

No. 638,680.

Patented Dec. 5, 1899.

P. C. HOWE.
PUSH BUTTON.

(Application filed June 10, 1899.)

(No Model.)

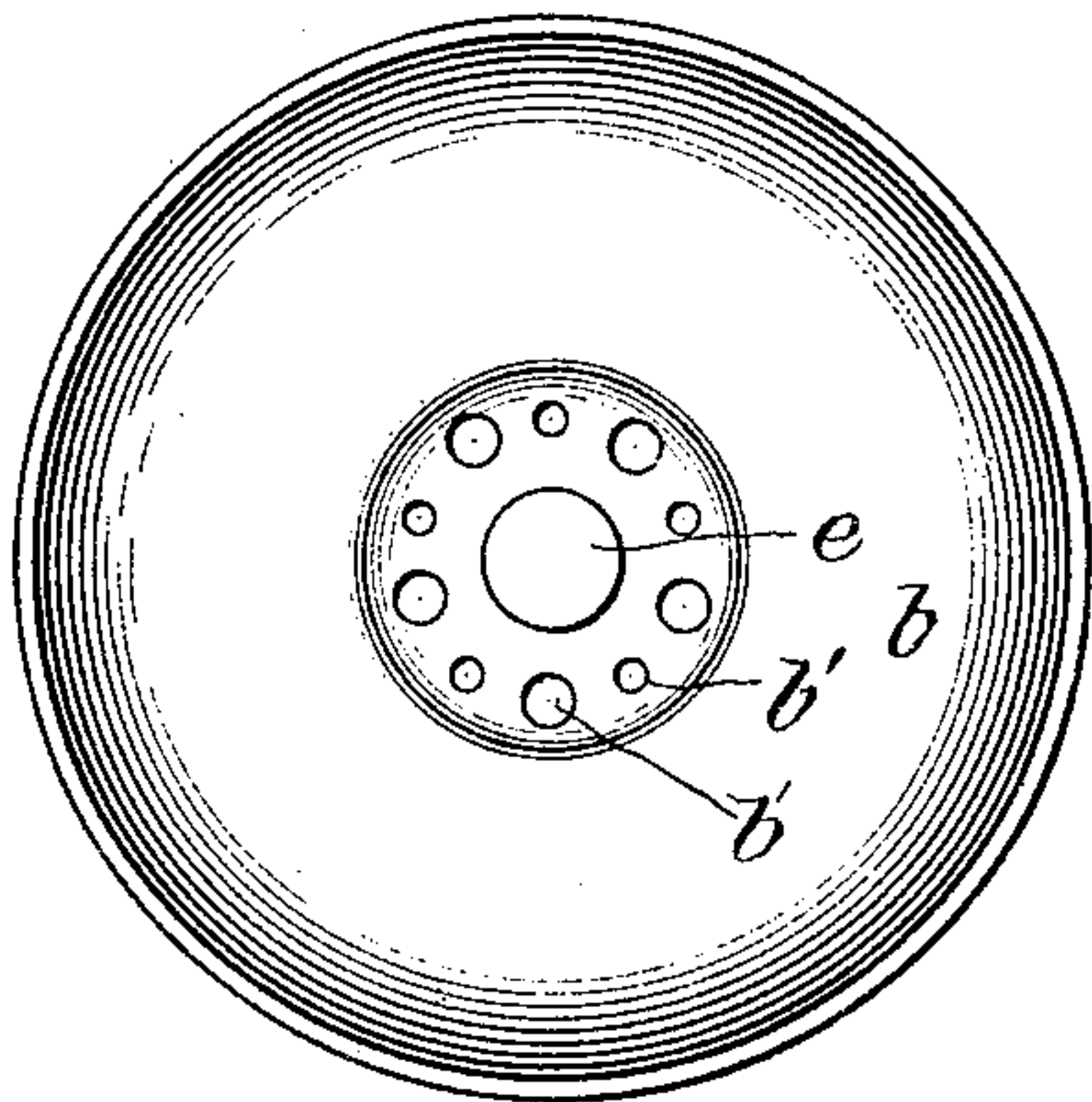


Fig. 1.

