

Oct. 14, 1924.

1,511,978

J. J. MUHLEBACH
SAFETY DEVICE FOR BOILERS
Filed March 28, 1923

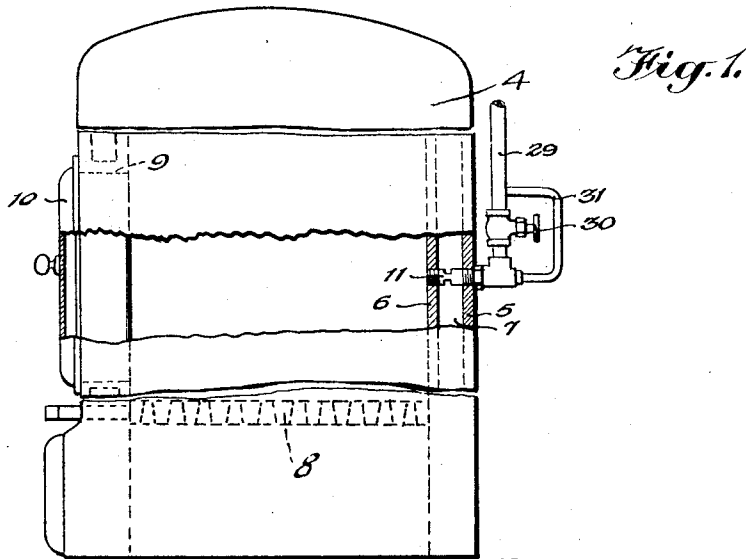


Fig. 1.

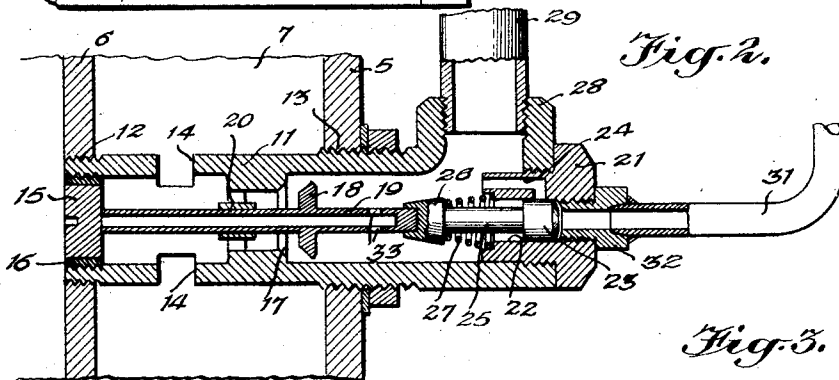


Fig. 2.

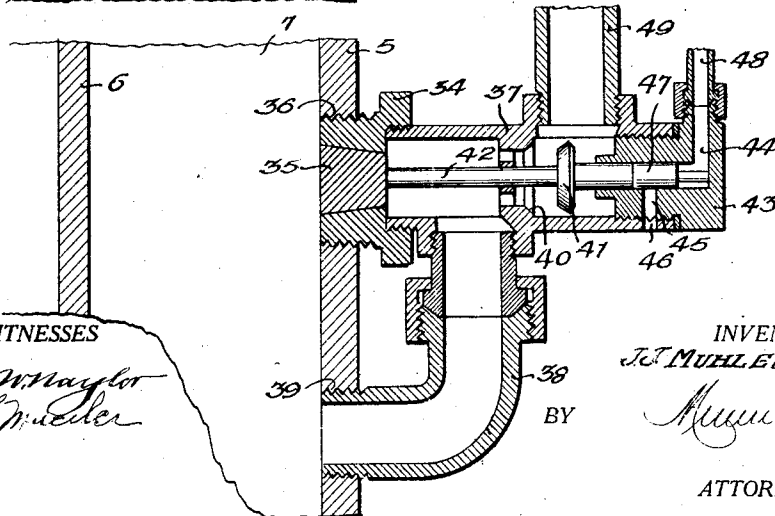


Fig. 3.

WITNESSES

Geo. W. Taylor
E. L. Mueller

INVENTOR

J. J. MUHLEBACH

BY

Muhlebach

ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN J. MUHLEBACH, OF NEW YORK, N. Y.

SAFETY DEVICE FOR BOILERS.

Application filed March 28, 1923. Serial No. 628,379.

To all whom it may concern:

Be it known that I, JOHN J. MUHLEBACH, a citizen of the United States, and a resident of the city of New York, Far Rockaway, borough of Queens, in the county of Queens and State of New York, have invented a new and Improved Safety Device for Boilers, of which the following is a full, clear, and exact description.

This invention relates to improvements in boilers, and has particular reference to a safety device therefor.

The present invention is especially designed as an improvement on the construction illustrated and described in my previous application, Serial Number 617,132, filed February 5th, 1923. In said application the safety device is so constructed and mounted that it is necessary to open the valve which controls the flow of water to the compartment of the boiler before any indication will be given as to the condition of the water within said compartment.

An object of the present invention is to provide a safety device which will operate, when the level of the water in the water compartment falls below a predetermined point, to indicate such low level irrespective of the condition of the valve which controls the supply of water to said compartment.

