a floating member pivotally supported upon said operating member and said other support applying a resilient turning moment in one direction, a member on said body, a member on said operating member contacting with said body member, means for preventing said operating member passing through dead centre or neutral position when the contacting members are opened and a resilient bimetallic member mounted upon said body and pressing upon said operating member applying a turning moment in the opposite direction.

5. A snap action make and break short gap thermostatic switch, comprising in combination, a body, two upstanding supports on said body, a non-resilient operating member pivotally supported at one end on one of said supports, a floating member pivotally supported upon said operating member and said other support applying a resilient turning moment in one direction, a contact on said body, a contact on said operating member engaging with said body contact, means for preventing said operating member passing through dead centre or neutral position when the contacts are opened and a resilient bimetallic member mounted upon said body and pressing

upon said floating member applying a turning moment in the opposite direction.

6. A snap action make and break short gap thermostatic switch comprising in combination, a body, two upstanding supports on said body, a non-resilient operating member pivotally supported at one end on one of said supports, a floating member pivotally supported upon said operating member and said other support applying a resilient turning moment in one direction, a contact on said body, a contact on said operating member engaging with said body contact, means for preventing said operating member passing through dead centre or neutral position when the contacts are opened and a resilient bimetallic member mounted upon said body and pressing upon said operating member applying a turning moment in the opposite direction.

7. A snap action make and break short gap switch comprising in combination a body, two upstanding supports on said body, a non-resilient operating member pivotally supported at one end on one of said supports, a floating member pivotally supported upon said operating member and said other support applying a resilient turning moment in one direction to said operating member, means for adjusting the end pressure on said floating member, a contact on said body, a contact on said operating member engaging with said body contact, means for preventing said operating member passing through dead centre or neutral position when the contacts are opened and a resilient bimetallic member mounted upon said body and pressing upon said operating member applying a turning moment in the opposite direction.

8. A snap action make and break short gap thermostatic switch comprising in combination, a body, two upstanding supports on said body, a non-resilient operating member pivotally supported at one end on one of said supports, a floating member pivotally supported upon said operating member and said other support applying a resilient turning moment in one direction, a contact on said body, a contact on said operating member engaging with said body contact, means for preventing said operating member passing through dead centre or neutral position when the contacts are opened and a resilient bimetallic member mounted upon said body and pressing upon said floating member applying a turning moment in the opposite direction.

9. A snap action make and break short gap switch comprising in combination, a body, two upstanding supports on said body, a non-resilient operating member pivotally supported at one end on one of said supports, a floating member pivotally supported upon said operating member and said other support applying a resilient turning moment in one direction, means for adjusting the end pressure on said floating member, a contact on said body, a contact on said operating member engaging with said body contact, means for preventing said operating member passing through dead centre or neutral position when the contacts are opened and a resilient bimetallic member mounted upon said body and pressing upon said floating member applying a turning moment in the opposite direction.

10. A snap action make and break short gap switch comprising in combination, a body, two upstanding supports on said body, a V groove in one support, a cup-shaped bearing in the other said support, a non-resilient operating member,

a knife edge on said operating member engaging said V groove on said support, a cup-shaped bearing on said operating member, a floating member supported in said cup bearings on the support and operating member respectively, said floating member applying a resilient turning moment in one direction to said operating member, means for adjusting the force exerted by said floating member upon said operating member, a contact on a portion of said operating member remote from the two bearings, a contact on said body adapted to be engaged by said contact on said operating member, a stop to limit the gap between the contacts and to prevent the operating member from passing through dead centre or neutral position, and a resilient bimetallic member mounted upon said body to press upon said operating member for applying a turning moment in the opposite direction.

11. A snap action make and break short gap switch comprising in combination, a body, two upstanding supports on said body, a V groove

in one support, a cup-shaped bearing in the other said support, a non-resilient operating member, a knife edge on said operating member engaging said V groove on said support, a cup-shaped bearing on said operating member, a floating member supported in said cup bearings on the support and operating member respectively, said floating member applying a resilient turning moment in one direction to said operating member, means for adjusting the force exerted by said floating member upon said operating member, a contact on a portion of said operating member remote from the two bearings, a contact on said body adapted to be engaged by said contact on said operating member, a stop to limit the gap between the contacts and to prevent the operating member from passing through dead centre or neutral position and a resilient bimetallic member mounted upon said body to press upon said floating member for applying a turning moment in the opposite direction.

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