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1,683,264

H. J. SAUVAGE

THERMOSTAT

Filed Sept. 27, 1926

Fig. 1.

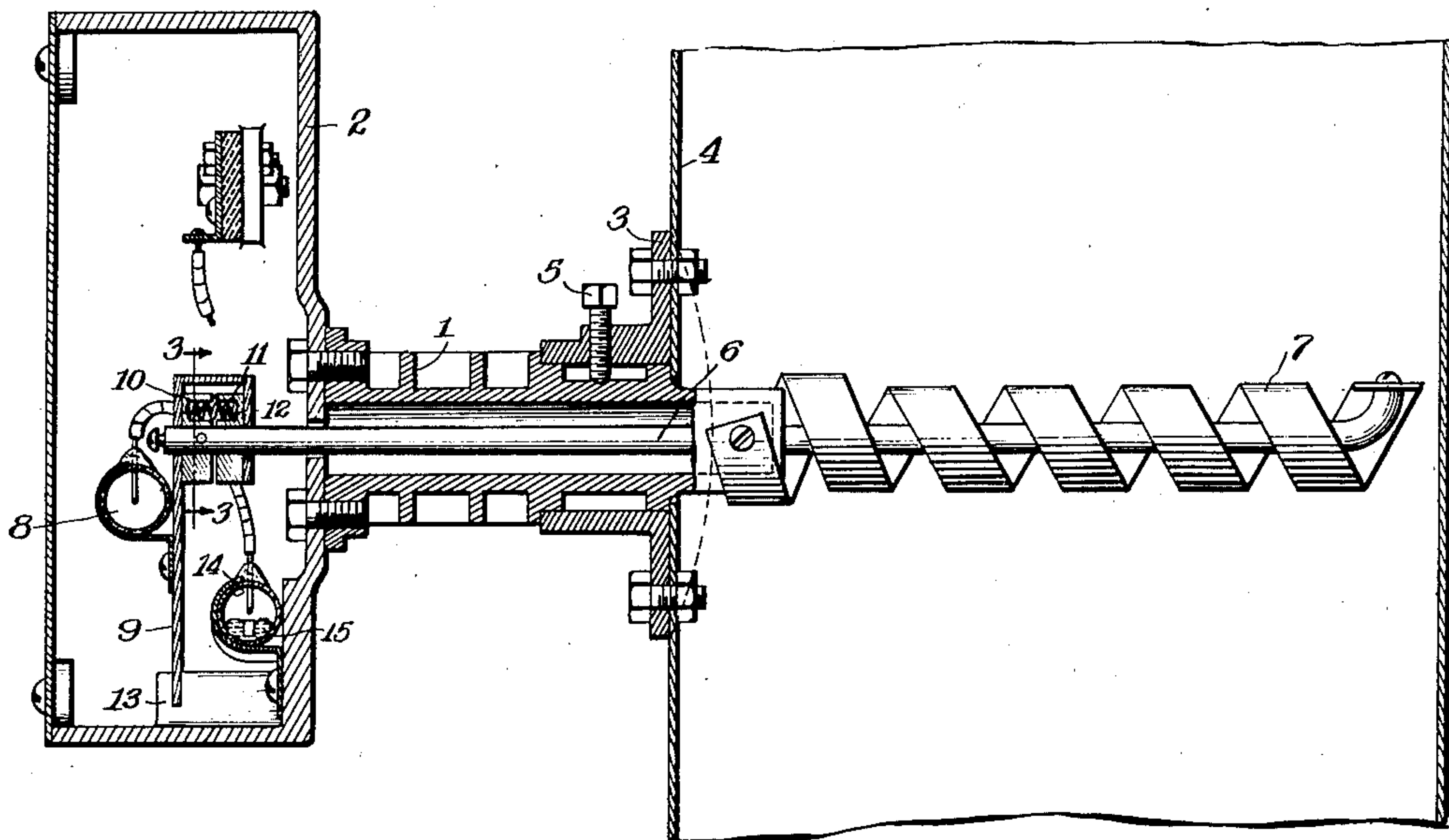


Fig. 3.

