July 1, 1924. 1,499,834

H. A. LUX

THERMOSTAT FOR TYPECASTING MACHINES

Filed Nov. 1, 1922

Fig. 1.

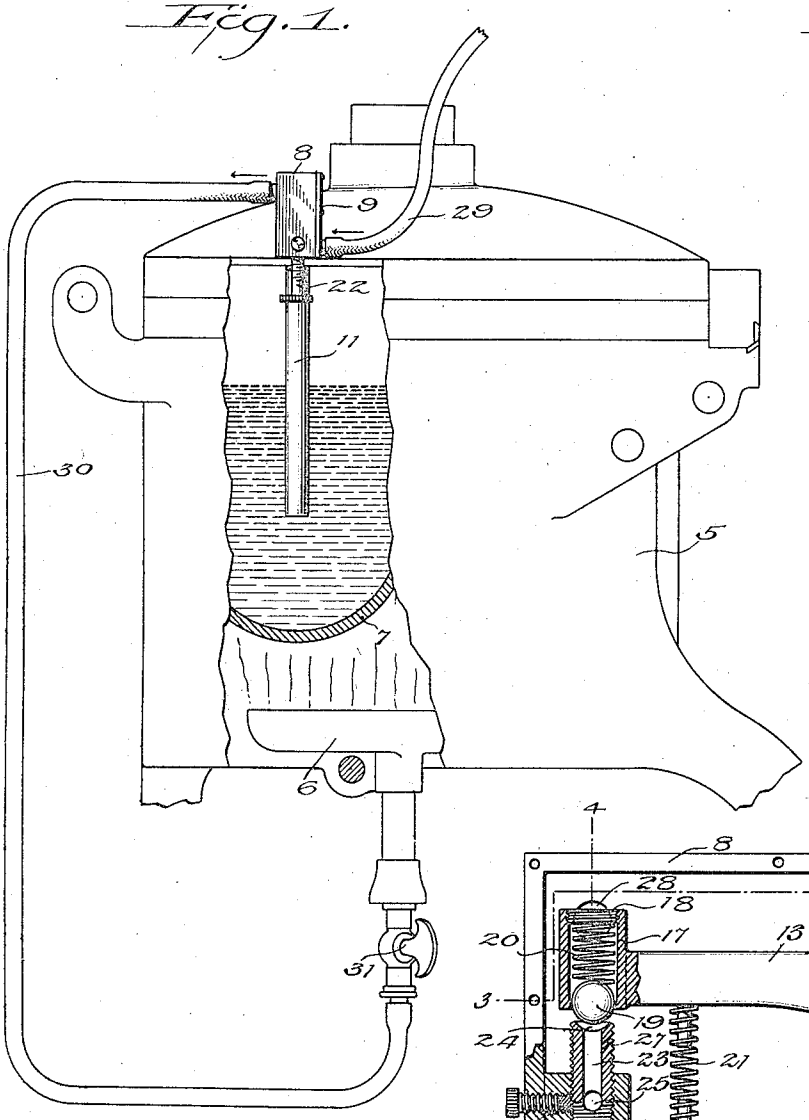


Fig. 4.

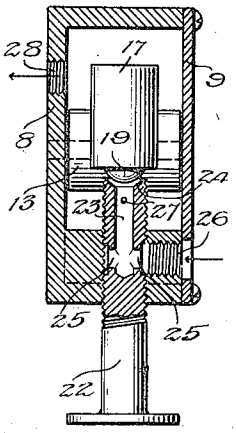
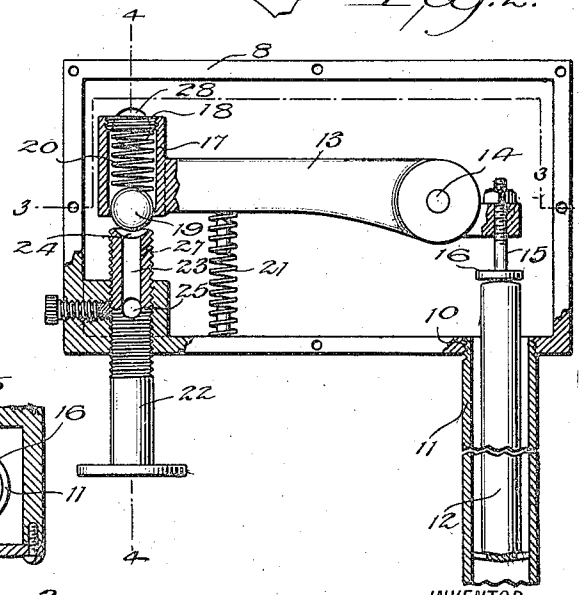


Fig. 2.



