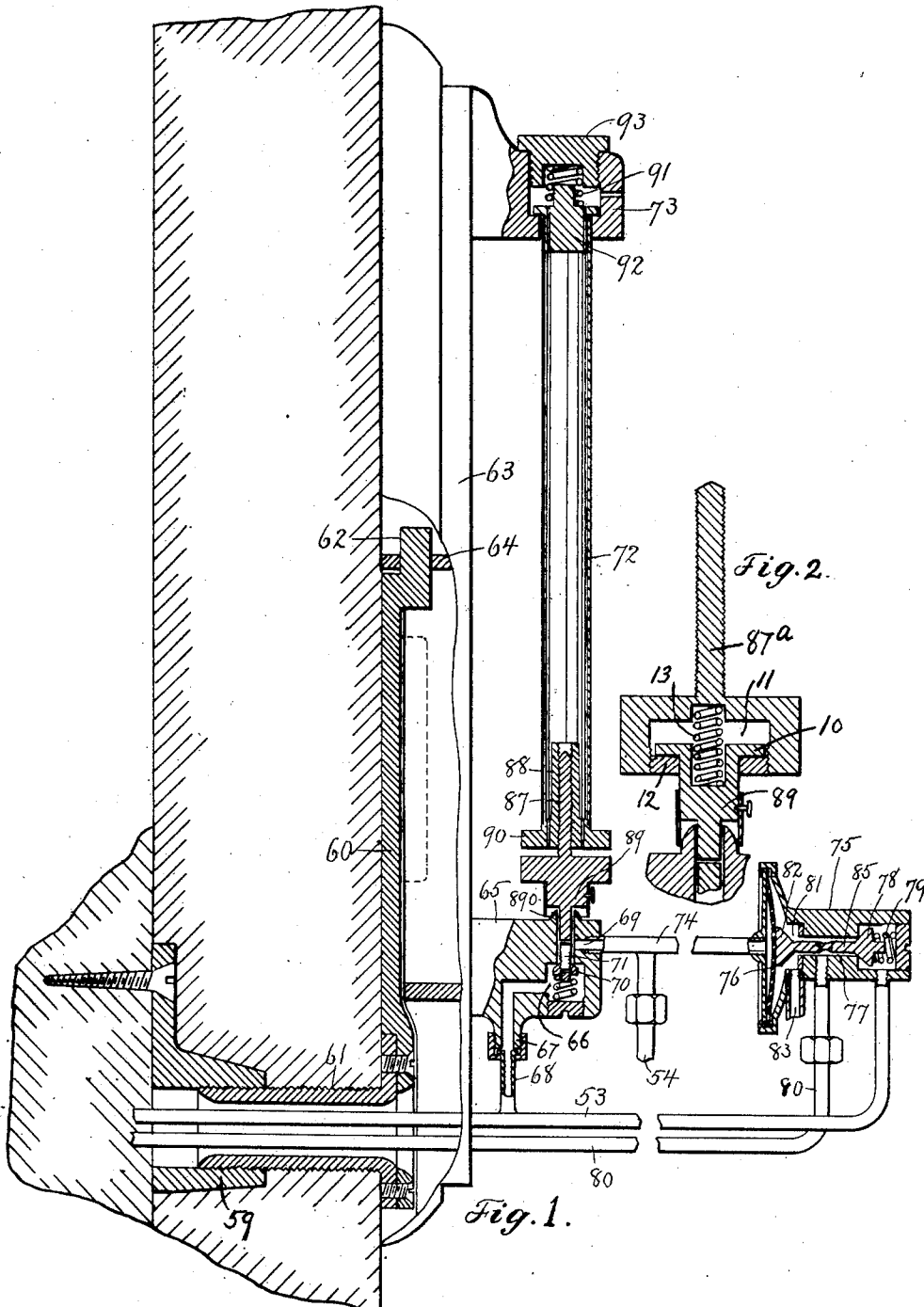


No. 826,458.

PATENTED JULY 17, 1906.

G. A. WELD.
THERMOSTAT.

APPLICATION FILED DEC. 22, 1902.



