Oct. 6, 1931. G. J. ZISCH 1,826,488

THERMOSTATIC SWITCH

Filed April 20, 1928

Fig. 1.

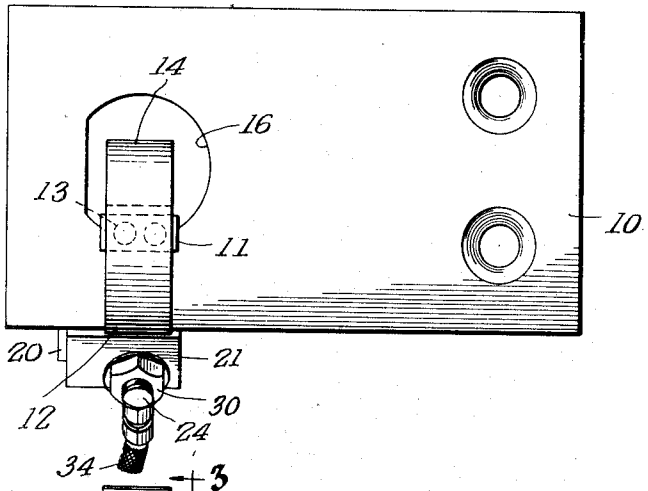


Fig. 2.

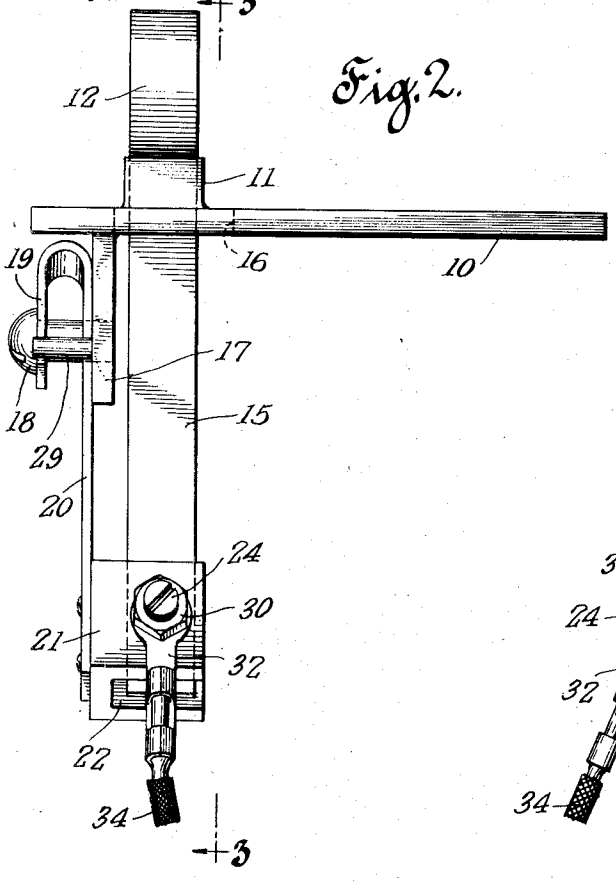
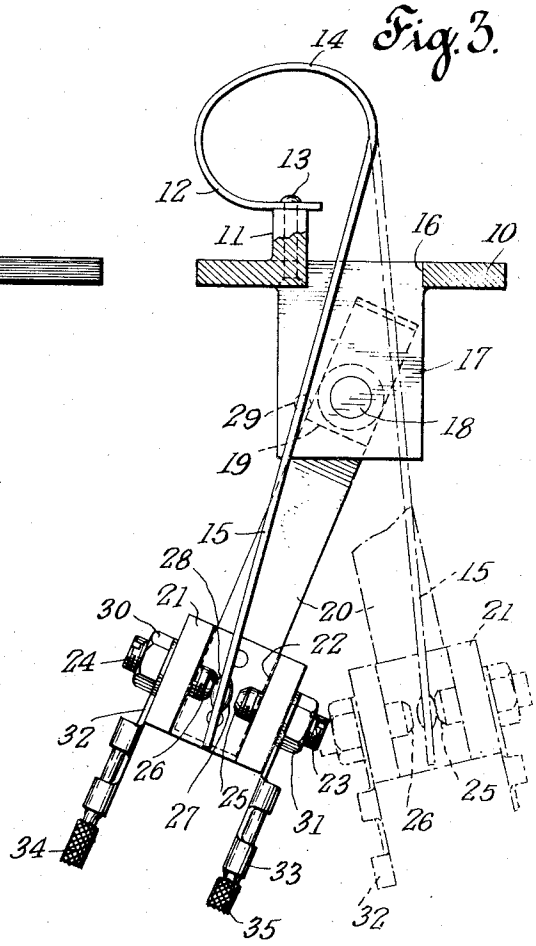