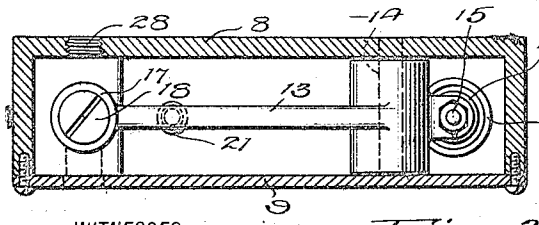


Fig. 3.

WITNESSES

Owen W. Lux

C. L. Mueller

INVENTOR

Henry A. Lux

BY Munn & Co

ATTORNEYS

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UNITED STATES PATENT OFFICE.

HENRY A. LUX, OF BROOKLYN, NEW YORK.

THERMOSTAT FOR TYPECASTING MACHINES.

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To all whom it may concern:

Be it known that I, HENRY A. LUX, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented new and Improved Thermostats for Typecasting Machines, of which the following is a full, clear. and exact description.

This invention relates to improvements in heat regulating devices, and has particular reference to a thermostat employed in connection with type casting machines and the like.

It is well known that thermostats or other controlling devices have heretofore been used for maintaining the molten metal in the pot of a type casting machine at a uniform temperature. This has been done by the use of an element subjected to the heat of the molten metal in the pot and which expands and contracts as the temperature of the metal varies to operate a valve which controls the flow of gas to the burner associated with the pot. In known constructions a rigid connection has been provided between the expansible element and the valve and has occasioned considerable difficulty by reason of the buckling of the expansible element which occurs after the valve controlled by said element is fully closed and the element continues to expand. Also difficulty has been experienced in the control of the flow of gas to the burner in that no provision has been made for keeping the burner constantly lighted regardless of the condition of the valve controlling said flow. It is sometimes necessary for the attendant to leave his machine for a considerable period of time and if, during this interval the valve should be closed by a rise in the temperature of the molten metal, the flow of gas is entirely shut off and the burner extinguished resulting in the cooling of the metal and opening of the valve with a consequent escape of gas.

An object of the present invention is to overcome the above difficulties by providing means for preventing the buckling of the expansible element, and means for keeping the burner lighted when the valve controlling the flow of gas to the burner is entirely closed.

The above and other objects will appear more clearly from the following detail description, when taken in connection with the accompanying drawing, which illustrates a preferred embodiment of the inventive idea.

In the drawing—

Figure 1 is a fragmentary elevation of a conventional melting pot of a type casting machine, partly broken away and shown in section and illustrating the present invention applied thereto;

Figure 2 is an elevational view of the thermostat with the cover thereof removed and showing certain parts thereof in section;

Figure 3 is a sectional view taken on the line 3—3 of Figure 2; and

Figure 4 is a similar view taken on the line 4—4 of Figure 2.

The present invention is designed for use in connection with a melting pot 5 of well known construction, which forms a part of a type casting machine and with which is associated a gas burner 6 positioned below the compartment 7 of the pot which is adapted to contain the molten metal employed for forming the usual slugs.

The thermostat or heat regulating device which comprises the essential features of the present invention, includes a casing 8, preferably of rectangular formation open at one side thereof and provided with a cover 9 which may be removed in order to obtain access to the interior of the casing for the purpose of repairs or replacement of parts. The casing is designed to be mounted upon the top of the pot 5 as shown in Figure 1, and is provided in the bottom and adjacent one end thereof with a screw threaded opening 10 in which a tubular member 11 is mounted, said member depending from the casing and extending through the top of the pot with the lower end thereof immersed in the liquid in the compartment 7. Extending longitudinally of the tubular member 11 and spaced from the side wall thereof is an expansible element 12 made of any suitable material and projecting downwardly into said tubular member a sufficient

distance to be subjected to the heat of the molten metal, whereby said element expands and contracts as the temperature of the metal varies.

