June 3, 1924. 1,496,614

N. M. BARKER

TEMPERATURE CONTROLLED MECHANISM

Filed Nov. 18, 1920

FIG. 1.

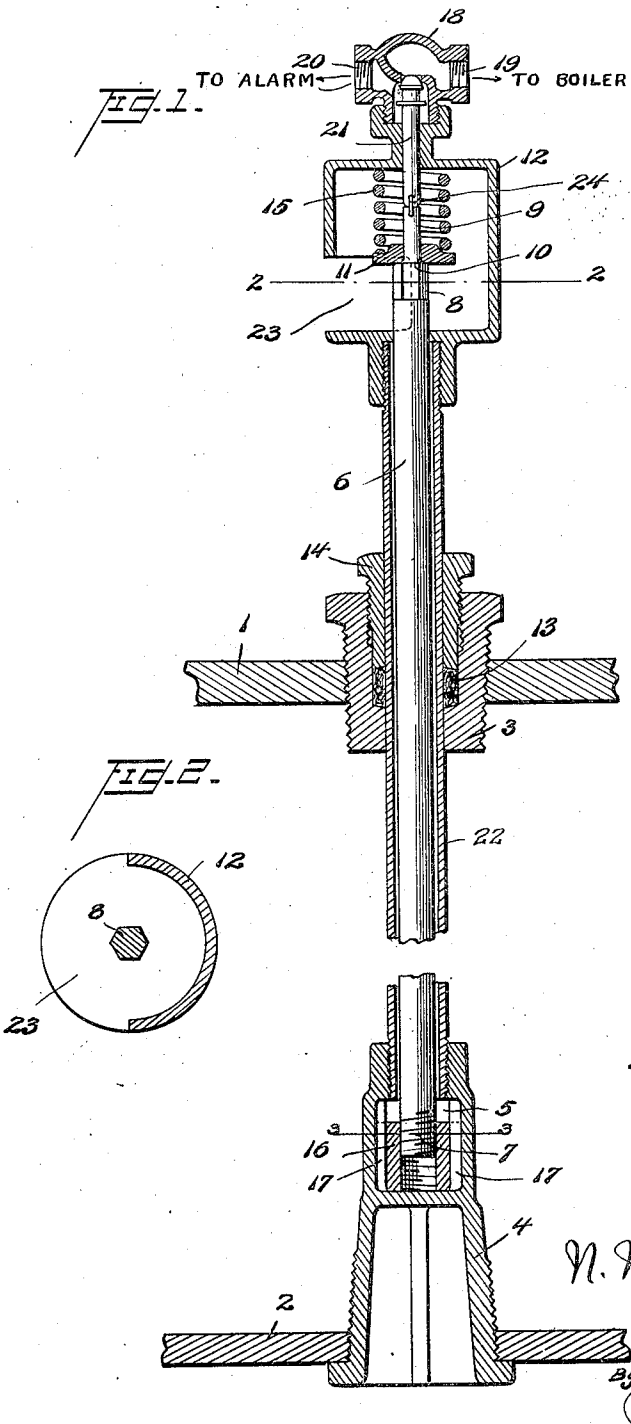
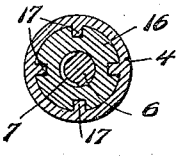


FIG. 2.

FIG. 3.



Inventor

N. M. Barker

By John Boyle Jr

Att'y

Patented June 3, 1924. 1,496,614

UNITED STATES PATENT OFFICE.

NORMAN M. BARKER, OF CLEVELAND, OHIO.

TEMPERATURE-CONTROLLED MECHANISM.

Application filed November 18, 1920. Serial No. 424,857.

To all whom it may concern:

Be it known that I, NORMAN M. BARKER, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Temperature-Controlled Mechanism, of which the following is a specification.

My invention relates to a temperature controlled mechanism and one of the objects of the invention is to provide a device of this character which will set in operation certain mechanism at a predetermined temperature.

One of the specific applications of my invention is in connection with a low water alarm for boilers, which when the level of the water in the boiler becomes too low, a fusible plug will be melted which will thereupon cause mechanism to operate to permit the passage of steam from the boiler to an alarm whistle, to the feed water pump or to any of the other suitable mechanism which it is desirable to operate under such conditions.

Another object of the invention is to provide a device of this character which can be readily reset when the water has again reached a safe level in the boiler and without the necessity of renewing the fusible material. With these and other objects in view, my invention consists of certain novel and peculiar features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the claims.

