

No. 799,505.

PATENTED SEPT. 12, 1905.

W. WADSWORTH.  
REGULATOR.  
APPLICATION FILED DEC. 9, 1904.

Fig. 1,

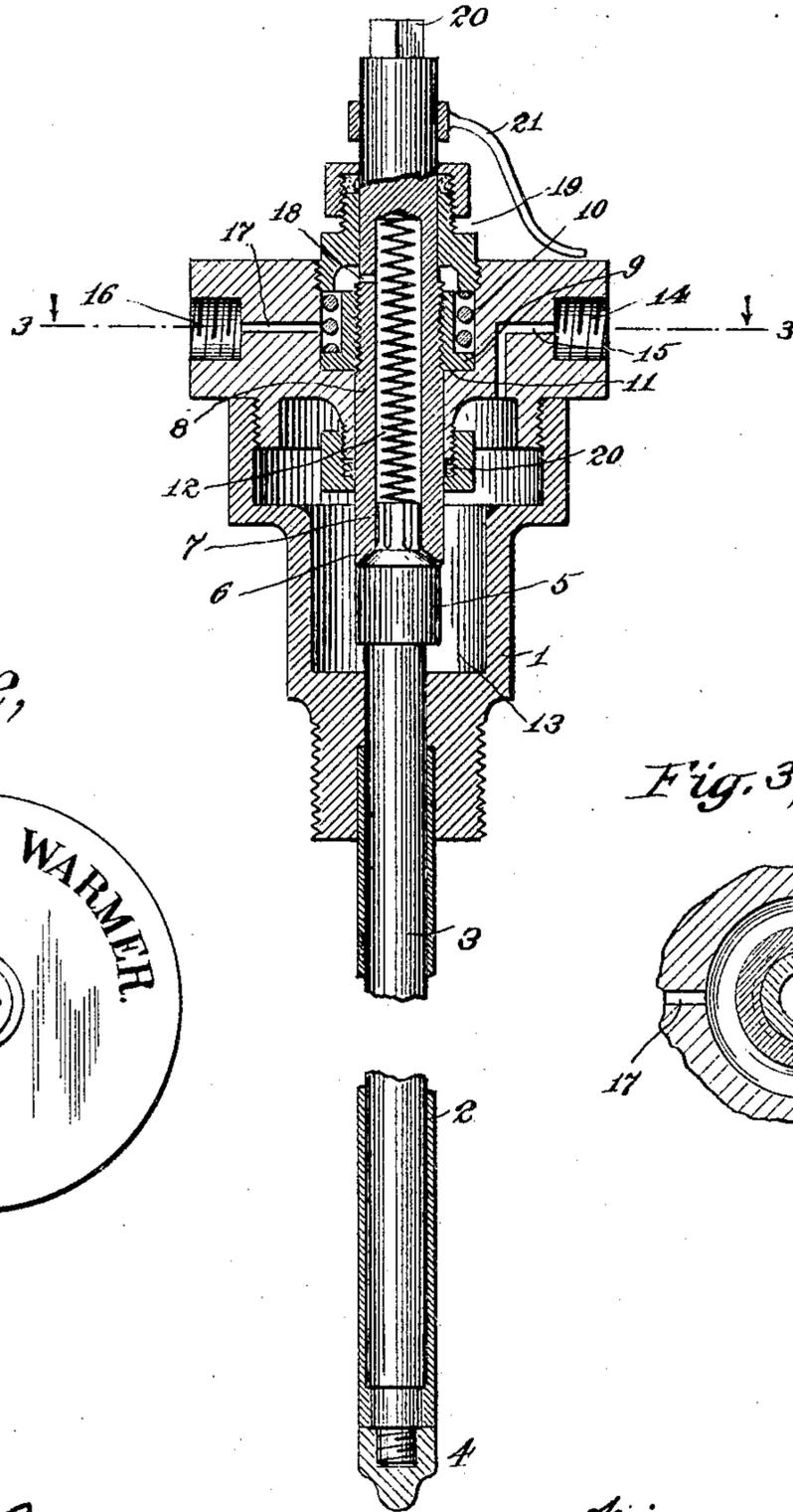


Fig. 2,

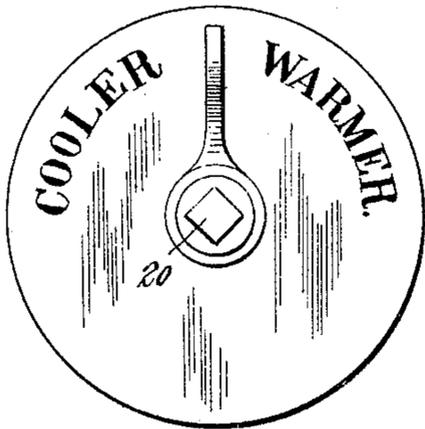
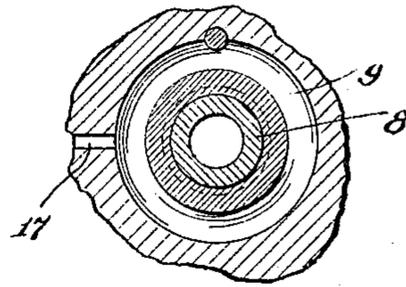


Fig. 3,



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## REGULATOR.

No. 799,505.

Specification of Letters Patent.

Patented Sept. 12, 1905.

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*To all whom it may concern:*

Be it known that I, WILLARD WADSWORTH, a citizen of the United States of America, and a resident of Plainfield, county of Union, and State of New Jersey, have invented certain new and useful Improvements in Regulators, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to improvements in regulators, and particularly to improvements in thermostatic regulators of the type employed for hot-water regulation.

My invention consists in certain novel details of construction and combination of parts, as will hereinafter be more fully pointed out.

In order that my invention may be clearly understood, I will describe an embodiment thereof, with reference to accompanying drawings, illustrating same, and will then point out the novel feature in claims.

In the drawings, Figure 1 is a view in central longitudinal section through a regulator embodying my invention, and Fig. 2 is an end view of same. Fig. 3 is a detail sectional view on the line 3 3 of Fig. 1.

The device comprises a casing 1, to which is attached one end of a tube 2. A rod 3 is arranged within the tube and is secured thereto at the outer end 4 thereof. The connection is a rigid one, unyieldingly connecting the rod and tube together at this end; but the said rod and tube are composed of materials having different coefficients of expansion and are permitted relative longitudinal expansion and contraction whereby their inner ends or the ends opposite to the rigid connection 4 may move with relation to each other.

A valve 5 is arranged at the free end of the rod 3 and is fitted to a valve-seat 6, arranged in a plug 7. The plug 7 is cylindrical in form and is mounted in a cylindrical bore 8 in the casing 1, being fitted thereto with a sliding fit. The plug 7 is provided with an abutment 9, conveniently formed by securing a collar thereon, which abutment engages a stationary portion or shoulder 11 of the casing 1 on one side thereof and is engaged by a compression-spring 10 on the other side. The compression-spring 10 bears at its other end against a portion stationary with the casing, as shown. The action of the spring 10 will then force the plug toward the rod 3 until limited by the engagement of the collar 9 with the shoulder 11.

The plug 7 is preferably made hollow, and a spring 12, lighter than the spring 10, is fitted in the said hollow portion and bears against the inner end of the stem of the valve 5, tending to lift same from its seat.