Another object is the provision of a device which, when operated by the falling of the level of water in the water compartment below a predetermined point, will divert the water supply for said compartment to the floor surrounding the boiler without passing through the walls of the latter.

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

In the drawing—

Figure 1 is a fragmentary side elevation of a boiler, partly broken away and shown in section, illustrating one form of the present invention;

Figure 2 is an enlarged longitudinal section through the safety device shown in Figure 1; and

Figure 3 is a view similar to Figure 2, showing a different form of the invention.

Referring to the drawing, the numeral 4 indicates a boiler of any well known construction including the outer wall 5 and the

inner fire box wall 6 spaced from said wall to form the water compartment 7. The boiler further includes the usual grate 8 and door opening 9 closed by the door 10.

It is proposed in the present invention, as in my previous application above referred to, to arrange the safety device so that when the same is operated upon the level of the water falling below a predetermined point in the water compartment 7, the supply for said compartment will automatically be shut off and diverted through the body to points exterior of the boiler to indicate such low level in the water compartment. As previously indicated above, this latter result could only be accomplished, in my previous application, by opening the valve which controlled the inlet pipe from which the supply of water is fed into the water compartment. In the present invention, this result may be accomplished whether said valve be opened or closed, thus rendering the device more efficient in its operation.

In the form of the invention shown in Figures 1 and 2, the water is diverted from the water compartment and projected through the body of the device, when said device is operated, in the same manner as described in connection with my previous application, that is, the water will flow through the device and over the grate and toward the door opening 9. Thus part of the water will fall onto the fire, at least partially reducing the temperature thereof, and some of the water will either pass through the door opening 9 and onto the floor surrounding the boiler, or impinge against the door 10, if said door is in closed position. In the latter instance, some of the water will flow over the front of the boiler adjacent the door opening and the remainder will fall back onto the grate 8.

The safety device, as illustrated in Figures 1 and 2, comprises a body 11 having its inner screw threaded end mounted in an opening 12 formed in the wall 6 at the rear of the boiler and its intermediate screw threaded portion engaged in a similar opening 13 in the outer wall 5. The portion of the body 11 thus disposed within the water compartment 7 is provided with oppositely disposed openings 14 through which water will flow from the body 11 into the water compartment when it is desired to replenish the supply therein. The inner end of the body 11 is normally closed by a plug 15 made of any desirable material

and secured in place in said inner end by some suitable fusible material 16, such as solder. At a point intermediate the ends of the body and outwardly of the openings 14, said body is provided interiorly thereof with a valve seat 17 adapted to be closed, to shut off the supply of water to the water compartment 7, by a normally inoperative valve 18, preferably formed integrally with a feed pipe 19 slidably mounted in a bearing 20 and having its inner end engaged with the plug 15. The outer end of the body 11 has mounted therein a bushing 21 provided with a longitudinal opening 22 in which is slidably mounted a valve 23 which normally closes the inlet end of a by-pass 24 formed in said bushing. The valve 23 has a stem 25, the inner end of which is provided with an enlargement 26 to which the outer end of the feed pipe 19 is connected in any suitable manner. A coil spring 27 is interposed between the inner end of the bushing 21 and the enlargement 26 and exerts a rearward pressure upon said enlargement to constantly maintain the inner end of the pipe 19 in engagement with the plug 15.

The outer end of the body 11 is also provided with a lateral extension 28 having a screw threaded opening for receiving one end of an inlet pipe 29 having a valve 30 for controlling the flow of water from said pipe into said body and from thence into the water compartment when the safety device is in its normal condition.

The valve 30 is interposed between the body 11 and one end of a by-pass pipe 31 connected to the inlet pipe 29, the other end of said by-pass pipe being connected to a nipple 32 mounted in the bushing 21. By thus arranging the by-pass pipe 31, a portion of the water from the inlet pipe will be diverted around the valve 30 and through said by-pass pipe to exert a continuous pressure upon the valve 23 which normally prevents the flow of water through the by-pass 24.

Should the level of the water in the water compartment fall below the body 11 and thus expose the plug 15 to the action of heat from the fire on grate 8, it will be obvious that the fusible material 16 will be rapidly fused by said heat, whereupon the plug 15 will be dislodged by the combined pressure of the spring 27 and the water impinging against the forward end of the valve 23. This pressure will cause the feed pipe 19 and valve 23 to be moved inwardly until the valve 18 engages the valve seat 17 to close communication between the inlet pipe 29 and the water compartment. When the valve 23 has moved sufficiently to uncover the adjacent end of the by-pass 24, the water flowing through the pipe 31 will enter the body 11 through said by-pass 24 and will then pass through openings 33 formed in the forward end of the

feed pipe 19. The water thus entering said feed pipe under constant pressure, irrespective of the condition of the valve 30, will be projected through said pipe, over the grate 8 and toward the door opening 9, as previously described.