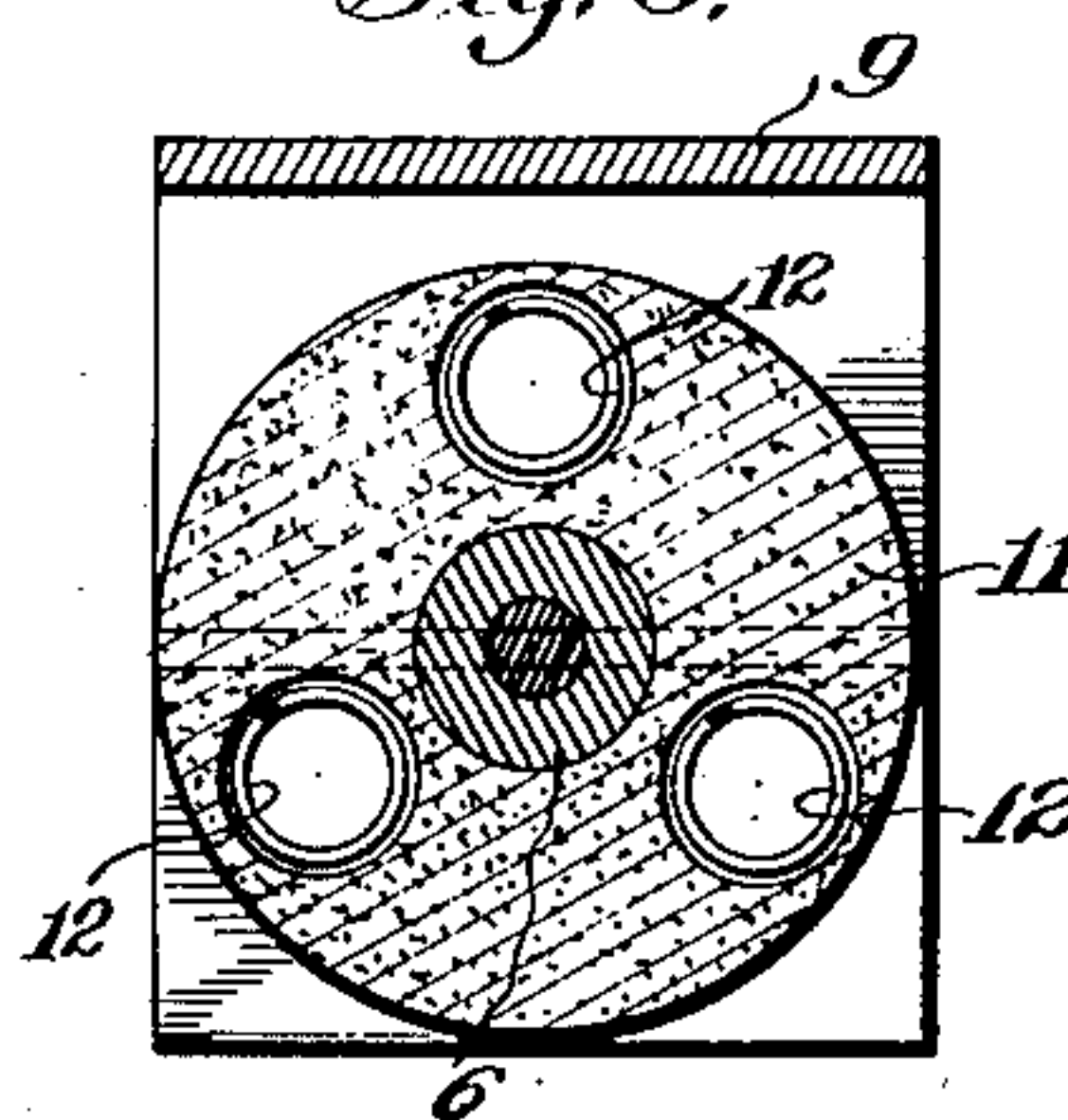
