

(No Model.)

W. G. DAY.
THERMOSTAT.

No. 560,023.

Patented May 12, 1896.

Fig 1.

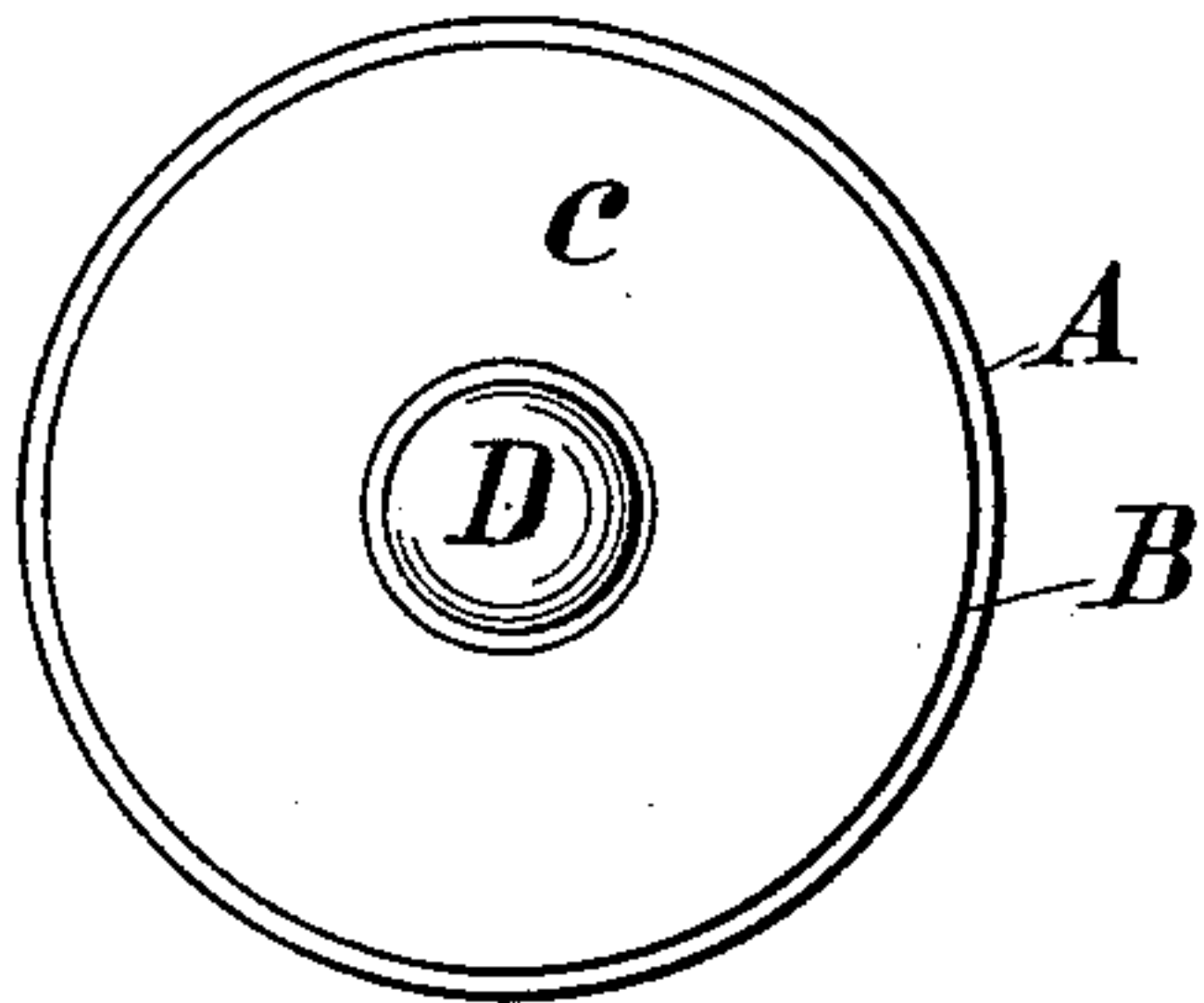


Fig 4.