In the form of the invention shown in Figure 3, it is proposed to utilize the steam generated in the water compartment to cause the operation of the safety device when the level of the water in said compartment falls below that of said device. Also, contrary to the construction shown in Figure 2, it is further proposed to divert the water from the water compartment when the device is operated and project it through the body and directly onto the floor surrounding the boiler instead of over the grate and toward the door opening. Therefore, instead of extending the body of the device through the outer and inner walls 5 and 6, a fusible plug including the shell 34 and central portion 35 of fusible material is mounted in a screw threaded opening 36 formed in the wall 5. The body 37 of the device then has its inner end suitably mounted in the shell 34 and communication between the body and the compartment 7 is established through an elbow 38, one end of which is connected to the body and the other end threaded in an opening 39 in the wall 5. At a point contiguous the connection of the elbow 38 with the body the latter is provided with a valve seat 40 designed to be closed by a normally inoperative valve 41 carried by the valve stem 42, the inner end of which engages the fusible plug, while the outer end is slidably mounted in the bushing 43 supported by the outer end of the body 37. The bushing 43 is provided with a passage 44 which communicates with a port or by-pass 45 in said bushing, said port in turn registering with an opening 46 formed in the body 37. A valve 47 is slidably mounted in the bushing 43 and normally closes the port 45 so that water in the by-pass pipe 48, similar to the pipe 31, will be prevented from flowing through said port 45. The by-pass pipe 48 is connected to the valve-controlled inlet pipe 49 in the same manner as illustrated in Figure 1.

From the foregoing description, it will be obvious that when the water in the compartment 7 falls below the level of the fusible plug the portion of the wall 5 surrounding the plug will become overheated to such an extent as to fuse the material 35, whereupon the pressure of water in the by-pass pipe 48 against the valve 47 will cause the latter valve to move inwardly imparting a similar movement to the valve 41, which then engages the seat 40 to close communication between the inlet pipe 49 and the elbow 38 through the body 37. The inward movement of the valve 47 uncovers the port or by-pass 45 and thus permits the

water to flow from the by-pass pipe 48 through said port and the opening 46 onto the floor surrounding the boiler. It will be apparent that this action takes place whether the valve controlling the inlet pipe 49 is opened or closed.

What is claimed is:

1. In a safety device for boilers, a body normally having communication with the water compartment of a boiler, a valve-controlled inlet pipe for feeding water through said body into said compartment, a normally closed by-pass pipe connecting said inlet pipe with said body, and means in said body operable upon the level of water in said compartment falling below a predetermined point for closing communication between said inlet pipe and compartment and for opening said by-pass to permit water to flow through said body without entering said compartment.

2. In a safety device for boilers, a body normally having communication with the water compartment of a boiler, two inlet pipes communicating with said body, a valve in one of said pipes for controlling the flow of water through said body into said compartment, means in said body for normally closing the other inlet pipe, and means in said body operable when the water in said compartment falls below a predetermined level for closing communication between the first named pipe and said compartment and for causing the last named means to open the second named inlet pipe to permit water to flow therefrom through said body irrespective of the condition of said valve.

3. In a safety device for boilers, a body having communication with the water compartment of a boiler, an inlet pipe from which water is fed through said body into said compartment, a member movable longitudinally of said body, a valve carried by said member for controlling the flow of water into said compartment, fusible means carried by said body for normally retaining said member and valve in inoperative position, means for moving said member and valve to operative position to stop the flow of water into said compartment when said fusible means is fused, and a by-pass connecting said inlet pipe and body for permitting the water to pass through said body when said valve is in its operative position.

4. In a safety device for boilers, a body having communication with the water compartment of a boiler, an inlet pipe from

which water is fed through said body into said compartment, a valve for controlling the passage of water through said inlet pipe, a member movable longitudinally of said body, a valve carried by said member for controlling the flow of water into said compartment, fusible means carried by said body for normally retaining said member and the second named valve in inoperative position, means for moving said member and valve to operative position to stop the flow of water into said compartment when said fusible means is fused, and a by-pass for said inlet pipe for permitting the passage of water through said body when said second named valve is operated irrespective of the condition of the valve controlling said inlet pipe.

5. In a safety device for boilers, a body having communication with the water compartment of a boiler, an inlet pipe for feeding water through said body into said compartment, a by-pass pipe connecting said inlet pipe with said body, means for controlling the flow of water through said inlet pipe and through said body into said compartment and for preventing the flow of water from said by-pass pipe into said body, and means in said body operable when the level of water in said water compartment falls below a predetermined point for permitting the pressure of water in said by-pass pipe to operate the last named means to shut off communication between said inlet pipe and compartment and establish communication between said by-pass pipe and body.

6. In a safety device for boilers, a body having communication with the water compartment of a boiler, an inlet pipe for feeding water through said body into said compartment, a normally inoperative valve in said body for controlling said feed, a member carried by said body and having a normally closed by-pass through which water may be projected through said body, a by-pass pipe for establishing communication between said inlet pipe and said by-pass, a second valve operable with the first named valve and normally closing the communication between said by-pass pipe and by-pass, and means operable when the water in said compartment falls below a predetermined level for permitting the first named valve to move to operative position and the second named valve to inoperative position.

JOHN J. MUHLEBACH.