Fig. 3.



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THERMOSTATIC SWITCH

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This invention relates to thermostatic control devices in which a thermal bar subjected to changes in temperature, is utilized to open and close an electric circuit, and also for a wide variety of other purposes, including the control of heating and refrigerating systems.

Various types of similar devices are well known and of common occurrence; with few exceptions however they are subject to the disadvantage of being sluggish in their action, particularly in reversing or changing from one position to another.

Another objectionable feature resides in the multiplicity of parts, often quite complicated, and the necessity of making adjustments from time to time in such structures.

It is therefore an object of the present invention to provide a form of thermal change control that is substantially instantaneous in its operation.

A further feature is in the provision of an essentially simple device, composed of a minimum number of parts, which require no adjustment after installation.

Another aim is to produce a thermostatic control switch that is positive and dependable in action, capable of changing its position from one contact to the other in the shortest posisble time at various degrees of heat, and which is capable of long and continuous service without supervision or attention.

These important results are accomplished by the novel and practical construction and arrangement of parts, as hereinafter described and shown in the accompanying drawings, constituting a material part of this disclosure, and in which:—

Figure 1 is a rear plan view of an embodiment of the invention.

Figure 2 is a side elevational view of the same.

Figure 3 is a transverse sectional view taken on line 3—3 of Figure 2.

The device, as shown, consists of a plate base, generally designated by the numeral 10, adapted to be disposed in a position so that one side is exposed to the effect of thermal changes, the other, front side, carrying such electrical attachments as are desired.

Extending rearwardly from the base 10 is a lug 11 to which is attached one end of a thermostatic bar 12 rigidly held in place, as by rivets 13, the bar being formed into a curved portion 14 extending into a zone subjected to changes of temperature, and then continued straight towards the front, as at 15, passing through an opening 16 in the base in which the portion 15 of the bar is free to oscillate.

On the front of the base, below the opening 16, is a plate lug 17 having set in its center a pivot screw 18, passing through a reentrantly bent spring 19 formed on a flat metal arm 20 pivotally mounted on the screw 18 and held by the tension of the spring under adjustable restraint.

Carried at the outer end of the arm 20, on its under side, is a dielectric channelled block 21 into the recess 22 of which the outer end of the thermostatic bar 15 extends.

Set in the side walls of the recess are screws 23—24, the points of these screws having silver, platinum or like highly conductive tips 25—26 arranged to electrically engage similar contacts 27—28, carried near the end of the bar 15 and with which the tips are in close proximity.

As may be seen in Figure 3, the thermostatic bar 15 is arranged so that its normal position is such that the contact 28 is in engagement with the tip 26 and the arm 20 is swung to its ultimate angular position, towards the left, this position being determined by its physical contact with a stop pin 29 set in the plate lug 17.

Obviously upon the transmission of heat to the bar element 14, the member 15 will move towards the right, breaking the mentioned contact and instantly the contact 27 will engage the tip 25 and the further accession of heat to the thermostatic bar will result in turning the arm 20 upon its pivot to the right, as indicated by the broken lines in Figure 3.

Clamp nuts 30—31 on the outwardly extending ends of the screws 24—25 serve as binders for conductor clips 32—33 in which are secured cables 34—35 so that either may

be placed in circuit by action of the bar 15, which constitutes a ground connection for the cables.

