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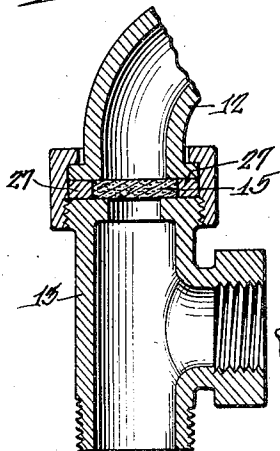
L. D. LOVEKIN

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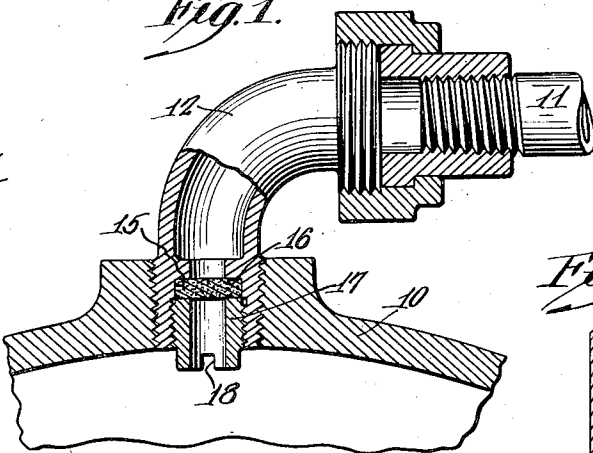
FUSIBLE PLUG WATER RELEASE

Filed Oct. 20, 1927

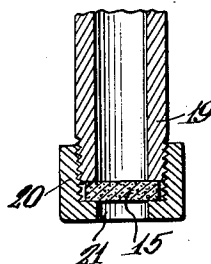
*Fig. 4.*



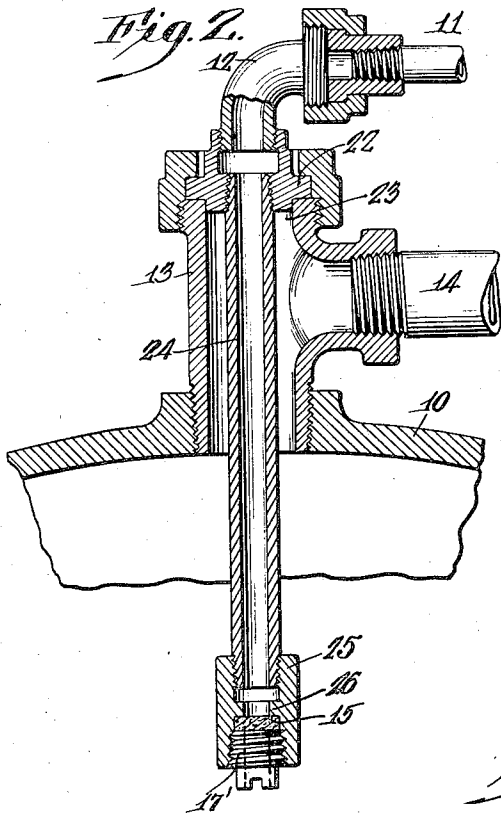
*Fig. 1.*



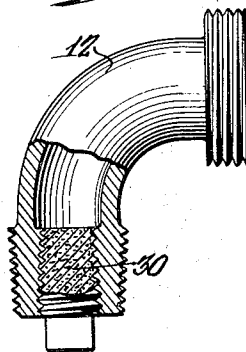
*Fig. 5.*



*Fig. 2.*



*Fig. 3.*



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## UNITED STATES PATENT OFFICE

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## FUSIBLE-PLUG WATER RELEASE

Application filed October 20, 1927. Serial No. 227,391.

My invention relates to a heat element adapted to fail if subjected to abnormally high temperature and to a desirable automatic safety relief for domestic boilers or the like.

A purpose of my invention is to provide a domestic water heater or the like with an automatic safety relief to waste, operative by failure of a heat-weakened element to relieve the dangerously high fluid pressure incident to abnormally high temperature and with normal systems to permit replacement of some of the very hot water in the heater by water from the cold water supply line.

I close the inlet to a waste pipe connection with my heat element, usually making the connection from the top of a boiler, desirably with a T fitting that provides outlet from the boiler into the hot water supply pipe of the house, and may desirably mount the heat-weakened element between adjoining members of a union at the inlet end of the waste pipe.

A further purpose is to cut heat-weakened element discs from a bar of fusible metal and to accommodate the thickness of the discs to the area of outlet and the pressure to which the discs may be subjected, and am thus enabled to obtain discs inexpensively that have superior and definite characteristics as compared to those of the molded elements of the prior art.

A further purpose is to clamp a heat-weakened element disc to place against a shoulder in the hot water inlet of a discharge pipe by means of a sleeve threaded into the inlet and preferably provided with slots on opposite sides for screwing in or unscrewing the sleeve.

Further purposes will appear in the specification and in the claims.

I have preferred to illustrate my invention in a few forms only selecting forms that are practical and convenient in operation and which well illustrate the principles involved.

Figure 1 is a fragmentary sectional elevation showing one form of my invention applied to a domestic boiler or the like using an individual connection into the boiler for the relief pipe.

Figure 2 is a fragmentary sectional elevation showing the form in which the inlet to my relief pipe is supported from a T fitting providing hot water outlet from the boiler.

Figures 3 and 4 are fragmentary sectional elevations corresponding generally to Figure 2 but showing modified forms.

Figure 5 is a fragmentary partly sectioned detail showing a different mounting for the heat-weakened element from that of Figure 2.