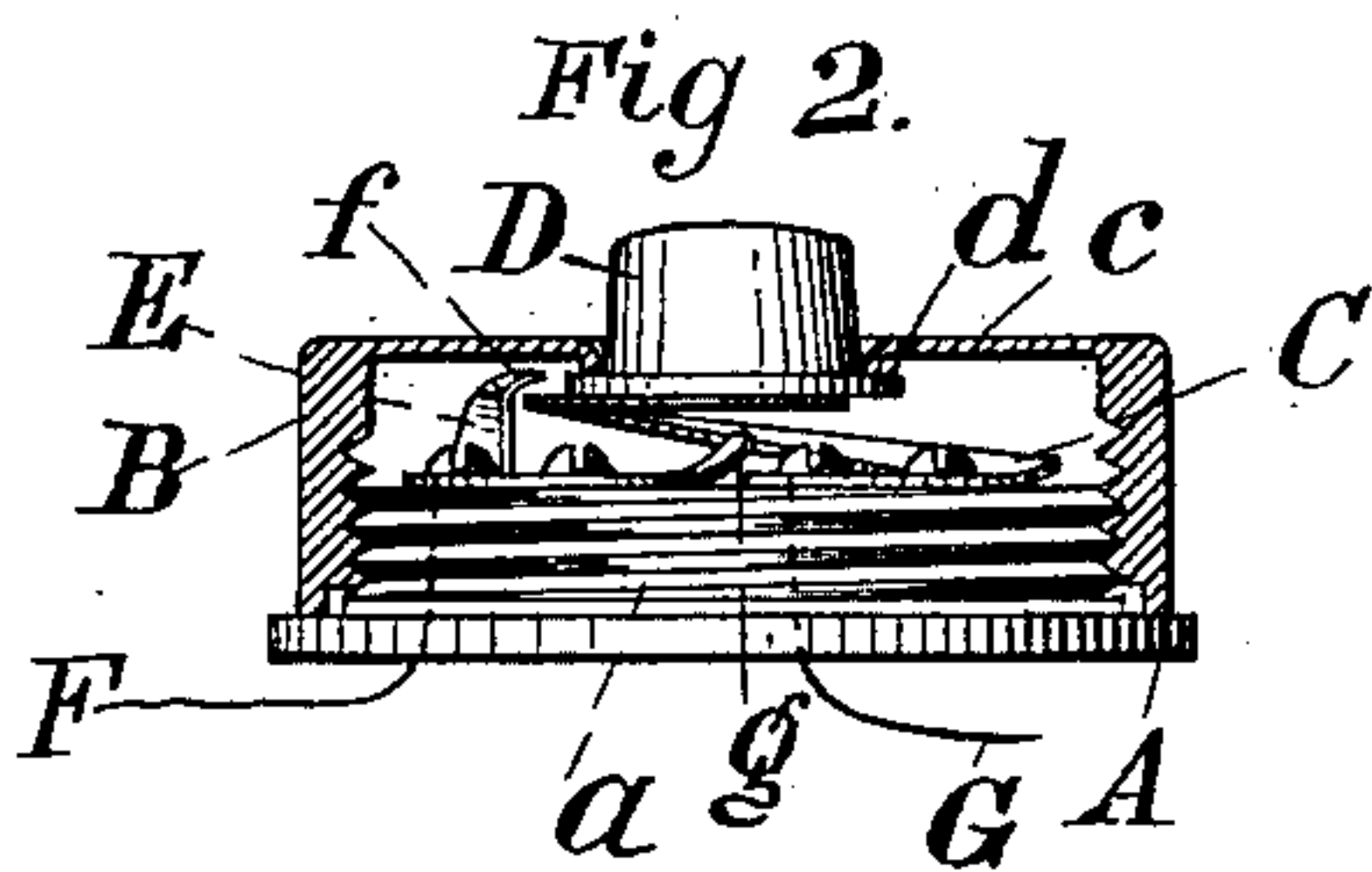