It will be understood that the effect of heat upon the thermal element is almost instantaneous, and as the free end of the bar has only to move a fraction of an inch, in practice approximately three-hundredths of an inch, this action is extremely rapid and positive.

It is equally evident that the thermal element upon cooling, even a few degrees, will at once move towards its initial position, that is in contact with the tip 26, not being constrained in any way due to the free movement of the arm 20, the change taking place very rapidly from one tip to the other, in actual practice ten to fifteen seconds of time being consumed.

The application of the switch is of wide scope, its use being indicated in connection with gas and oil burners and particularly where rapid and positive control is desirable.

From the foregoing it will be seen that a simple device for this purpose has been disclosed in the preferred form of its embodiment, but it is not desired to restrict the details to the exact construction shown, it being obvious that changes, not involving the exercise of invention, may be made without conflicting with the scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to secure by Letters Patent, is:—

1. A thermostatic switch comprising a conductive base having an opening, a thermal element anchored to said base, its free portion extending freely through the mentioned opening, an arm pivoted on said base to extend in spaced relation parallel to said element, and a pair of insulated contacts rigid on the free end of said arm, either of said contacts engaging said element upon movement thereof to form electrical engagement whereby said arm may be swung upon its pivot.

2. A thermostatic switch comprising a base, an arm yieldingly mounted thereon, a pair of opposed electric contacts carried in close relation by the free end of said arm and insulated therefrom, a thermal element anchored on the opposite side of said base and curved to extend through an opening therein, the free end of said element normally engaging one of said contacts and being slightly spaced from the other contact to make electrical engagement therewith when the element is subjected to heat, a stop for said arm when in its initial position, and a frictional braking means for said arm when swung from said stop by said element.

3. A thermostatic switch comprising a conductive base having a thermal element in electric engagement therewith, a portion of said element extending into a zone subject to changes of temperature and another portion free to move laterally, an arm pivoted to said base to swing in a plane parallel with said element, insulated contacts carried at the free end of said arm engageable with said element in accordance with its movement, said arm being turned by such contact on its pivot, and electrical connections engaged with said contacts.

4. A thermostatic switch comprising a base, a single unitary arm yieldingly mounted thereon, a pair of opposed electric contacts carried in close relation by the free end of said arm and insulated therefrom, and a thermal element anchored on the opposite side of said base and curved to extend through an opening therein, the free end of said element normally engaging one of said contacts and being slightly spaced from the other contact to make electric engagement therewith when the element is subjected to heat.

5. A thermostatic switch comprising a base, an arm yieldingly mounted thereon, a pair of opposed electric contacts carried in close relation by the free end of said arm and insulated therefrom, a thermal element anchored on the opposite side of said base and curved to extend through an opening therein, the free end of said element normally engaging one of said contacts and being slightly spaced from the other contact to make electric engagement therewith when the element is subjected to heat, and a stop for said arm when in its initial position.

6. A thermostatic switch comprising a conductive base having a thermal element in electric engagement therewith, a portion of said element extending into a zone subject to changes of temperature and another portion free to move laterally, an arm pivoted to said base to swing in a plane parallel with said element, means associated with said pivot to retain the arm in adjustment, insulated contacts carried at the free end of said arm engageable with said element in accordance with its movement, said arm being turned by such contact on its pivot, and electrical connections engaged with said contacts.

7. A thermostatic switch comprising a base, a thermostatic element mounted thereon having a portion extending into a zone of heat and another portion movable through the base, a lug on said base, a unitary arm pivoted to said lug to oscillate in a plane parallel and contiguous to the movable portion of said element, opposed contacts rigid with the free end of said arm, and contacts on the free end of said element to engage said opposed contacts upon movement of said element laterally in either direction.

8. A thermostatic switch comprising a conductive base having an opening, a thermal element anchored to said base, its free portion extending freely through the mentioned opening, a unitary arm pivoted on said base

to extend in spaced relation parallel to said element, a pair of insulated contacts rigid on the free end of said arm, means to adjust said contacts relative to said element to engage the same upon relative movement, a frictional brake on said arm and electrical connections for said contacts.

In testimony whereof I affix my signature.

GEORGE J. ZISCH.