A lever or rocking arm 13 is mounted within the casing 8 on a pivot 14 disposed adjacent one end of the lever and extending transversely of the casing. The end of the lever 13 adjacent the pivot 14 carries a screw threaded adjustable retaining member 15 having a flat head 16 adapted to engage the rounded upper end of the expansible element 12 to maintain the same in proper position within the tubular member 11, said member 15 being adjustable for the purpose of regulating the amount of movement of the lever 13 under the influence of the expansion and contraction of said element 12. The opposite end of the lever 13 is provided with a transversely disposed open ended sleeve 17, the upper end of which is closed by means of a screw plug 18, while the lower end is slightly contracted to provide a seat for the ball valve 19 which is normally maintained on said seat by the action of the expansible spring 20 interposed between the valve and the plug 18. A spring 21 is mounted between the lever 13 and the bottom of the casing 8 and acts to normally maintain the lever 13 in a substantially horizontal position and to also constantly keep the head 16 in contact with the upper end of the expansible element 12 so that the lever 13 will be affected by the slightest expansion or contraction of said element.

The end of the casing 8 opposite the end to which the tubular member 11 is connected is provided therein with a vertically arranged adjusting device 22, which is screw threaded into the bottom of the casing so that the same may be vertically adjusted with respect to the valve 19. For a portion of its length the upper or inner end of the adjustable device 22 is provided with a longitudinal passage 23, the upper end of which terminates in a valve seat 24, while the lower end communicates with a plurality of laterally extending openings or ducts 25, any one of which is designed to register with the gas inlet opening 26 formed in the lower portion of the casing of the thermostat. Adjacent the upper end of the adjustable member 22 the same is provided with an escape port 27 communicating at its inner end with the passage 23 to permit of gas flowing through said port into the casing and through the outlet opening 28 therein when the valve 19 is in closing position and in engagement with the seat 24.

In practice the inlet 26 is connected to a suitable source of gas supply by means of a hose or other suitable connection 29, while the outlet end 28 has one end of a suitable connection 30 secured thereto, the other end of said connection being in communication with the burner 6 through the valve 31 which may be employed to extinguish the burner whenever desired. With the parts shown in the position in Figure 2 the gas flows into the casing 8 of the thermostat through the inlet opening 26, one of the openings 25, the passage 23 of the adjusting device and from thence around the valve 19 and through the port 27, through the outlet opening 28 and to the burner 6 which, when lighted, heats the metal within the compartment 7 to bring the same to the proper temperature. As the temperature of the metal rises the heat therefrom acts upon the expansible element 12 to expand the same. The expansion of this element forces the adjacent end of the lever 13 upwardly through the medium of the member 15 thus causing the corresponding downward movement of the opposite end of the lever to move the valve 19 toward the seat 24. When the heat of the metal in the compartment 7 has reached a predetermined temperature, which may be regulated by adjusting the member 22 to move the seat 24 toward and away from the valve 19, said valve engages the seat 24 and thus shuts off the flow of gas through the passage 23 and around the valve into the casing so that the heat from the burner 6 is materially reduced to prevent an excessive rise of temperature of said metal. However, sufficient gas now passes through the port 27 and the outlet opening 28 to keep the burner 6 lighted and thus prevent extinguishment thereof which would otherwise result in the escape of gas after the metal had cooled and the element 12 had contracted sufficiently to again permit of the movement of the valve 19 to open position under the control of the spring 21.

If immediately after the valve 19 has been moved to its closing position on the seat 24 the expansible element 12 should continue to expand the end of the lever 13 in which the valve 19 is supported will have a slight movement relative to the valve by reason of the spring 20 mounted within the sleeve 17 which is contracted by this slight movement and continues to maintain the valve in engagement with the seat 24. It will be obvious that by reason of this relative movement between the lever and the valve the rigid connection between these parts which is usually employed in devices of this character is obviated and therefore the additional expansion of the element 12 will not result in the buckling thereof which sometimes occurs in devices now in use.

What is claimed is:

In a heat regulating device, a casing, an expansible element supported thereby, a movable member in said casing actuated by said expansible element and provided on one end thereof with a transversely ar-

ranged open ended sleeve, one end of which is contracted to form a seat, a removable plug closing the other end of said sleeve, a ball valve in said sleeve engageable with said seat, a resilient member interposed between said ball valve and plug to yieldably maintain said valve in engagement with said seat, and an adjusting device supported by said casing and cooperating with said valve and through which a combustible fluid is permitted to flow into said casing, said device forming a seat for said valve and being adjustable to vary the movement thereof to its closing position when said movable member is actuated in one direction.

HENRY A. LUX.