May 15, 1934. J. A. SPENCER 1,958,594

THERMOSTAT

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Fig. 1.

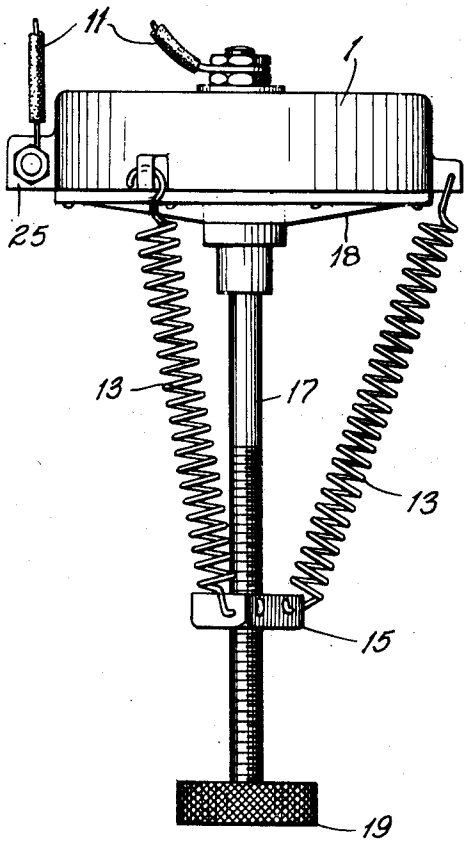


Fig. 3.

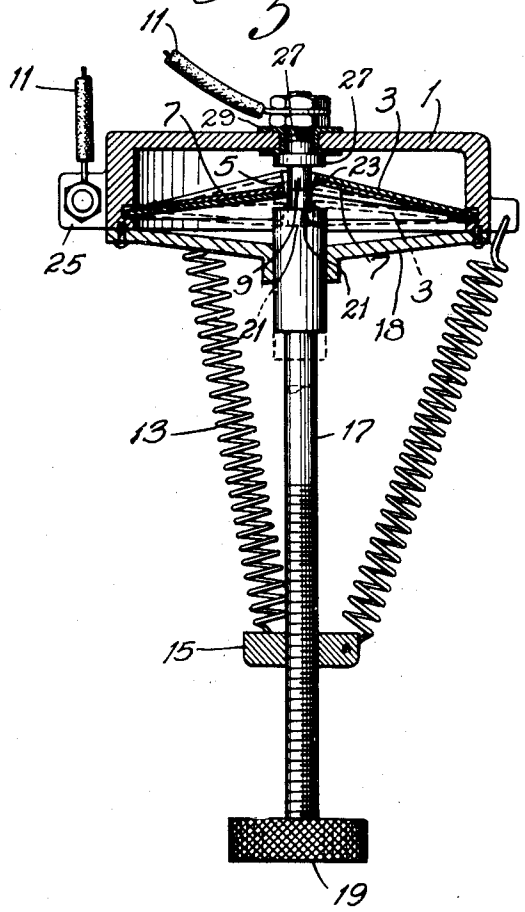
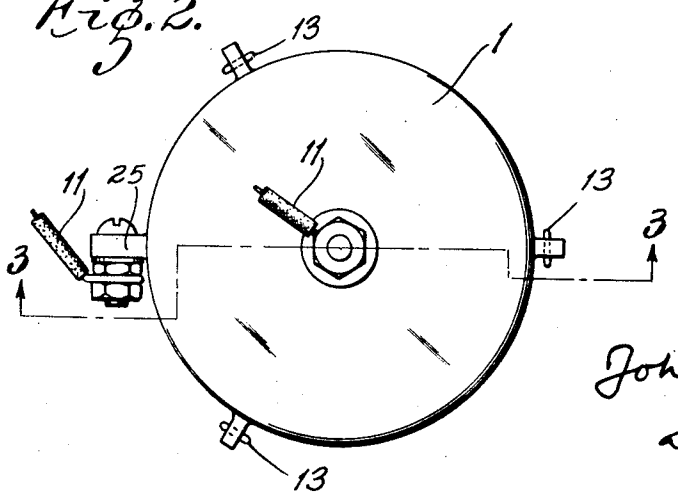


Fig. 2.



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THERMOSTAT

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4 Claims. (Cl. 297—15)

This invention relates to thermostats, and with regard to certain more specific features, to adjustable thermostats.