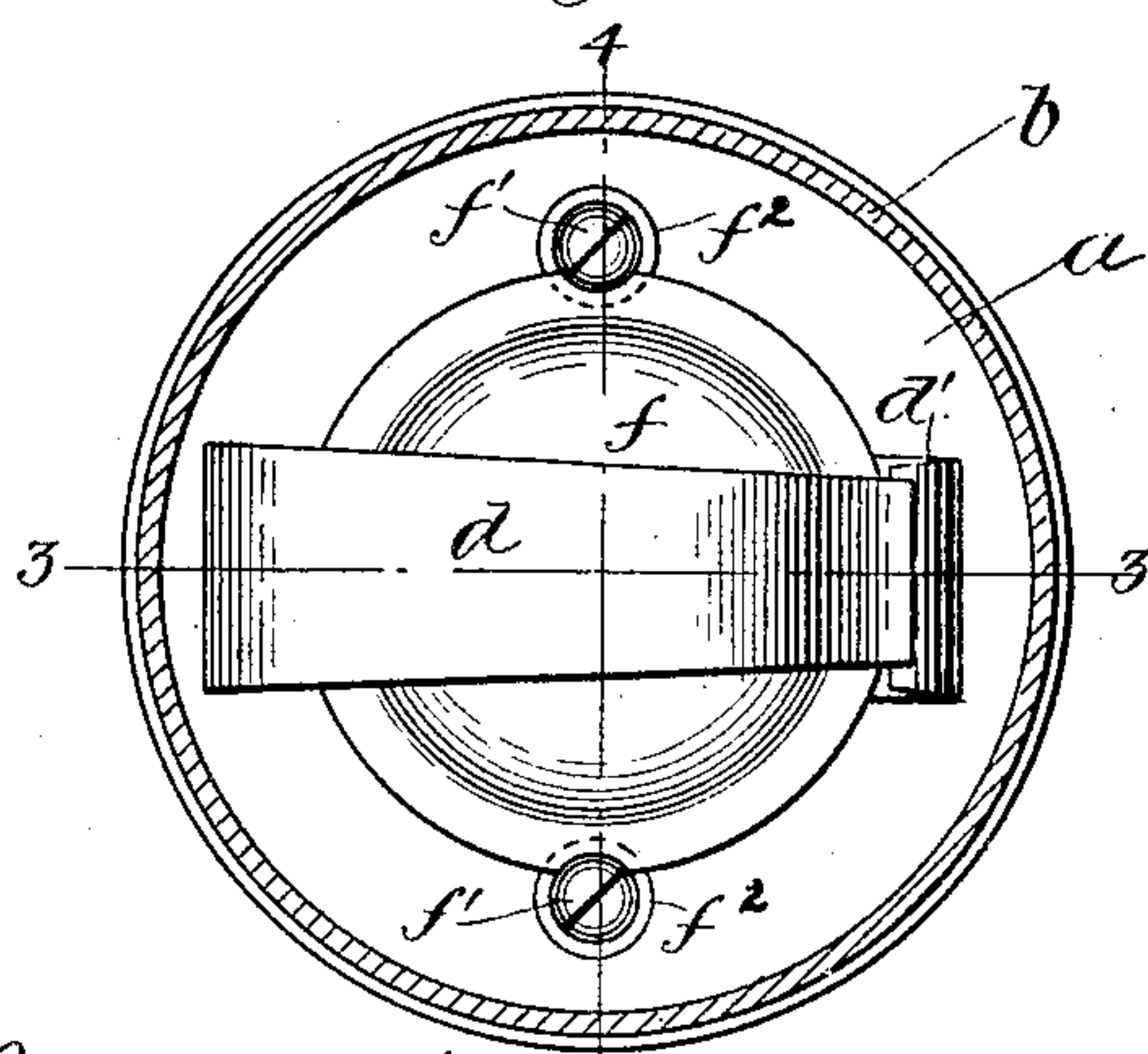


Fig. 2.