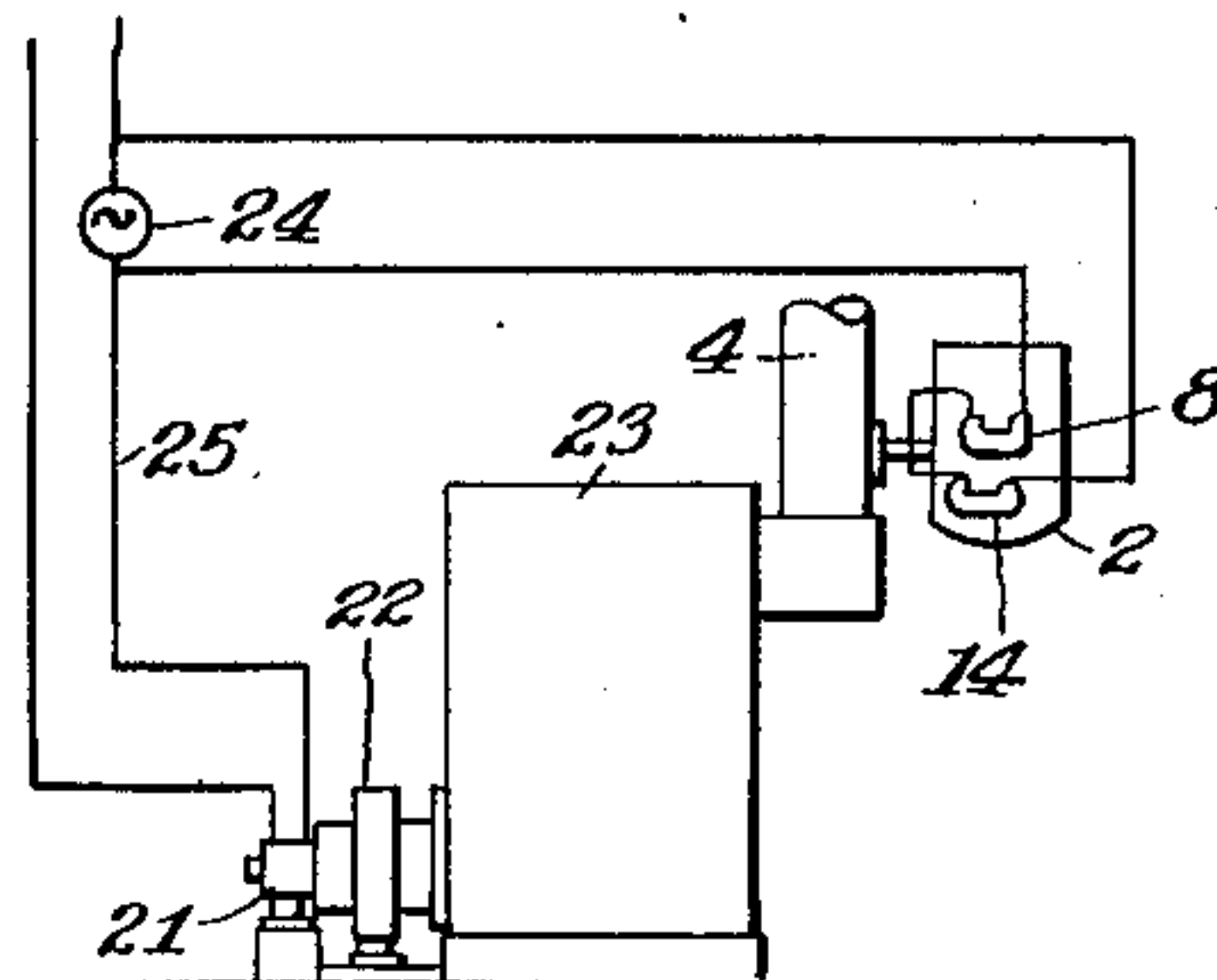