In the accompanying drawings—

Fig. 1 is a vertical section showing the invention in position in a boiler.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Referring more particularly to the drawings, 1 is the roof sheet of a boiler. Tapped into the roof sheet is a plug 3 and tapped into the crown sheet is the plug 4 provided with a chamber 5 for holding fusible material. The operating plunger 6 is provided on its lower end with a screw thread 7, and on its upper end with a hexagonal portion 8 adapted to fit a wrench, and with a reduced portion 9 to provide a shoulder 10 upon which the collar 11 may be supported. Threaded on the upper end of the plug 4 is the tube 22 which is in tight but expansible engagement with the plug 3, and which is threaded at its upper end to receive the housing 12. For making a steam tight connection between the plug 3 and the tube 22, I provide a packing 13 held in position by the gland 14. Interposed between the collar 11 and the top of the housing 12 is the compression spring 15 which exerts a continuous downward pressure on the operating plunger 6. In engagement with the lower threaded end of the stem 6 is the fusible material 16 which partially fills the receptacle 5 of the plug and is held from rotation by the fins 17 on the inside of the receptacle. Secured to the upper end of the housing 12 is a conventional valve 18, provided with an entrance 19 for steam from the boiler and an exit 20 leading to an alarm whistle, to the boiler feed pump throttle, or to any other suitable mechanism which it may seem desirable to operate. In engagement with the upper end of the operating stem 6 is a valve stem 21 for controlling the passage of steam from the boiler to the units desired to be operated. For assuring that the valve stem 21 will positively move downwards with the plunger 6, a spring clasp connection 24 may be employed although this is not deemed essential. The fusible material employed and found to be the most satisfactory is Banca tin; this necessitates, however, using for the plunger a material which will not tend to fuse together with the tin and prevent turning of the screw. For this reason, at least the screw threaded end of the plunger is made of iron.

While the fins 17 in the chamber 16 prevent relative rotation of the plug and fusible material, they also have the additional function of heat conducting fins for efficiently transmitting the heat from the water or steam to the fusible material.

The operation of my invention is as follows; in the normal operation of the boiler the parts are in position shown in Fig. 1. When the level of the water in the boiler drops below a certain level the higher temperature to which the fusible material is then subjected melts the fusible material and under pressure of the spring 15, the plunger 6 moves downward. This permits the valve 18 under pressure of the steam to open, the steam passing to the alarm whistle, boiler feed pumps or other suitable operating units. When the temperature of the fusible material is reduced by the water

reaching the proper level in the boiler, the fusible material solidifies around the screw threaded end of the operating plunger. To reset the device for future operation, a wrench is inserted through the opening 23 in the housing to engage the hexagonal end 8 of the operating stem. On turning the operating stem, on account of its threaded engagement with the fusible plug, it will be elevated against the pressure of the spring 15 to move the valve stem to closed position and thus shut off the passage of steam from the boiler to the alarm. The device is then in position for renewed operation. It will be noted that it is not necessary to renew the fusible material after each operation; that the boiler is not temporarily put out of commission, and that the device can be reset from the outside without affecting the normal operation of the boiler.

While I have described my invention as applied to a boiler for a low water alarm, it is not my intention to limit its use to such application, but that it shall be of general application. Such other uses will readily suggest themselves to those skilled in the art.

I claim:

1. In a device of the character described, a body provided with fusible material, a member having a screw threaded part in engagement with the fusible material, means for immersing the said part in the fusible material when the said fusible material melts, and means for withdrawing the screw threaded part after solidification of the fusible material by the relative rotation of the member and the plug.

2. In a device of the character described, a body for holding fusible material, a member in engagement with the fusible material, and adapted to move when the fusible material melts, and screw threaded means on the fusible material for resetting the said member after solidification of the fusible material.

3. In a device of the character described, the combination of an operating member, means including a body of fusible material for supporting the said member in a predetermined position, means for moving said member to displace the material of said body when the latter is fused, and means including the said body for moving the same member to its original position when the said material has re-solidified.

4. In a device of the character described, the combination of an operating member, a body of fusible material for supporting the said member in a predetermined position, means operative by the fusion of the material of said body for moving the said member and for immersing it in the material of such body, and means cooperating with such body to form a thread therewith upon the resolidification of the material of said body.

5. In a device of the character described, the combination of an operating member, a body of fusible material for supporting the said member in a predetermined position, means operative by the fusion of the material of said body for moving the said member and for immersing it in the fused material of such body, thereby forming a thread on the resolidified body, and threaded means cooperating with the thread formed on said body whereby the rotation of the said member will enable the latter to be moved to its original position.

6. In a device of the character described, the combination of a receptacle, a body of fusible material in said receptacle, a member supported by said body in a predetermined position, means for moving said member to displace the material of said body when the latter is fused, the said member having a thread thereon adapted to cooperate with the said body, when the latter is resolidified, to permit the return of the member to its initial position by rotary movement of said member.

In testimony whereof I affix my signature.

NORMAN M. BARKER.