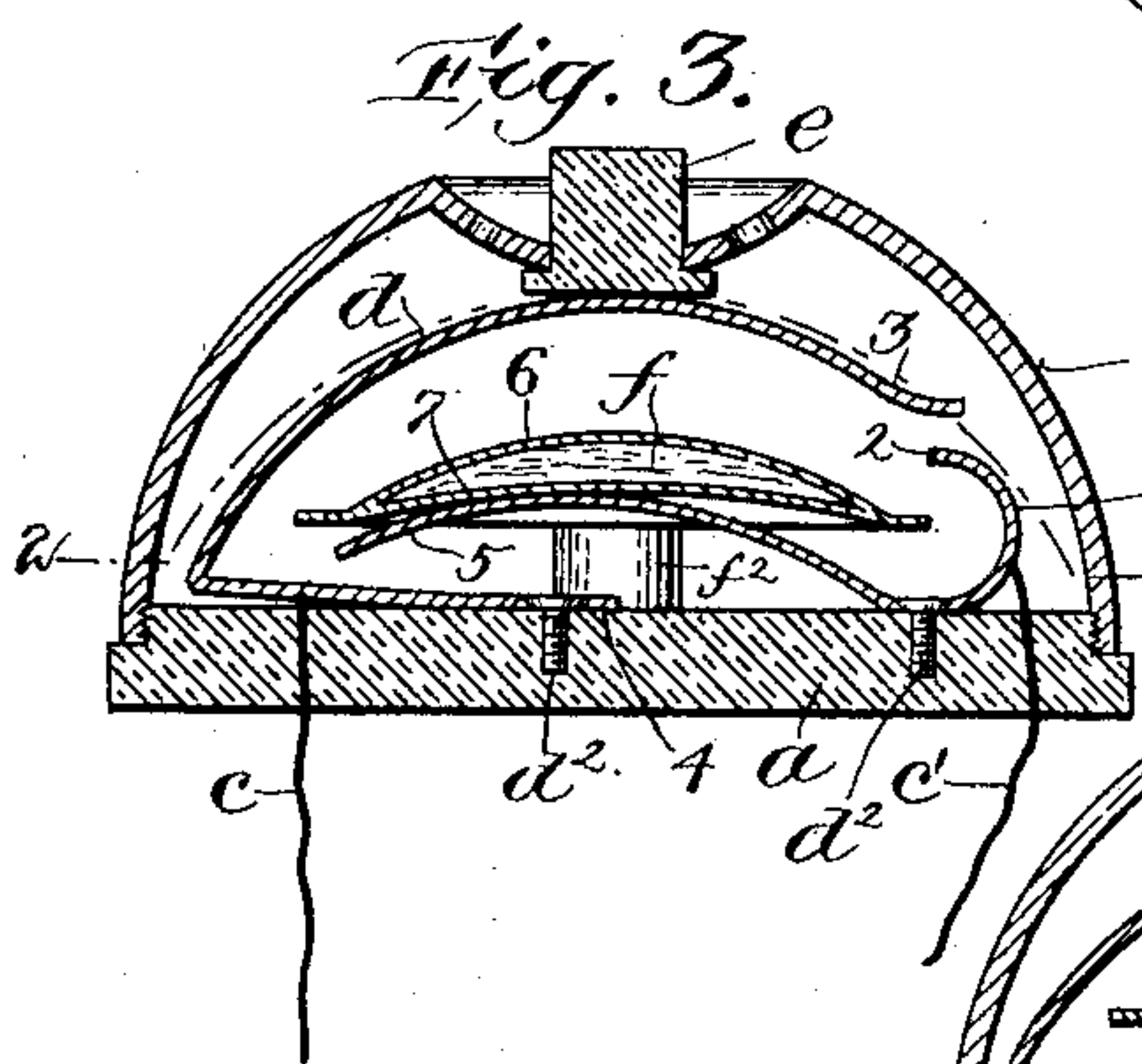


Fig. 3.