Like numerals refer to like parts in all figures.

Describing in illustration and not in limitation, and referring to the drawings:—

My invention is intended particularly to protect hot water boilers, tanks and other containers against excessive pressures incident to overheating from any cause and accompanied by abnormally high temperature within the boiler.

In the illustration a heater 10 may comprise any fluid heater, usually the water heater of a domestic heating system.

In many systems any overheating in the boiler may result in excessive and dangerous pressure in the boiler. Normally overheating is intended to be prevented by suitably regulating the fuel supply, but sometimes regulation fails and in this event pressures inside the boiler may become dangerously high, the dangerously high pressure being caused by the abnormally high temperature.

To prevent this danger I make a safety waste pipe connection from a hot part of the boiler, and close the inlet from the boiler to the waste pipe with a fusible element adapted to fail at an abnormally high temperature corresponding to an undesirable high pressure.

I preferably use a disc form of fuse element

each disc being a section cut from a bar, and am thus enabled to attain a uniformity and definiteness in the properties of the element and a cheapness and ease of manufacture that have not been possible with the moulded elements of the prior art.

In the figures 10 may be any suitable type of fluid heater. A waste or discharge pipe 11 is connected to the heater by means of a suitable fitting 12 shown in the figures as an L union but which may obviously be straight or without union if desired.

In Figure 1 the L threads directly into the boiler while in Figure 2 it is threaded into a union at one of the outlets of a T 13 connecting the boiler to a hot water supply pipe 14 of the house.

If desired the L may be threaded directly into the top of the T in the same way that it threads into the boiler at Figure 1.

In Figure 1 the inlet end of the L is counter-bored and internally threaded and my heat-weakened element disc 15 is held against the shoulder 16 at the end of the counterbore, by a sleeve 17 threaded into the open end of the fitting.

Desirably the sleeve 17 projects beyond the end of the L and is suitably slotted at 18 upon opposite sides to provide a grip for a screw-driver blade for screwing the sleeve in or out.

In Figure 5 the heat-weakened element disc 15 is held to place against the end of the nipple 19 by means of a cap member 20 having a central bore 21 of any desired size.

The size of the bore through the cap determines the rate of discharge if the heat-weakened element should fail and it should be sufficiently large but preferably no larger than that to insure adequate relief in the event of heat-weakened element failure.

The outlet end of the discharge pipe 11 is desirably located where any discharge may be visible so that a glance at the end of the pipe may determine whether or not the heat-weakened element is properly sealing the pipe from discharge.

In Figure 2 the L threads into the upper end of a union member 22 connecting to one of the outlets 23 of the T feeding the hot water supply line of the house and an outlet nipple 24 adapted to pass longitudinally through the T is threaded at its upper end into the lower end of the union member 22.

The mounting for the heat-weakened element in Figure 2 comprises a sleeve 25 threaded upon the inlet end of the nipple 24 and having an intermediate interior flange 26. The heat-weakened element is seated upon the flange 26 and held to place by a sleeve 17 similar to the sleeve 17 of Figure 1.

In Figure 4 the union end of the L makes union connection with the top of the T and the heat element 15 is clamped between the opposing members of the union, a suitable compressible gasket 27 being provided to

maintain tightness at the union irrespective of any failure of the heat-weakened element.

I much prefer to use a disc form of heat-weakened element, and a disc comprising a section cut from a bar of the fusible material.

Obviously, however, other forms of heat-weakened elements may be used, and I illustrate this in Figure 3 where the heat element comprises a plug 30 threaded into the end of the L.

Usually material adapted to fail at the temperature which corresponds to a pressure beginning to become dangerously high is not adapted to machine into a threaded plug so that the plug form of Figure 3 will usually be melted and moulded to place in the taper of the service fitting and then be screwed tight.

In operation the discharge pipe does not function unless some abnormal condition arises permitting excessive heating within the heater. Such a condition might be due to failure of a thermostatic control to correctly operate or to any cause whatever.

In the event of such excessive heating the temperature and the pressure inside the boiler both become abnormally high until finally the heat-weakened element disc fails, with or without fusion, permitting a discharge of water from inside the heater through the pipe 11 which I have called a waste pipe in that it will in practice nearly always be adapted to discharge to waste and which in any event is a discharge pipe so far as the boiler is concerned.

This discharge relieves the pressure and also normally brings cold water from the cold water supply line to replace that running away to waste through the pipe 11.

The abnormal condition for example at a thermostatic regulator, must be corrected and a new fusible element inserted before again operating the boiler.

In view of my invention and disclosure variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain all or part of the benefits of my invention without copying the structure shown, and I, therefore, claim all such in so far as they fall within the reasonable spirit and scope of my invention.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. A fluid heater adapted to supply hot water, a branching outlet fitting therefrom, a hot water supply pipe from one of the branches a waste pipe from another of the branches and a heat-weakened element in the inlet of the waste pipe adapted to fail if subjected to an abnormally high temperature.

2. A water heater, a T outlet fitting open to the boiler at one end, a hot water supply pipe

from one branch of the T, a removable discharge pipe mounted in the other end of the T having an inlet inside the boiler and a heat-weakened element normally closing the inlet end and adapted to fail if subjected to abnormally high temperature.

3. A fluid heater, a branching outlet fitting therefrom, a hot water supply pipe from one of the branches, a union at another branch, a waste pipe having inlet from the branch at the union and a heat-weakened element supported in the inlet adapted to fail if subjected to abnormally high temperature.

LUTHER D. LOVEKIN.