

UNITED STATES PATENT OFFICE.

PHILO J. LOCKWOOD, OF WASHINGTON, DISTRICT OF COLUMBIA.

SAFETY DEVICE FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 768,384, dated August 23, 1904.

Application filed March 29, 1904. Serial No. 200,566. (No model.)

To all whom it may concern:

Be it known that I, PHILO J. LOCKWOOD, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Safety Devices for Boilers, of which the following is a specification.

My invention relates to that class of safety devices for steam-boilers in which a plug of fusible metal is depended upon to fuse and open a passage or channel when the water descends below a predetermined level or the heat is excessive; and my invention consists in a device in which the fusible plug is so insulated from its support as to prevent the rapid convection of heat from the plug to the support, as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view illustrating one form in which my invention may be embodied. Fig. 2 is a plan of Fig. 1. Figs. 3 and 4 are sectional views showing other embodiments of my improvement. Fig. 5 is a sectional view of the lower part of a water-gage, showing my improved device applied thereto. Fig. 6 is a view illustrating different arrangements of tubes or supports for the device in connection with a steam-boiler.

In carrying out my invention I make use of a fusible plug 1 of any suitable material, preferably of a composition which will fuse at any heat at which steam may exist under working pressure in a boiler. With this plug is provided a suitable support 3, which may be of any suitable construction, but which, as shown, is in the form of a screw plug or block, and at some point between the plug and this block there is interposed an insulating material 2 of such character as will prevent the heat from passing rapidly from the plug to the holder and to the supporting tube or casing or other part in which the holder is fixed.

In the most simple form shown in Figs. 1 and 2 the holder or block 3 has a tapering socket 6, and the plug 1 fits a socket in a sleeve or ring 2, of vulcanized fiber, which is exteriorly adapted to said socket.

In the construction shown in Fig. 3 the socket for the ring 2 is at the end of a tubu-

lar extension 4 of the holder, secured to or forming part thereof.

In the construction shown in Fig. 4 the extension 5 is separate from the holder 3, and the insulating material or ring 2 is interposed between the extension 5 and the holder.

Whatever may be the construction and arrangement of the above-described parts the heat imparted to the fusible plug on the increased temperature resulting when the water in the boiler descends so low that steam can pass to the plug is retained and will not pass rapidly by convection to the holder, and as a result the plug will melt almost immediately upon steam passing into contact therewith. As a result of thus preventing the convection of heat from the plug to the holder those accidents are prevented which frequently occur when the plug is not insulated, for it has been found that in such cases, except when the steam is at high temperature, the heat is conveyed so rapidly from the steam by the mass of metal surrounding the plug that the steam is either condensed, surrounding the plug with water, or it is so reduced in temperature that the plug will not fuse until the boiler becomes dry or nearly so. The holder, with its plug, may be constructed in any suitable manner for application to the boiler or to any pipe or casing communicating therewith, Fig. 6 illustrating three arrangements which may be employed. In one the holder is at the end of an inclined tube 8, passing through the outer shell of the boiler. In another it is supported in a vertical tube 9, connected with a bend 10, communicating with the boiler, and in another it is at the end of an L-shaped pipe 12, the vertical portion of which extends upward into the boiler, the communication of the support in all cases being with the boiler at the low-water level.

In Fig. 5 the holder is illustrated as applied to a casing 13, which is the support for the lower end of a water-gage 14.

In each of the cases illustrated the holder has of course a channel or perforation 15, through which water can pass when the plug melts.

It will be seen that in addition to being insulated from the support the plug is held out

of immediate contact therewith and at such a distance therefrom that the heat cannot pass readily to said support. I, however, do not here claim this, as it is the subject of a separate application, Serial No. 184,804.

Without limiting myself to the construction shown, I claim—

1. A safety device for steam-boilers consisting of a fusible plug, a holder therefor, and means for insulating the plug from the holder to prevent the convection of heat from the plug to the holder, substantially as set forth.

2. A safety device for steam-boilers consisting of a fusible plug, a holder therefor, and a tube having a socket for the plug and

insulated from the holder, substantially as set forth.

3. The combination of a holder consisting of a threaded block and a fusible plug insulated from the block, substantially as set forth.

4. The combination with a casing connected with a steam-boiler, of a holder, a fusible plug, and an interposed insulating material, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PHILO J. LOCKWOOD.

Witnesses:

CHARLES E. FOSTER,
EVELYN PADGETT.