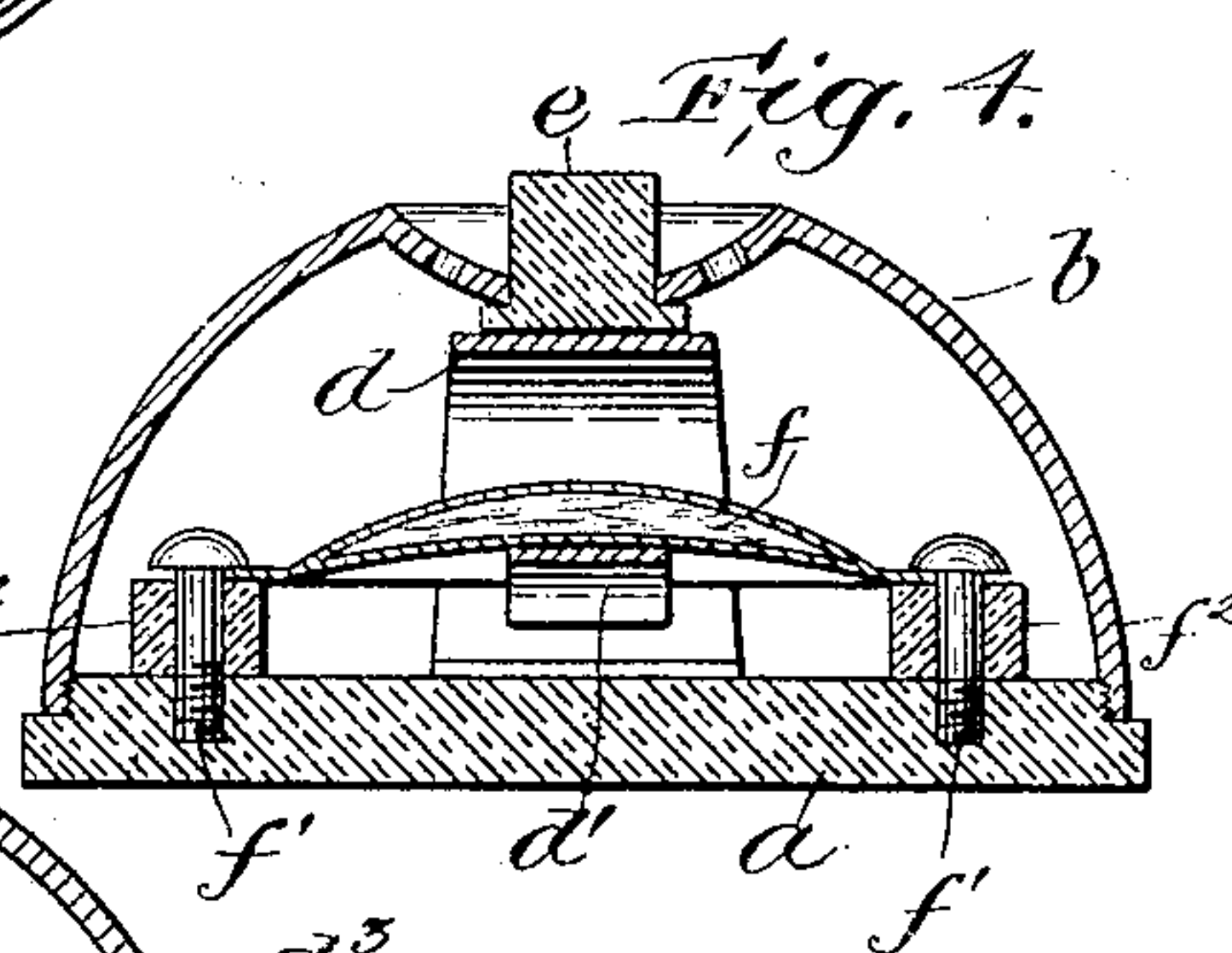


Fig. 4.