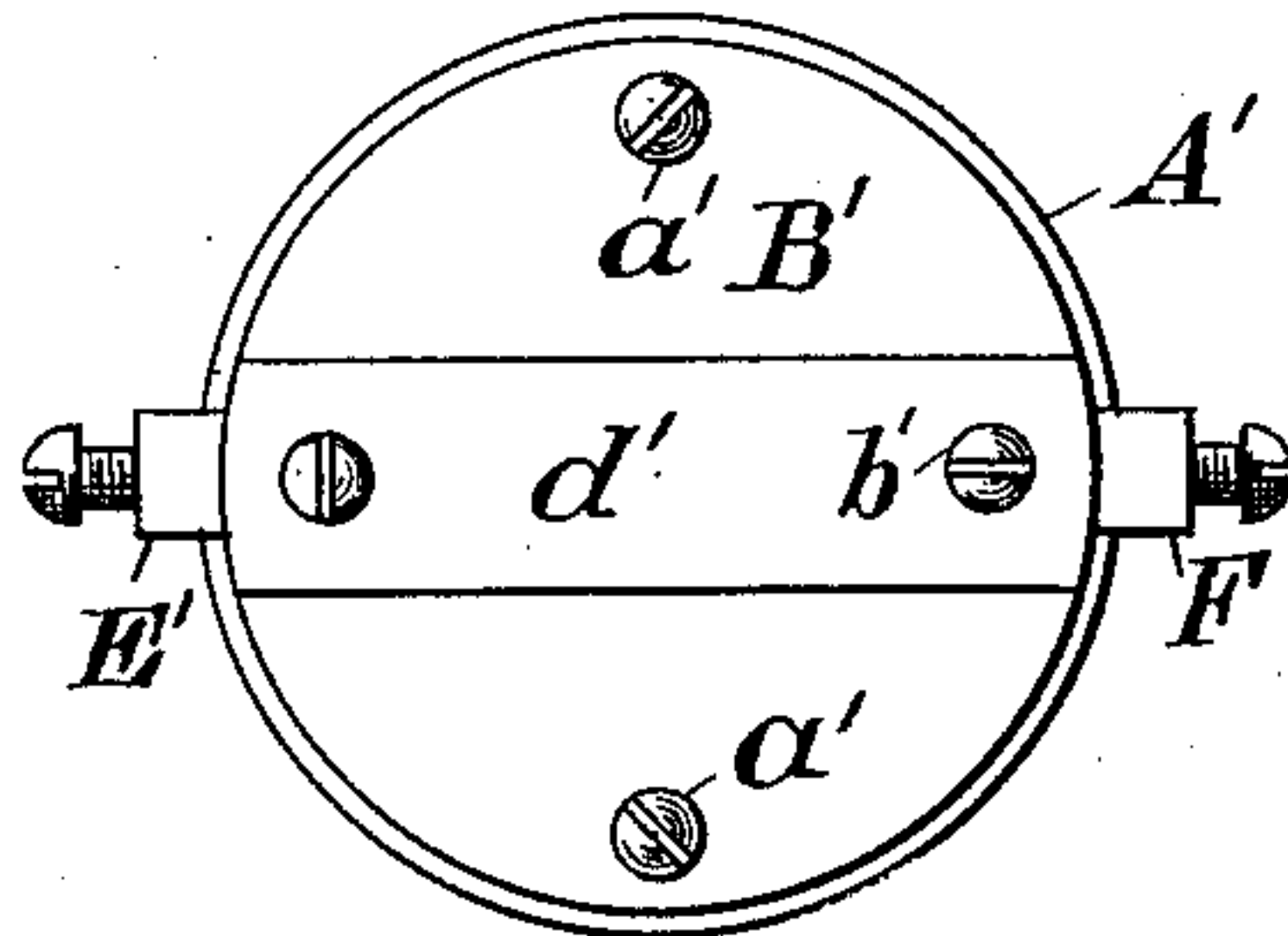