Fig. 4.



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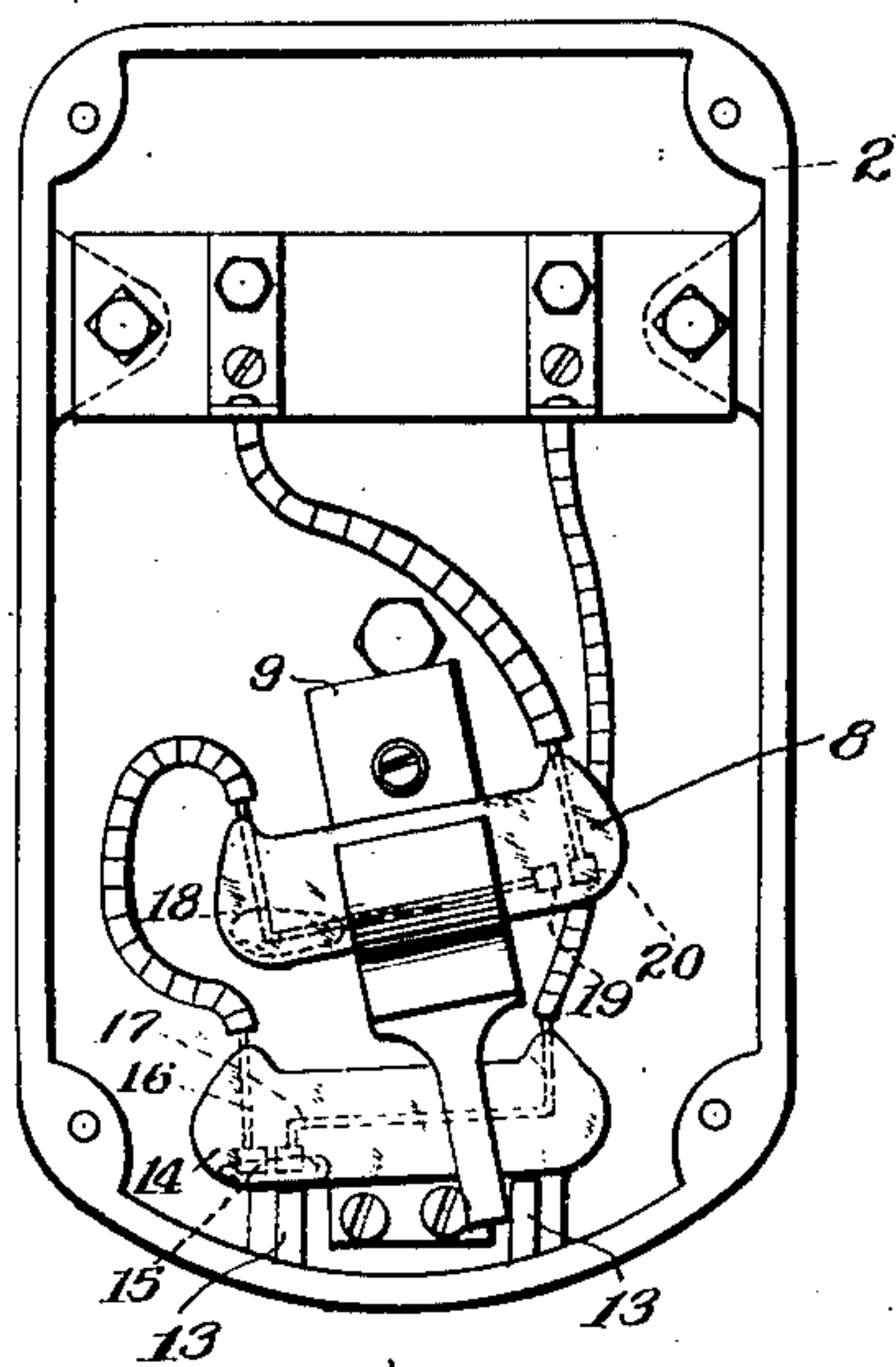


Fig. 2.

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THERMOSTAT.

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This invention relates to safety devices for thermostats, more especially for thermostats having gravity operated switches, such as mercury bulb switches, which are liable to get out of adjustment when the switch support or casing is accidentally tilted or im-

properly positioned. Such switches are often used for safety devices and the main objects of this invention are to prevent such devices from becoming a menace rather than a protection through inadvertent tilting of the device. Other objects are to provide means whereby the proper position may be determined when the device is installed, so that the device may be properly adjusted by the manufacturer.

An illustrative embodiment of this invention incorporated in a stack thermostat is shown in the accompanying drawings, in which:—

Figure 1 is a sectional view of the thermostat.

Fig. 2 is a front elevation of the thermostat with the cover removed.

Fig. 3 is an enlarged detail section on the line 3—3 of Fig. 1.

Fig. 4 is a diagram of the wiring connections.

In this invention, a mercury bulb switch is fixedly mounted in the thermostat housing, and wired in series with the thermal operated switch. When the housing is in the normal position, the fixed switch is closed, and the tilting switch may function to open or close the circuit. But when the housing becomes tilted so that the active switch closes too soon or remains closed, the fixed switch is open and renders the active switch ineffective until the device is properly re-adjusted.