Among the several objects of the invention may be noted the provision of a thermostat of the snap-acting type having a wide range of action, both under snap-acting and other conditions, adjustable over wide ranges by means of the improved construction herein set forth. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structure hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawing, in which is illustrated one of various possible embodiments of the invention,

Fig. 1 is a side elevation of the device;

Fig. 2 is a plan view; and,

Fig. 3 is a cross section taken on line 3—3 of Fig. 2, the dotted lines showing an alternate position of a corrugated thermostatic disc.

Referring now more particularly to Fig. 1, there is illustrated at numeral 1 a circular body having an internal groove for peripherally supporting a preferably radially corrugated, composite, thermostatic disc 3 of the type set forth and described more particularly in my Patent No. 1,895,590, dated January 31, 1933, for snap-acting device. Broadly this disc comprises a composite sheet which is slightly conical and having an opening 5 at the center. It is thus truncated. The material from which the disc is formed comprises composite metal, sometimes referred to as "thermostatic metal". This composite metal comprises a sheet made up of a plurality of component sheets, the several component sheets each having a different coefficient of thermal expansion. In its simplest form, with two metals only, it is commonly known as "bimetal". The conical or bulged disc is radially corrugated, the corrugations 7 being deeper at said central opening than at the periphery, as shown. The disc 3 functions to snap from the solid-line position shown in Fig. 3 to the dotted-line position at one temperature and to snap back at another temperature. Contacts 9 and 27 are provided for making and breaking a circuit 11, for example, but it is to be understood that other functions may be performed, such as opening and closing a valve. The stationary member 27 of the contacts is mounted in a bushing 29 in the casing 1. One of the wires 11 is joined to the casing at an extension 25 and the other to the contact 27.

One of the objects of the present invention is to provide an adjustment, whereby the temperature differential at which the disc operates may be changed and also the temperature per se at which operation takes place.

The above is accomplished by suspending from the periphery of the ring 1, at preferably 120° intervals a group of tension springs 13 which are fastened downwardly to a nut 15 into which nut 15 is threaded an adjusting rod 17. The rod 17 carries an adjusting knob or wheel 19 at its lower end and reacts at its other end on the disc 3 when the disc is in its dotted line position. A shoulder 21 provides the reaction and an extension 23 through the opening 5 carries the other contact 9. The shoulder is spaced from the disc 3 in closed position of the switch so that when the switch opens, the contact opens only when the disc 3 is about to snap. A cover plate 18, secured to the housing 1, holds the rod 17 in centralized position on the disc 3, but does not affect the longitudinal movement of said rod 17.

It is clear that without tension in the springs 13, the disc 3 will function between certain temperature limits to make and break contact, this being done by the said snap action.

To change the limits of operation it is necessary only to turn the knob 19, thus causing an action at the shoulder 21, the rod 17 threading into the nut 15. This resiliently places a strain in the disc, thereby setting up stresses therein, the reaction being brought about at the periphery of the disc by means of the spring 13. The disc with its new set of stresses will then react with a snap action over a new and/or shorter temperature differential.

The construction provides a fine adjustment over a wide range.

It is apparent that some of the advantages of the invention may be had by using an uncorrugated, snap-acting disc with the other elements enumerated, such a disc being shown in Patent 1,448,240, dated March 13, 1923. From this it will be seen that other forms of thermostats may be likewise adjusted within the meaning of the disclosure.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above descrip-

tion or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. An adjustable thermostat comprising a snap-acting, radially corrugated, composite metal disc, a threaded rod engaging the said disc centrally, a nut on said rod, mounting means engaging the disc at its outer periphery, and at least one spring reacting between the nut and said mounting means.

2. An adjustable thermostat comprising a snap-acting, radially corrugated, composite metal disc, a threaded rod engaging the said disc centrally, a nut on said rod, mounting means engaging the disc at its outer periphery, plurality of equally spaced springs reacting between the nut and said mounting means, and means controllable to be opened and closed by said disc, said last-named means moving in accord with the position of the center of said disc.

3. An adjustable thermostat comprising a snap-acting composite metal disc, a threaded rod engaging the said disc centrally, a nut on said rod, mounting means engaging the disc at its outer periphery, and at least one spring reacting between the nut and said mounting means.

4. An adjustable thermostat comprising a snap-acting composite metal disc, a threaded rod engaging the said disc centrally, a nut on said rod, mounting means engaging the disc at its outer periphery, a plurality of equally spaced springs reacting between the nut and said mounting means, and means controllable to be opened and closed by said disc, said last-named means moving in accord with the position of the center of said disc.

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