

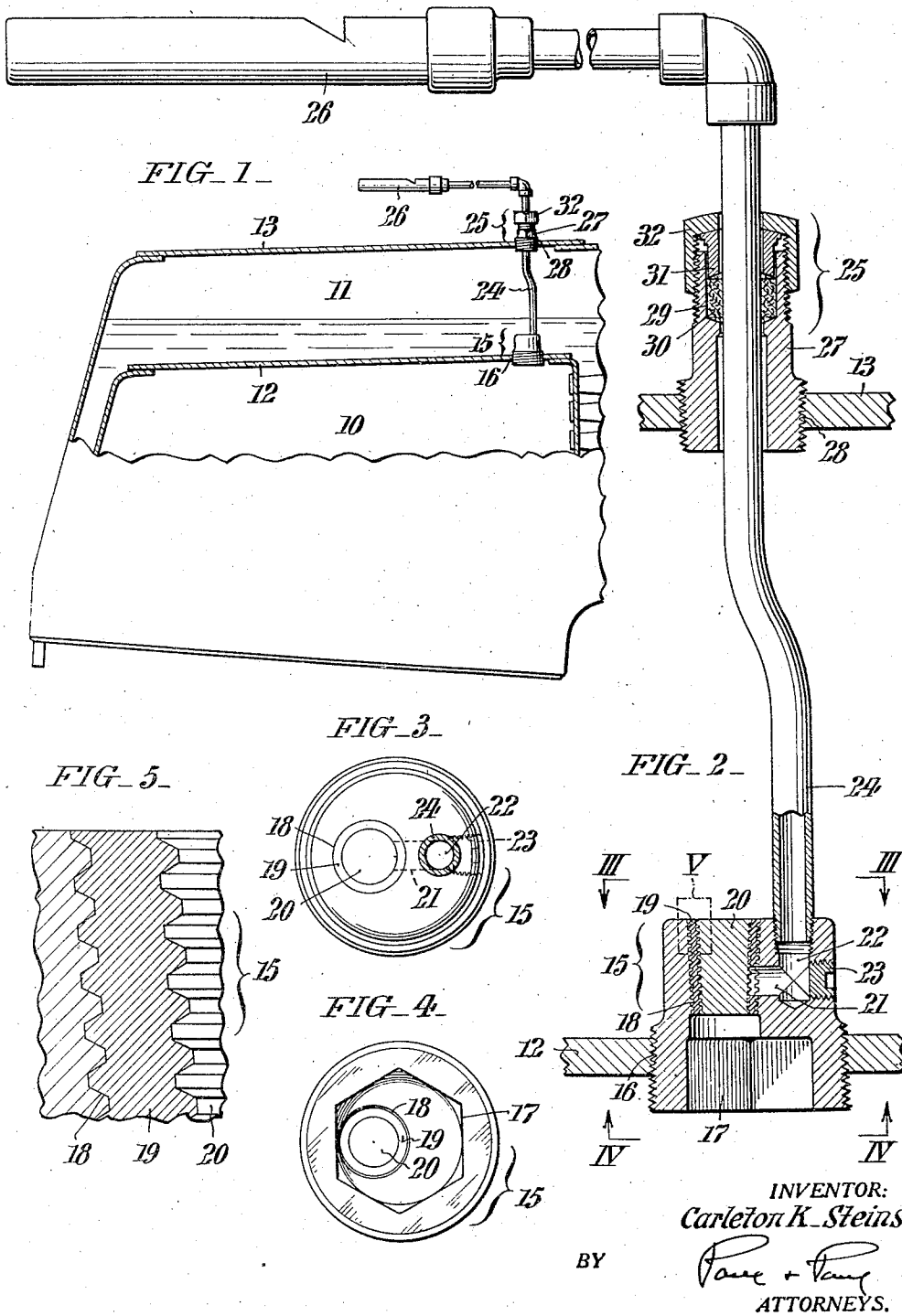
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LOW WATER ALARM FOR BOILERS

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LOW-WATER ALARM FOR BOILERS

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2 Claims. (Cl. 122-504.2)

This invention relates to low water alarms for boilers. More specifically, it has reference to low water alarms intended for use in connection with locomotive boilers, and of a type wherein a socket member engaged in an opening in the crown sheet of the boiler has an aperture stopped with fusible material which, upon melting, when the water drops to a predetermined level, permits escape of steam by way of a tube to an alarm means such, for example, as a whistle at the exterior of the boiler.

Amongst the aims of my invention are to provide a low water alarm of the above character which is positive and reliable in operation; which immediately upon drop of the water to the danger level will release the steam through the tube to operate the audible signal means; and which is so constructed that the socket member can be readily and quickly removed and replaced from within the fire box of the boiler for the purposes of periodic inspection or the renewal of the fusible material when necessary.

Other objects and attendant advantages will appear from the following detailed description of the attached drawing, wherein

Fig. 1 is a fragmentary view, partly in side elevation and partly in longitudinal section, of the rear or fire box section of a typical locomotive boiler equipped with my improved low water alarm.