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GEORGE A. WELD, OF WINCHESTER, MASSACHUSETTS.

THERMOSTAT.

No. 826,458.

Specification of Letters Patent.

Patented July 17, 1906.

Application filed December 22, 1902. Serial No. 136,154.

To all whom it may concern:

Be it known that I, GEORGE A. WELD, of Winchester, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Thermostats, of which the following is a specification.

This invention relates to certain new and useful improvements in thermostats for use in connection with heating and ventilating systems.

The invention has for its object the production of a device of this character for automatically regulating the operation of a valve or other element controlling the motive force of a motor or the like.

A further object is to provide means whereby the valve or other element controlled by said thermostat may be regulated to compensate for variations in temperature.

A further object is to provide improved means for supporting the thermostat.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 represents a longitudinal sectional view of my improved thermostat. Fig. 2 is a detail sectional view of a modification.

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

Referring to the drawings, my improved thermostat comprises the following parts, viz: first, a rigidly-secured holder composed of a flanged internally-threaded sleeve 59, attached by screws to a wall of the apartment, and a vertical plate 60, located on the exterior of said wall within the apartment and provided with an externally-threaded tubular shank 61, engaged with the sleeve 59, said plate having offset shanks 62 at its upper end; secondly, a thermostatic member 63, composed of a vertical plate having a flange 64, which is perforated to receive the shanks 62 and adapted to slip vertically thereon, said member 63 being adapted to expand and contract vertically and composed of metal, such as cast-iron, having a given coefficient of expansion; thirdly, a primary casing 65, formed as an arm or bracket affixed to the lower portion of the member 63 and containing an air-chamber 66, having a valve-seat, said casing having an air-inlet 67, communicating with a branch 68 of the compressed-air conduit 53, and an air-outlet 69 at the opposite side of the valve-seat from the inlet 67; fourthly, a

valve 70, adapted to close on the valve-seat in the chamber 66 and having an upwardly-projecting stem 71; fifthly, a vertical tubular thermostatic member 72, composed of metal, such as brass, having a different coefficient of expansion from the member 63; the tubular member 72 being adapted to engage at its lower end with the valve-stem 71 and at its upper end with an arm or bracket 73, affixed to the upper end of the member 63; sixthly, a compressed-air conduit 74, extending from the outlet 69, and, seventhly, a secondary casing 75, having a diaphragm-chamber communicating with the conduit 74, a diaphragm 76 in said chamber and dividing the same into two parts. The casing 75 has an air-chamber which communicates with the compressed-air conduit 53 from the reservoir. At one end of said chamber is an air-duct 77, surrounded by a valve-seat adapted to be closed by a valve 78, which is normally seated by a spring 79. The conduit 54, which admits the compressed air to the motor, is connected with the conduit 74 as a branch thereof.

80 represents a conduit extending from the air-duct 77 to a motor.

81 represents a relief or vent chamber in the casing 75, said chamber having a vent 83 open to the atmosphere and communicating with the duct 77. In the vent-chamber 81 is a valve 82, adapted to close on a seat formed at one end of the duct 77, said valve 82 being affixed to a stem 85, which extends through the duct 77 and is affixed to the valve 78. The vent-valve 82 bears against the diaphragm 76 and is normally held open by the spring 79, which seats the valve 78.

The thermostatic members 63 and 72 are affected by changes of temperature of the air in the apartment, and when they expand under an increase of temperature they open the valve, so that compressed air is admitted to the motor and to the outer division of the diaphragm-chamber. The air-pressure forces the diaphragm 76 against the vent-valve 82, moving the latter toward its seat and correspondingly opening the valve 78, thus admitting compressed air to the duct 80. When the temperature falls below a predetermined degree, the contraction of the thermostatic members 63 72 permits the spring 66 to move the valve 70 toward its seat, thus shutting off or reducing the air-pressure in the motor and in the diaphragm-chamber and allowing the valve 78 to move toward its