Fig 3.

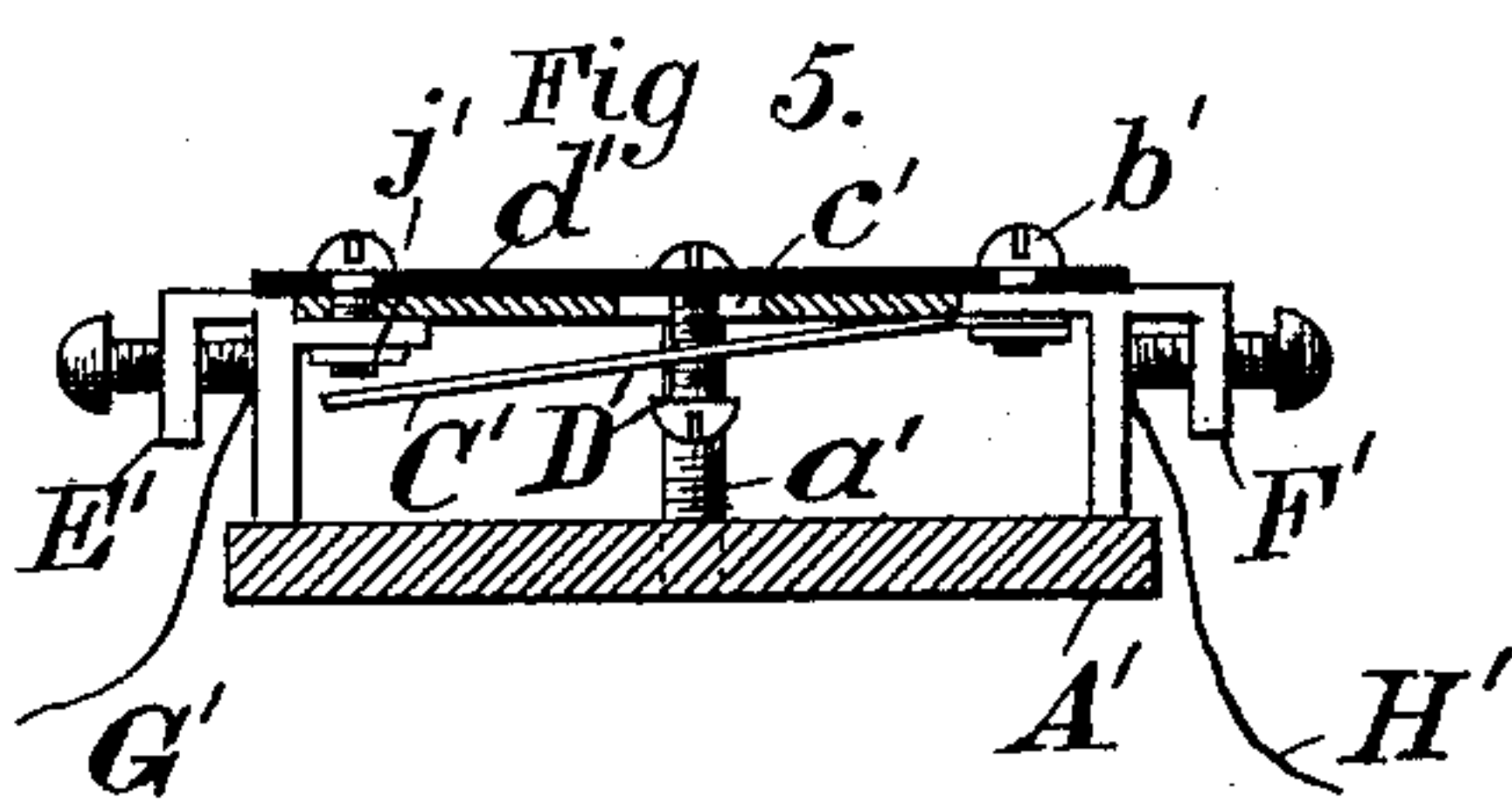