Fig. 2 is a view corresponding to Fig. 1 on a larger scale and showing the low water alarm in greater detail.

Fig. 3 is a view in horizontal section taken as indicated by the angled arrows III—III in Fig. 2.

Fig. 4 is a view looking as indicated by the angled arrows IV—IV in Fig. 2; and

Fig. 5 is a fragmentary view on still a larger scale showing in greater detail the construction in the region of the dot-and-dash line rectangle V in Fig. 2.

The boiler illustrated in Fig. 1 for the purposes of exemplifying my invention is of conventional design, its fire box being indicated at 10, its water jacket at 11, its crown sheet at 12, and its outer shell at 13.

The low water alarm with which the present invention is more especially concerned includes a socket member 15 which is screwed upwardly into a threaded opening 16 in the crown sheet 12 adjacent the front end of the fire box 10. It will be noted that the socket member 15 has a polygonal recess 17 in its bottom end for application of a wrench in placing and removing it from within the fire box. The socket member 15 is more-

over provided with a downwardly-tapering vertical bore 18 which is normally closed by a stopper means including a lining 19 of suitable soft material or metal which will fuse at a temperature slightly above the temperature corresponding to the steam pressure, and a correspondingly tapered plug 20 of hard metal. Preferably, the lining 19 and the stopper 20 are serratedly interlocked, and the lining similarly interengaged with the surface of the bore as illustrated, after the manner disclosed in U. S. Patent No. 2,301,633, granted to R. N. Miller et al. on November 10, 1942. The bore 18 is eccentrically disposed relative to the axis of the socket member 15, and leading laterally therefrom at a point intermediate its height is a passage 21 which has an upward branch 22, said passage being formed by a drilling operation and thereafter permanently closed by a screw plug 23. The vertical branch 22 of the passage 21 is threaded for connection with a tube 24 which extends upwardly within the water jacket 11 and passes through a stuffing box 25 to the exterior of the boiler for connection thereto of a steam-operable audible signal device 26, here shown as having the form of a whistle. As shown, the body 27 of the stuffing box 25 is threaded into an opening 28 in the boiler shell 13 which is coaxial with the opening 16 in the crown sheet 12 wherein the socket fitting 15 is screwed. Also as shown, the body 27 of the stuffing box is recessed in its top as at 29 for the reception of packing material 30 which is pressed downward by a gland 31 held in place by a screw cap 32.

As a consequence of the described construction, it will be apparent that when the water level in the boiler falls to the level of the top of the socket fitting 15 so that the fusible lining is exposed to the steam, said lining will be melted by the heat of the fire with resultant release of the plug 20, which, under the pressure of the steam in the jacket 11 will be forcibly ejected into the fire box with incidental exposure of the passage 21 and escape of steam by way of the tube 24 to the whistle 26. Due to lateral communication of the passage 21 with the bore 18 of the socket fitting 15, it will be seen that immediately upon the slightest shift of the plug 20, as the fusible material 19 dissolves, steam will escape from the jacket 11 to operate the signal. It is also to be particularly noted that the fused material will all run down into the fire box 10 rather than into the steam jacket or the passage 21 with the result that the possibility of clogging of the latter is obviated.

The manner of removing the socket member 15

for periodic inspection, or for replacement of the fusible lining which may deteriorate under the action of heat and require renewal, is as follows: The whistle 26 is first removed from the tube 24 and the screw cap 32 of the stuffing box 25 backed off for easement of the pressure on the packing 30. With this preparation, the socket member 15 is unscrewed by means of a wrench from within the fire box 10, the tube 24 turning incidentally within the stuffing box 25 until the lower or threaded portion of said socket member is disengaged from the opening 16 in the crown sheet 12. The socket member 15 is thereupon withdrawn together with the tube 24 until it is entirely clear of the crown sheet 12, and finally disconnected from said tube by turning it about the latter. After inspection or replacement of the lining 19 and the plug 20, the parts are assembled in reverse order. Due to the structural simplicity of the device, it will be evident that these steps can be accomplished with comparative ease and with minimum loss of time.

Having thus described my invention, I claim:

1. In a low water alarm for boilers, a closure member removably engageable in an opening in

the fire box wall of a boiler, said member having a longitudinal orifice sealed with material which fuses at a temperature somewhat above that corresponding to the boiler pressure, and a passage leading laterally from said orifice; a conduit means connected to said passage and extending through the water jacket and through the outer shell of the boiler; and a steam-operable signal device connected to said conduit means exteriorly of the boiler.

2. In a low water alarm for boilers, a closure member removably engageable in an opening in the crown sheet of a boiler, said member having a vertical through bore sealed with material which fuses at a temperature somewhat above that corresponding to the boiler pressure, and a passage leading first laterally in said member from the bore and then upwardly adjacent said bore; a communicating tube extending from the vertical portion of said passage through the water jacket and through the outer shell of the boiler; and a steam-operable signal device connected with the outer end of said tube.

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