In the stack thermostats, the tubular projection or hub 1 of the thermostat housing 2 is customarily mounted in the flanged hub member 3, which is secured to the stack 4, and prevented from turning therein by means of the set screw 5. The set screw 5 threads through the hub portion of the member 3 and engages the cylindrical stem 1. The rod or shaft 6 is rotatably mounted in the housing and projects into the stack 4 where it is secured to the outer end of the thermal responsive coil 7 which is rigidly secured, at the opposite end, to the inner end of the hub 1.

In this invention, the thermal switch 8 is mounted in a depending lever 9 which is supported on the end of the rod 6, and frictional-

ly connected therewith for rotation. The frictional connection comprises a disc 10, fixed on the rod 6, and a disc 11 loosely mounted on the rod. Said discs are included between the two legs of the U-shaped end of the lever 9, and pressed into frictional engagement therewith by means of the springs 12 which are mounted between the discs. The arc of rotation of the lever 9 is limited between the stop lugs 13, integral with the bottom of the casing 2, so that after the switch has been operated, the rod 6 may continue to turn, but will operate the switch 8 immediately upon a change in the direction of rotation.

The safety switch 14 is fixedly mounted in the lower part of the housing 2 and is connected in series with the active switch 8. In the normal or correct position of the housing 2, the switch 14 is inclined to the left, as shown in Fig. 2, and the mercury 15 of the switch electrically connects the switch points 16 and 17.

In off position, same figure, the switch 8 is tilted so that the mercury globule 18 is at the left end and the switch points 19 and 20, at the right end of the switch, are open.

When the thermal element 7 is heated and expands, the shaft 6 is rotated clockwise, and tilts the switch 8 so that the mercury bulb 18 closes the contacts 19 and 20. It is obvious that if the housing 2 is accidentally or improperly tilted clockwise, the switch 8 would remain closed at all times, and the thermostat would not function as a safety device without the fixed switch 14 which would then be in open position and render the switch 8 ineffective. Of course, if the housing were tilted counter-clockwise, the switch 8 could not close and the device would be inoperative with or without the safety switch 14.

Thus it can be seen that, by this invention, the thermostat is made more safe, and can be relied upon to work correctly. This improvement has been found to be necessary, because, in some instances, it has been found that the thermostat housing was apt to be struck or displaced by persons working about the furnace, or that the thermostat was not set properly by an unskilled person who was making repairs or doing work around the place where the furnace was installed.

An illustration of the manner in which the stack thermostat may be used is shown in Fig. 4. The motor 21 operates the burner 22

of the furnace 23, the device 2 being attached to the stack 4. A time element fuse 24 is inserted in one side of the motor circuit 25. The member 24 functions to break the motor circuit after a predetermined length of time, but is prevented from breaking the circuit if the combustion is properly started. This is accomplished by means of the stack thermostat, having the series connected switches 8 and 14 shunted across the member 24. If the combustion starts, the heated flue gases operate to close the switch 8 and short circuit the fuse 24 before the time limit has expired.

When installing the thermostat, the correct adjustment of the housing 2 is easily determined by observing the position of the mercury globule 15; and if the device is inadvertently tilted, the functioning of the switch 8 is prevented as described above.

While but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. In a thermostat, a housing for the ther-

mostat, a switch movably mounted in said housing for controlling a circuit, means mounted on the housing for moving said switch, and gravity operated safety means mounted in the housing for rendering said switch ineffective if the housing is not in the proper position.

2. In a thermostat, a housing for the thermostat, a mercury bulb switch tiltingly mounted in the housing for controlling a circuit, thermally operated means attached to the housing for tilting said switch and gravity operated safety means mounted in the housing for rendering said switch ineffective if the housing is not in the proper position.

3. In a thermostat, a housing for the thermostat, a mercury switch tiltingly mounted in the housing for controlling a circuit, thermally operated means attached to said housing for tilting said switch, and a mercury switch fixedly mounted in said housing and connected in series with said switch to prevent closing of the circuit if the housing is not in the proper position.

Signed at Chicago this 25th day of Sept., 1926.

HERBERT J. SAUVAGE.