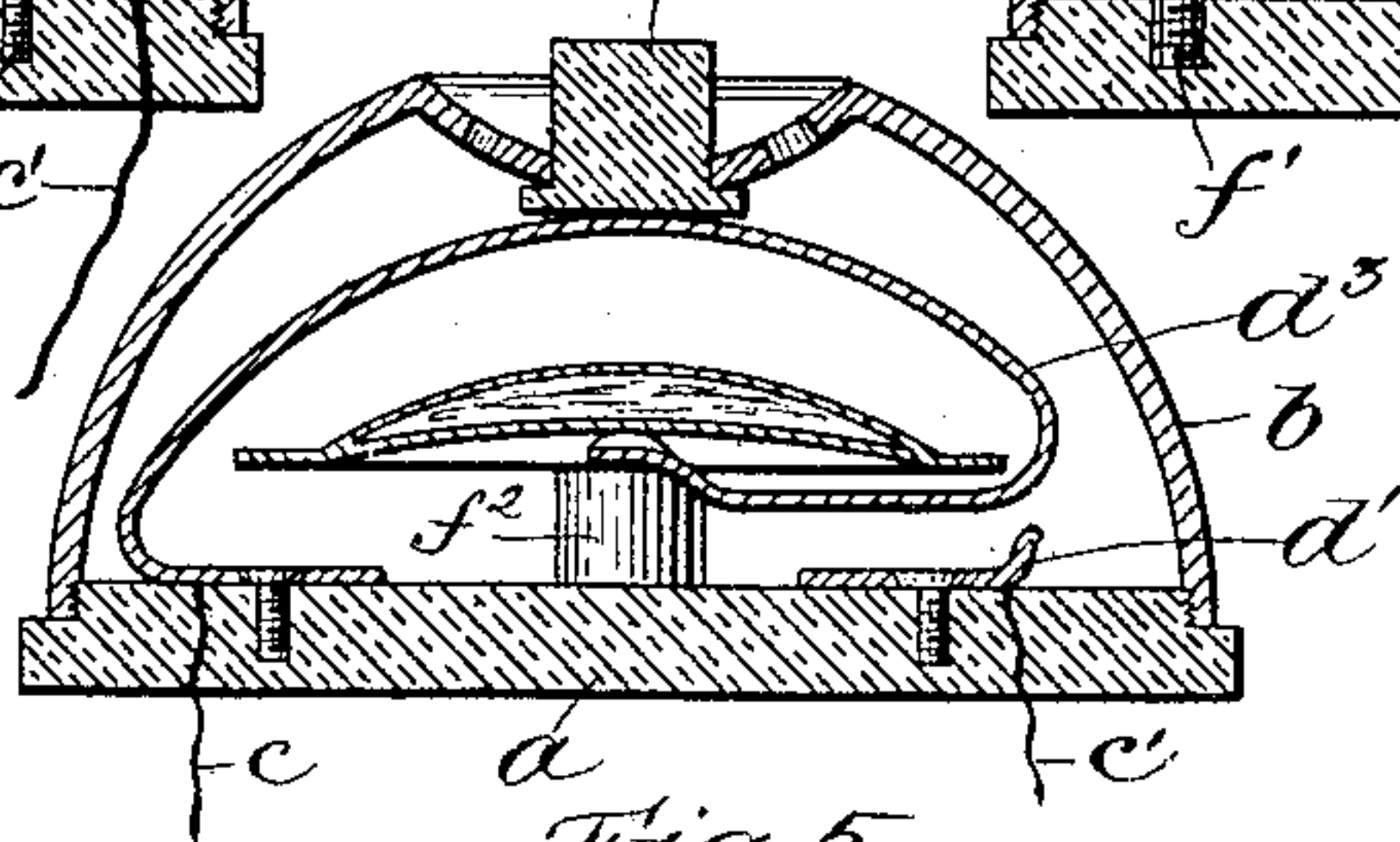


Fig. 5.

Witnesses:

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UNITED STATES PATENT OFFICE.

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PUSH-BUTTON.

SPECIFICATION forming part of Letters Patent No. 638,680, dated December 5, 1899.

Application filed June 10, 1899. Serial No. 720,126. (No model.)

To all whom it may concern:

Be it known that I, PERCY C. HOWE, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Push-Buttons, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to push-buttons adapted to be operated for ordinary signaling purposes and containing thermostatic devices arranged to actuate the circuit upon an abnormal increase in temperature.

It is the object of my invention to make devices of this kind of an indestructible character. Heretofore fusible substances have been employed in the thermostatic portion of devices of this character, and when an increase in temperature has caused an operation of the device the latter is rendered temporarily useless because of the melting of the fusible substance, and the renewal or repair of the thermostat is necessary in order to place the device in condition for operation again.

My invention consists in the improvements which I shall now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a top plan view of a push-button constructed in accordance with my invention. Fig. 2 is a section on line 2 2 of Fig. 3. Fig. 3 represents a section on line 3 3 of Fig. 2. Fig. 4 represents a section on line 4 4 of Fig. 2. Fig. 5 represents a view similar to Fig. 3, showing a single movable contact member.

The same reference characters indicate the same parts in all the figures.

Referring to the drawings, Figs. 1, 2, 3, and 4, *a* is a base, which may be composed of a suitable insulating substance, such as vulcanized fiber or rubber or wood, and *b* is a cap, of hemispherical form, screwed to the base *a* in the ordinary and well-known manner.

c c' are the terminals of the circuit, which are carried through the base *a* and connected with two metallic contact members *d d'*, attached to the base by screws *d² d²*. The members *d d'* are composed of spring metal and are bent around, so as to bring their ends into proximity at two places, the ends 2 3 be-

ing normally separated and adapted to be brought into contact by depressing the free spring end 3 upon the end 2 and the ends 4 5 being normally separated and adapted to be brought into contact by depressing the free spring end 5 upon the end 4.

