Feb. 25, 1947. A. C. SCHAUL 2,416,548

BOILER PLUG

Filed June 2, 1944

Fig. 1

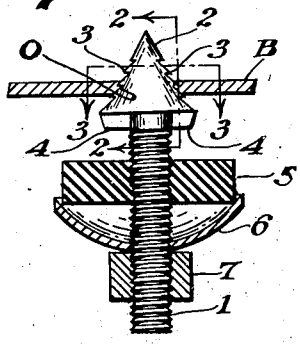
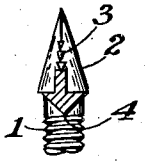



Fig. 2



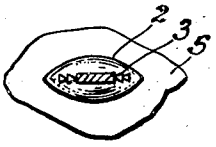
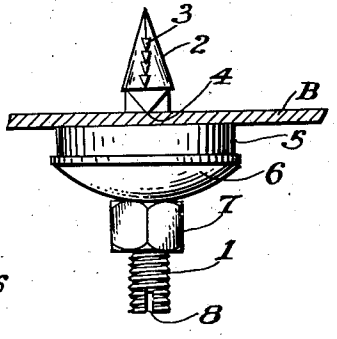




Fig. 3

Fig. 4



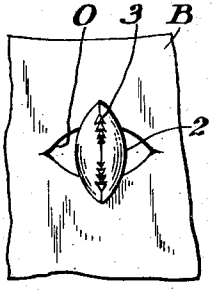




Fig. 5

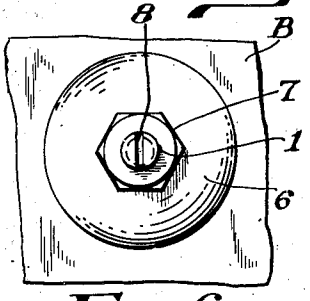



Fig. 6

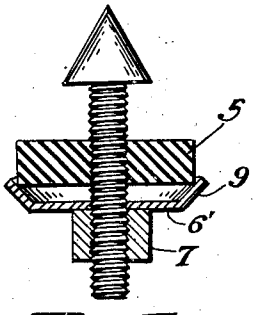



Fig. 7

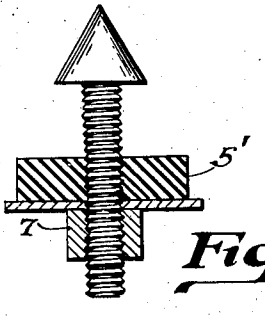



Fig. 9

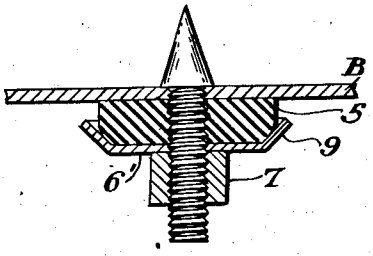



Fig. 8

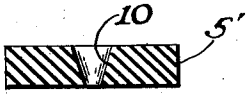



Fig. 10

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## BOILER PLUG

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Application June 2, 1944, Serial No. 538,501

1 Claim. (Cl. 220—25)

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This invention relates, as indicated, to boiler plugs, but has reference more particularly to improvements in the type of boiler plug disclosed in Hughes Patent No. 1,636,135.

A primary object of the invention is to provide a boiler plug of the type referred to having improved means for preventing rotation of the plug after it has been properly located on the boiler wall.

Another object of the invention is to provide a boiler plug of the character described having improved means for facilitating insertion of the plug into the boiler.

A further object of the invention is to provide a boiler plug of the character described, having improved means for causing the rubber washer which is usually associated with such plugs to snugly engage the shank which extends from the arrow head of the plug, whereby to effectively preclude leakage through the washer.

A still further object of the invention is to provide a boiler plug of the character described having a rubber washer of novel construction designed to preclude leakage of water therethrough.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Fig. 1 is a fragmentary cross-sectional view of a boiler plug embodying my invention, and showing the manner in which the plug is inserted into a hole to be plugged;

Fig. 2 is a fragmentary cross-sectional view taken on the line 2—2 of Fig. 1, with the boiler wall omitted;

Fig. 3 is a fragmentary cross-sectional view, taken on the line 3—3 of Fig. 1, with the boiler wall omitted;

Fig. 4 is an elevational view of the parts shown in Fig. 1, but with the spearhead in its normal functioning position;

Fig. 5 is a fragmentary top plan view of the parts shown in Fig. 4;

Fig. 6 is a fragmentary elevational view of the outside of the plug shown in Fig. 4;

Fig. 7 is a view similar to Fig. 1, but showing a modified form of plug;

Fig. 8 is a view similar to Fig. 7, but showing the manner in which the rubber washer is compressed about the spearhead shank, when the plug is in position on the boiler;

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Fig. 9 is a view similar to Fig. 7, but showing still another modified form of plug, and

Fig. 10 is a cross-sectional view of the rubber washer employed with the plug of Fig. 9.