The valve 5 and its seat are arranged within a chamber 13, inclosed by the casing 1, and a connection 14, leading from a source of fluid-pressure supply, (not shown,) connects with the said chamber through a passage 15. Another connection 16, arranged directly opposite the connection 15, connects, through a passage 17 and port 18 within the interior of the said plug, to the inner or discharge side of the valve and its seat. The said plug is suitably packed at opposite ends, as by packing-boxes 19 and 20, which prevent leakage of motive fluid from the chamber 13 to the connection 16 or from the connection 16 to the atmosphere. The collar 9 is preferably held against turning in the casing, being preferably constructed otherwise than cylindrical in its outer contour and fitted to a correspondingly-shaped recess in the casing, or is splined to the casing, as shown in Fig. 3, or otherwise prevented from turning therein, whereby the relationship of the valve-seat to the valve may be adjusted by merely turning the plug. For this purpose the outer end of the plug is squared, as at 20, for the reception of a key or other turning device, and by this means accurate adjustment may be readily obtained to adjust the apparatus to work at varying temperatures, as may be desired. A pointer 21 may conveniently be secured to the plug and suitable marks denoted on the casing to indicate the adjustment of the device.

In operation the device is suitably arranged with the thermostatic members immersed in the fluid intended to be regulated, which may, for instance, be water. The connection 14 will be connected with a supply of fluid-pressure and the connection 16 with an operating device for controlling the heat of the fluid in which the thermostat is immersed, as aforesaid. The plug and valve-seat carried thereby will be adjusted so that the thermostat will operate at the desired temperature. When the temperature falls below this point, the greater contraction of the tube with respect to the bar 3 will cause the valve to be pressed down to its seat against the resistance of the light spring 12. This will prevent motive

fluid passing valve-seat 14 to the connection 16, and the operating device (not shown) will be relieved of fluid-pressure and will be caused in any well-known manner to admit heat to

5 raise the temperature of the fluid regulated. As the temperature of the fluid in which the thermostat is immersed rises above the pre-determined point the parts will move relatively in an opposite direction, the valve 5

10 being lifted from its seat by spring 12 as the tube 2 expands and draws the rod 3 in a direction away from the seat 6. The fluid under pressure will then be admitted through the connection 14, past the face of the valve,

15 through the port 18 and passage 17 to the connection 16, and thence to the heat-controller, so as to close admission of heat. Should the temperature of the fluid in which the thermostat is immersed fall considerably

20 below the point at which the device is set for closing the valve, further relative contraction between the thermostatic members will force the plug outward against the resistance of the strong spring 10, and this spring there-

25 fore acts as a relief-spring to prevent injury to the parts under abnormal changes of temperature. The spring 10 being much heavier than the spring 12, the former will only act after the valve has been firmly pressed upon

30 its seat, as will be well understood, and the valve-plug will be positively forced back to its normal position before the valve is permitted to lift from its seat.

What I claim is—

35 1. In a regulator, the combination with a casing inclosing a chamber, a tube carried by said casing a bar mounted in said tube and un-

yieldingly connected thereto at its outer end, said tube and bar composed of materials hav-

ing different coefficients of expansion, of a 40 plug yieldingly mounted in said casing and passing from the exterior thereof to the interior thereof into the said chamber, said plug provided at its inner end with a valve-seat,

45 packing means therefor, at the exterior and interior of said casing, and a valve fitted to said valve-seat and engaging said thermo-

50 static bar, said casing provided with inlet and outlet passages, the former a supply-passage leading to the chamber at the interior of said casing and the latter leading through the plug

55 to an outlet connection substantially set forth.

2. In a regulator, the combination with a thermostatically-controlled valve, of a plug having a valve-seat to which said valve is 55 fitted, a relief-spring for said plug whereby said plug will yield under abnormal pressure, and means for longitudinally adjusting said plug substantially set forth.

3. In a regulator the combination with a 60 casing 1 and thermostatic members 2 and 3 secured thereto, of a plug 7 mounted in said casing and provided with a valve-seat, a valve fitted to said valve-seat and operated by said thermostatic members, an adjustable nut or 65 collar threaded upon said plug, and held against turning in said casing, a relief-spring 10, and packing means 19 and 20 for opposite ends of said plug.

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Witnesses:

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