A flanged button *e*, of insulating material, projects through the central aperture of the cap *b* and rests upon the free end 3 of the outer member *d*. By pressing said button inwardly contact between the ends 2 3 is produced and the circuit closed, as usual in push-buttons.

f is a chamber or receptacle composed, preferably, of metal and attached to the base *a* by means of screws *f' f'*, blocks *f² f²*, of insulating material, being interposed between the base and the edges of the chamber in order to raise the latter above the base. The upper wall 6 of the chamber *f* is convex in form, and the under wall 7 thereof is concave and made very thin and flexible. The thermostatic action of the chamber *f* is produced by placing a suitable volatile substance or substances, such as a hydrocarbon liquid, within the chamber, the latter then being sealed tight by securely attaching the upper and lower plates 6 7 along their edges. The free end 5 of the inner member *d'* is brought up underneath the chamber *f*, in contact with its lower wall 7. Then the temperature of the space or apartment in which the push-button is located increases to a sufficient extent to vaporize the volatile liquid contained in the chamber *f*, causing its lower side to bulge downwardly, the end 5 of the contact member *d'* is brought into contact with the end 4 of the member *d*, and the circuit is closed, causing the actuation of a bell or other alarm device placed in the circuit. When the temperature again decreases, the lower wall of the thermostat assumes its normal position and allows the contacts 4 5 to separate and break the circuit. It will thus be seen that the thermostat can at any time be tested by bringing a source of heat, such as a lighted match, in proximity to the push-button and causing the actuation of said thermostat, the latter returning to its normal condition when the source of heat is removed. This feature of indestructibility gives my

device an advantage over devices of similar character employing fusible substances to keep the contacting members in their normal positions, since, as hereinbefore stated, the melting of said fusible substances makes the thermostat temporarily useless.

In order to provide free access of the outside air to the interior of the casing, I provide the cap *b* with perforations *b'* *b''*.

It is obviously within the scope of my invention to provide other arrangements of the contacts in accordance with well-known circuit systems. For instance, the thermostat might be employed to keep a circuit normally closed instead of normally open, as shown.

The advantage of relative indestructibility obtained by the use of the metallic thermostat above described, consisting of a flexible-walled metal chamber and a volatile substance therein, may be obtained by the employment of any other suitably-constructed metallic thermostatic device adapted to be deflected by a change of temperature.

It is obvious that the thermostatic device may be arranged to be operated by a decrease in temperature, so that its contraction will act on an electric current to give an alarm for incubators, conservatories, &c., where a decrease of temperature below a predetermined degree is to be avoided.

In Fig. 5 I show an arrangement in which a single movable contact member *d*³ is employed, the same being arranged to be operated both by the push-piece *e* and by the flexible bottom of the chamber *f*, the displacement of which causes contact between the members *d*³ and *d'*. The same result is produced by the depression of the push-piece.

Having thus explained the nature of my invention and described a way of constructing and using the same, although without having attempted to set forth all the forms in which it may be embodied or all the modes of its use, I declare that what I claim is—

1. In a push-button the combination of a base; circuit-terminals fastened thereto; two contact members each connected to one of the terminals; a thermostat adapted to operate automatically to move one of said members into contact with the other member; and a push-piece movable independently of said thermostat, and adapted to be manually operated to engage and move one of said mem-

bers into contact with the other member, substantially as described.

2. A device of the character specified, comprising a base, circuit-terminals fastened thereto, inner and outer movable contact members mounted on the base, a metallic thermostat interposed between the two members and adapted to act on the inner member, and a push-piece arranged to act on the outer member.

3. A device of the character specified, comprising a base, circuit-terminals fastened thereto, a metallic receptacle having a flexible inner wall supported above the base, said receptacle containing a volatile substance, an outer movable contact member affixed to the base and having a free end projecting above the said chamber, and an inner movable contact member affixed to the base and having a free end projecting below the chamber in contact with its flexible inner wall.

4. In a push-button the combination of a base; circuit-terminals fastened thereto; two contact members each connected to one of the terminals; a thermostat adapted to operate automatically to move one of said members into contact with the other member; a push-piece movable independently of said thermostat and adapted to be manually operated to engage and move one of said members into contact with the other member; and a perforated cap secured to the base in which said push-piece is mounted, said cap inclosing the thermostat and the two members, substantially as described.

5. A device of the character specified, comprising a base, circuit-terminals fastened thereto, inner and outer movable contact members mounted on the base, a metallic thermostat interposed between the two members and adapted to act on the inner member, a push-piece adapted to act on the outer member, and a cap formed with perforations in which the push-piece is mounted, said cap secured to the base and inclosing the thermostat and the two members, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 29th day of April, A. D. 1899.

PERCY C. HOWE.

Witnesses:

ANNA C. KINGSBURY,
WILLIAM EDSON.