Referring more particularly to Figs. 1 to 6 inclusive of the drawings, the boiler plug will be seen to comprise a threaded shank 1 which terminates at one end in an arrow-head 2 having converging cutting edges terminating in a sharp point. These edges are serrated as at 3, and the rear edge of the arrow-head is tapered to provide chisel edges 4, which extend from the shank 1 of the plug to substantially the rearmost points of the aforesaid converging edges.

The plug further includes a rubber washer 5 having a central opening through which the shank 1 extends, a convex metallic washer 6, also provided with a central opening through which the shank 1 extends, and a nut 7, which is in threaded engagement with the shank 1 at the convex side of the washer 6. The shank 1 is slotted as at 8 for the reception of a screw-driver, it being noted that this slot is substantially in the same plane as a plane common to the cutting edges of the arrow-head.

With the parts in the position indicated in Fig. 1, the point of the arrow head 2 is presented to the opening O in the boiler B, which is to be plugged, and is forcibly driven inward, as indicated in Fig. 1, by means of a hammer applied to the end of the shank 1, until the cutting edges of the arrow head have cut completely through the boiler and the chisel edges 4 have passed completely through the hole. The hole O, at this time, has the approximate outline shown in Fig. 5.

The shank 1 is then turned through an angle of 90°, as shown in Figs. 4 and 5, as by means of a screw driver applied to the slot 8, the position of the slot following this operation affording a visual indication that a 90° turn has been effected.

The shank 1 is then held in the position to which it has been turned, and the nut 7 is then tightened to compress the washers 5 and 6, thereby compressing the rubber washer 5 tightly against the outside of the boiler B, as shown in Fig. 4. At the same time, the chisel edges 4 are drawn tightly against the inner wall of the boiler B adjacent the hole O, these edges biting into the metal of the boiler or the incrustations on such wall with such force as to completely preclude any possibility of the plug being turned from its position, once it has been properly applied to the boiler.

Since these chisel edges extend from some distance on both sides of the shank 1, they provide extended contact edges with the boiler and an efficient bearing for the arrow head on the boiler wall. These extended edges are effective even in cases where the interior boiler wall is pitted to such an extent as to make pointed barbs, as shown in the aforesaid Hughes patent, somewhat unsatisfactory, due to the mere point contact of such barbs with the boiler wall. These extended chisel edges, moreover, are advantageous in that they are less likely to be chipped or damaged from handling than are pointed barbs, and are also less likely to be broken when pressure is appiled between such edges and the boiler wall.

The serrations 3 in the cutting edges of the arrow head have been found to be advantageous in that they tend to facilitate the driving of the arrow head into the boiler wall, that is to say, they render somewhat easier the driving of the arrow head into the boiler wall, particularly where the hole in the boiler wall is relatively small and requires considerable enlargement.

Referring to the plug shown in Figs. 7 and 8, the metallic washer 6' in this case has a tapered flange 9, the outer edge of which is somewhat larger in diameter than the diameter of the washer 5, the flange being of considerable length, approaching that of the washer 5 itself.

When pressure is applied by the nut 7 against the washer 6', the flange 9 exerts a wedge-like pressure against the periphery of the washer 5, and thereby causes the washer 5 to snugly engage the shank of the arrow head, as indicated in Fig. 8, with the result that leakage between the rubber washer and the shank is effectively precluded.

Referring to the plug shown in Figs. 9 and 10, the rubber washer 5' in this case has a central hole 10, which is tapered in the direction of its length, the larger end of the hole, as shown in Fig. 10, being of approximately the same diameter as the shank of the arrow head, but the smaller end of the hole being of considerably smaller diameter than said shank.

When the washer is forced over the shank, as



in Fig. 9, the rubber adjacent the smaller end of the tapered hole 10 will be forced radially outwardly, with the result that the washer will snugly engage the shank at this point, and leakage between the washer and shank will be effectively prevented.

It is to be understood that the forms of my invention, herewith shown and described, are to be taken as preferred examples of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of my invention, or the scope of the subjoined claim.

Having thus described my invention, I claim:

A boiler plug comprising a threaded shank having an arrow shaped head at one end of the shank, said head having on the base thereof radially extending chisel edges of substantial length extending from the shank to the edges of said head and lying in a plane substantially normal to the axis of the shank, said chisel edges comprising downwardly converging faces terminating in sharp cutting edges located intermediate the side faces of the arrow head, and a nut cooperating with the threaded shank and adapted to draw the chisel edges against the interior face of a boiler to prevent rotation of the head when the nut is turned in either direction on the shank.

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