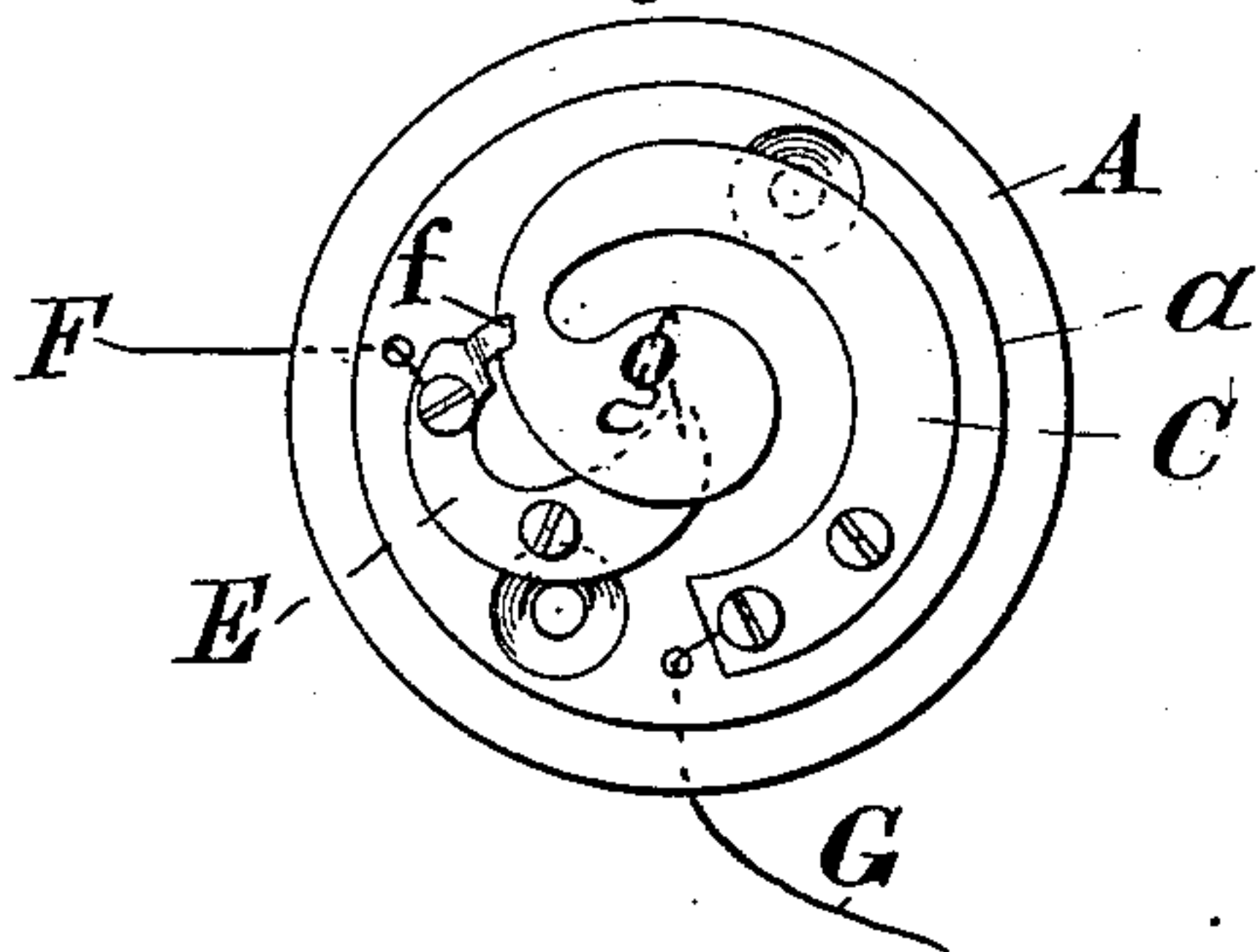
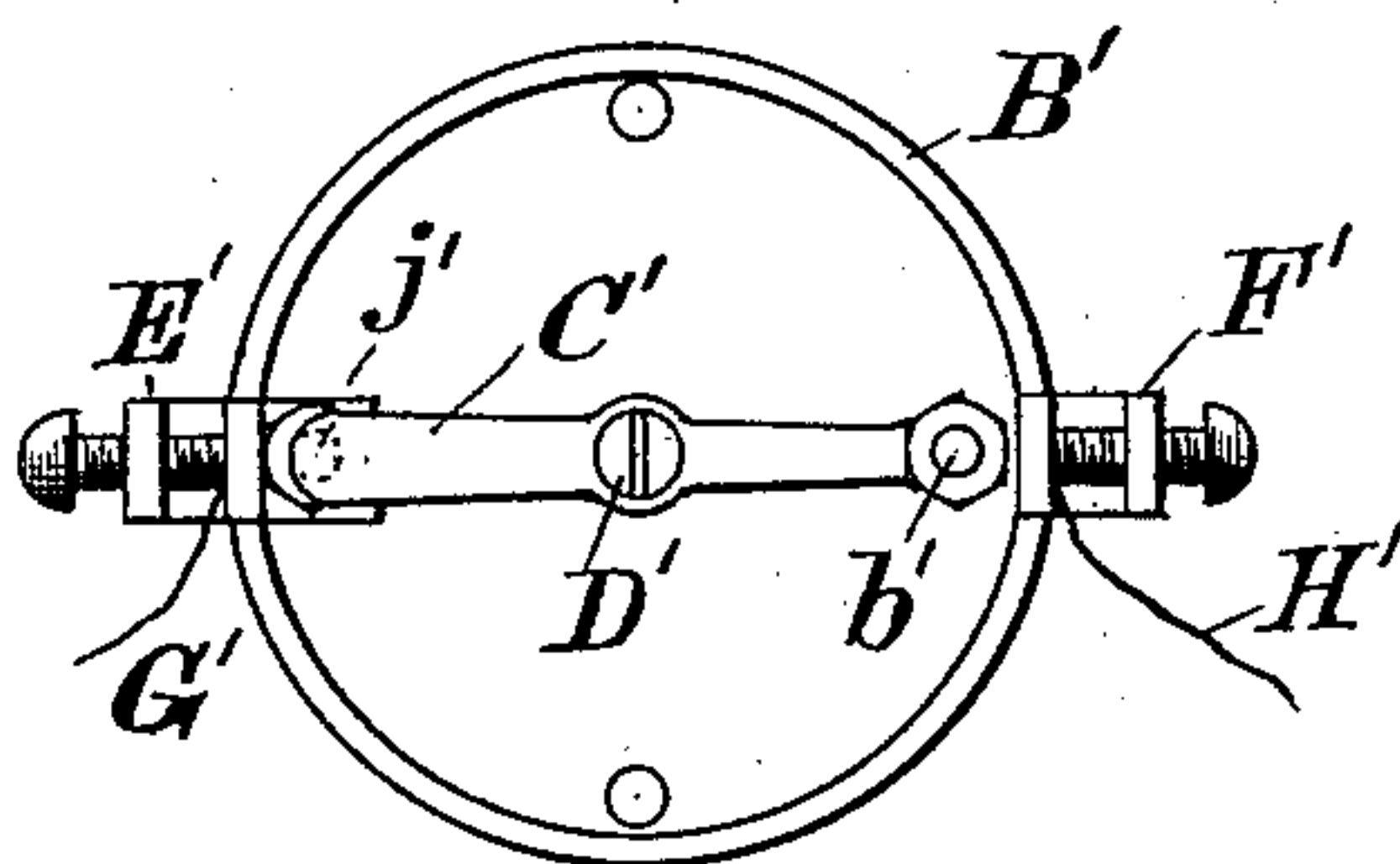