seat, the vent-valve 82 being at the same time correspondingly opened. When the valve 70 is approaching its seat, in consequence of the contraction of the members 63
 5 72 a vent-valve 89, secured to the member 72, opens a vent or outlet 890 and permits the escape of air from the motor and the diaphragm-chamber. The valve 89 is adjustably connected with the thermostat member
 10 72, so that the valve can be adjusted to close and open at any predetermined degrees of temperature. Said adjusting means comprises a screw-threaded stem 87 on the valve 89, said extension being engaged with an internally-threaded plug 88, affixed to the thermostat member 72. The periphery of the
 15 valve 89 may be milled to facilitate its rotation for purposes of adjustment. The plug 88 has a circular enlargement 90, the periphery of which is graduated and marked to aid the operator in adjusting the valve. The upper end of the member 72 is yieldingly held by a spring 91, interposed between a
 20 plug 92 in the member 72 and a plug 93 in the bracket 73, said spring preventing injurious pressure of the valve 89 against its seat, the plug 92 being vertically movable in the bracket and having a flange which is normally pressed by the spring 91 against a
 25 flange in the bracket.
 30 The vent 890 in the thermostat is made considerably smaller than the inlet 67 and the outlet 69 in order that the escape of air through the vent may be slower than its admission through the inlet. This difference
 35 prevents the escape of air through the vent with sufficient rapidity to interfere with the operation of the motor or other device controlled by said thermostat.

40 In the modification illustrated in Fig. 2 the valve 89 is provided with an annular collar 10, fitting within a chamber 11, carried by the threaded stem 87^a, said collar resting upon a threaded plug 12, whereby the same
 45 may be adjusted. The collar 10 is normally held against said plug by a spring 13, whereby injurious pressure upon the valve-seat is prevented.

I claim—

50 1. A device of the character described comprising a casing having an inlet, an outlet, and a vent opening, a valve controlling said inlet and outlet, a valve for said vent
 55 controlling the first-mentioned valve, said valves being in line with each other, said vent-valve being provided with a stem exterior of said casing whereby said valves will conform to any movement of said stem, a thermostat
 60 having a free end, and a threaded member carried by said free end and in direct engagement with said stem, whereby said stem may be adjusted to varying temperatures.

2. A device of the character described comprising a casing having an inlet, an out-

let, and a vent opening, a valve controlling
 65 said inlet and outlet, a valve for said vent controlling the first-mentioned valve, said valves being in line with each other, said vent-valve being provided with a stem exterior of said casing whereby said valves will
 70 conform to any movement of said stem, a thermostat supported at one end by said casing, the other end thereof being free and overhanging said valve-stem, and a threaded member carried by said free end and in direct
 75 engagement with said stem, whereby the latter may be adjusted to varying temperatures.

3. A device of the character described comprising a vertically-arranged support
 80 provided with an overhanging portion, a casing formed integral with said support and provided with inlet, outlet and vent openings, valves controlling said openings, and a longitudinally-expansible thermostat sus-
 85 pended from said overhanging portion and adapted to control said valves.

4. A device of the character described comprising a vertically-arranged support
 90 having an overhanging portion, a casing formed integral with said support and having an inlet, an outlet and a vent opening, valves controlling said openings, a thermostat suspended from said overhanging portion and
 95 controlling said valves, and a relief-spring interposed between said thermostat and an abutting portion of said overhanging portion.

5. A device of the character described comprising a vertically-arranged support
 100 having an overhanging portion, a casing formed integral with said support and having an inlet, an outlet and a vent opening, a valve controlling said inlet and outlet, a valve for said vent controlling the first-men-
 105 tioned valve and provided with a stem exterior of the casing, a thermostat having one end mounted in said overhanging portion, and a threaded member carried by the free end of said thermostat and engaging said
 110 valve-stem.

6. In a heating and ventilating system, a thermostatic fluid-pressure-controlling device comprising a casing having an inlet for the operating fluid, an outlet for said fluid,
 115 a valve between the inlet and the outlet, a vent or outlet to the atmosphere, expansible thermostat members, and a valve for said vent provided with a threaded shank adjustably mounted in one of said thermostat members,
 120 both of said valves being provided with abutting stems.

In testimony whereof I have affixed my signature in presence of two witnesses.

GEORGE A. WELD.

Witnesses:

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