Fig 6.



-WITNESSES-

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UNITED STATES PATENT OFFICE.

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SPECIFICATION forming part of Letters Patent No. 560,023, dated May 12, 1896.

Application filed January 4, 1895. Serial No. 533,794. (No model.)

To all whom it may concern:

Be it known that I, WILLARD G. DAY, of the city of Baltimore and State of Maryland, have invented certain Improvements in Thermostats, of which the following is a specification.

The object of my invention is to provide an economical and reliable thermostat which can be used to give a signal, as by making or breaking an electric circuit or through other mechanical devices to ring a bell, drop an annunciator, open or shut a valve, or operate other devices, when a predetermined degree of heat is reached. This I accomplish by holding down a spring the extension or resilient movement of which is adapted to make or break an electric circuit when released and thereby effect the desired result, which consists in giving some kind of an alarm or warning by means of a plate, disk, or bar, of horn, hard rubber, celluloid, or other substance which is softened by heat and thereby rendered incapable of holding down the said spring. The said retaining substance is of sufficient rigidity at ordinary temperatures to hold down the said spring, but when softened by reaching a predetermined temperature it becomes incapable of resisting the resilience of the spring with the result before stated.

The form of the thermostat may be such as to adapt it for heat-signals alone or to be used as a call push-button to be operated by hand.

In the description of the said invention which follows reference is made to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is a top view of the thermostat arranged for the double purpose of automatically giving an alarm in case of a dangerous rise in temperature in the air surrounding the instrument and as a push-button to give a call. Fig. 2 is a side view of Fig. 1 with a portion of the mechanism shown in section. Fig. 3 is a top view of the invention with a part thereof shown in Fig. 2 in section removed. Fig. 4 is a top view of the thermostat arranged as an automatic alarm device only. Fig. 5 is a side view of Fig. 4 with certain parts thereof shown in section.

Fig. 6 is an under side view of Fig. 5 with the base removed.

Referring now to Figs. 1, 2, and 3, A is the base of the instrument, which in the present case is circular in shape. On the top side of the base A is a circular threaded extension *a*, over which is screwed a case B, having a top *c*, which is formed of horn, celluloid, rubber, or some other substance which will become soft or lose its inherent rigidity as its temperature is increased.

As the top plate *c* is the only part of the case which must have the softening property described it is not necessary that the remainder of the case should be of the same material; but in Fig. 1 the case is made wholly of the same substance.

While the cap is shown as screwed to the base, it is evident that any other form or means of construction can be employed without materially affecting the character of the instrument; but the thread connection is perhaps the best and simplest. To the upper surface of the threaded extension *a* is secured the lower end of a helical-spring plate C.

D is a push-button situated within a hole in the plate *c*, with its lower end seated on the upper end of the helical spring C. A collar *d* on the push-button rests against the under side of the plate *c*. The portion of the plate *c* immediately around the central hole is turned inward, as shown in Fig. 2. The strength of the helical spring is such as to retain the collar *d* of the push-button firmly against the plate *c*, but it is not sufficient to distort or press out the said plate at ordinary temperatures.

E is a curved metallic plate secured by means of screws to the upper surface of the extension *a* of the base A. One end *f* of the curved plate E projects over the upper end of the helical-spring plate C and is somewhat above it, so that no contact is made, while the other end *g* is under the said portion of the helical spring and a short distance below it. The normal position therefore of the upper part or end of the helical-spring plate is one in which it is clear of or out of contact with the ends of the curved plate E. Circuit-wires F and G are respectively attached to

the curved plate E and the helical-spring plate C, as shown in Figs. 2 and 3, and in an open circuit.

The instrument, as shown in the drawings, is in its normal condition—that is to say, the parts thereof are in the relative positions which they occupy when the temperature is not high enough to materially soften the plate c, which retains the helical-spring plate from contact with the point *f* of the curved plate E. It is thus in a condition wherein the push-button may be employed by hand to close contact between the helical-spring plate and the point *g* of the curved plate E to turn in an alarm or give a call; but it is also in a condition wherein it is adapted to automatically give an alarm should the temperature of the air rise to a predetermined height, as upon that temperature being attained the rigidity of the plate *c* will be so reduced as to allow of its resistance to the action of the helical spring being overcome, and the said spring therefore extends, and in the extension it comes in contact with the point *f* of the curved plate E and closes the circuit.

It will be understood that with the construction described the contact-points *f* and *g* may be separated to any reasonable extent, so that there will not be any danger of accidental contact by the jarring of the instrument and the sending in of a false alarm.

Referring now to Figs. 4, 5, and 6, it will be seen that the push-button is dispensed with and the instrument thereby adapted for fire-alarm purposes alone. In this alternate construction the plate *c* is merely a narrow piece or strip which is secured over and on top of the cup or casing B. This arrangement renders the curved plate E with the two contact-points *f* and *g* unnecessary, and instead of it a single contact point and spring are employed, as hereinafter described. The said modified instrument consists of a base Λ' , to which the case B', which is provided with a head, is attached by means of screws *a'*.

C' is a plate-spring secured at one end to the under side of the head of the case by means of a screw *b'*.

D' is a screw in the plate-spring C', with its point extending through a hole *c'* in the head of the case and bearing against a plate *d'*, which is attached to the outer surface of the said head. This plate *d'*, which is attached to the outer surface, is made from the same substance as the plate *c* in the other construction—that is to say, of a substance that will soften and lose some of its rigidity in being heated.

E' and F' are insulated binding-posts for the circuit-wires G' and H'. They are secured in any suitable manner within the rim of the case B', and the one, E', has a contact-point *j'*, with which the plate-spring C' comes in contact upon the softening of the plate *d'*. The binding-post F' is in electrical contact with the end of the spring C'.

The plate *d'* is shown as in the position which it occupies when not softened by heat, or one which serves to keep the plate-spring C' from contact with the point *j'* through the medium of the screw D', which bears against the under side of the plate. The softening of the plate *d'* allows the screw D' and the spring to move outward and close the circuit, as described in connection with the other construction.

I claim as my invention—

A thermostat comprising a spring in an electric circuit, and a restraining device of hard rubber or the like which is softened by abnormal heat in the surrounding air, the strength of the spring being such as to be restrained in an inoperative condition when the device is hard, and to force itself into an operative condition when the device is softened, substantially as specified.

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Witnesses:

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