July 21, 1942. W. D. DUTTON 2,290,368

BOILER CLEANING DEVICE

Filed June 11, 1940

Fig. 1.

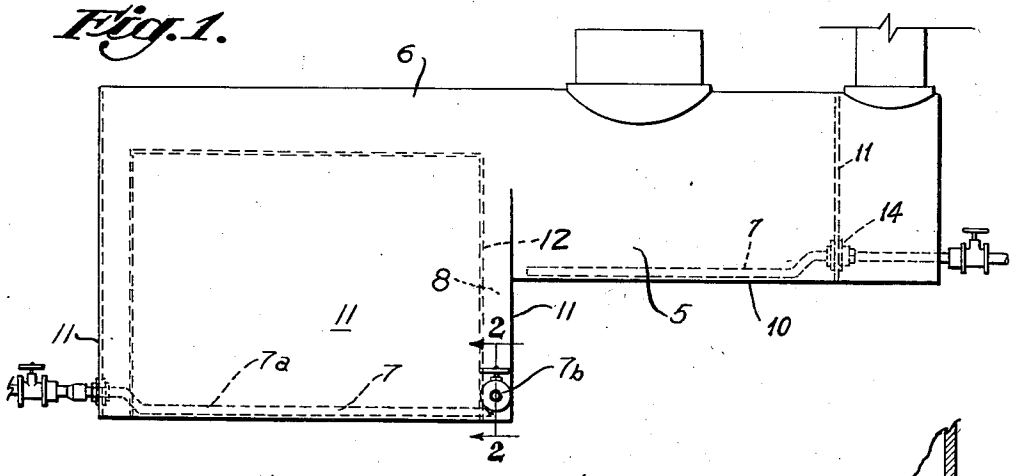


Fig. 2.

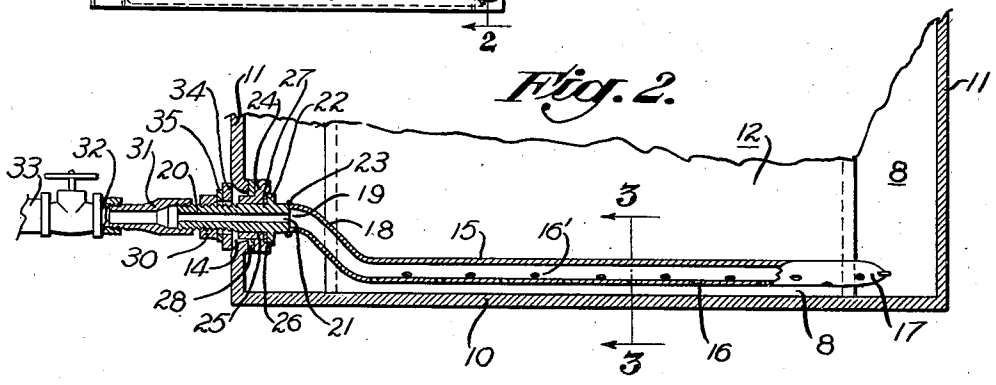
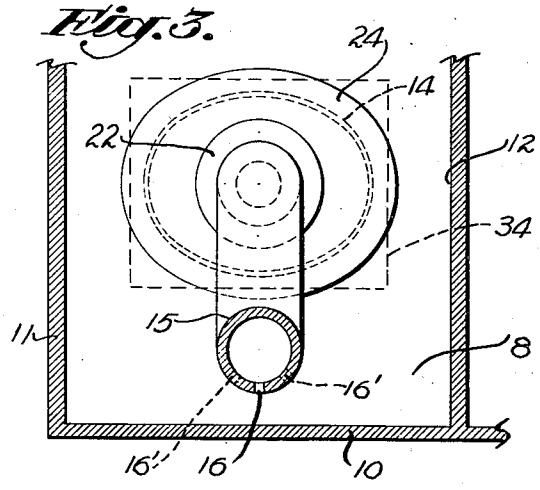


Fig. 3.



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BOILER CLEANING DEVICE

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4 Claims. (Cl. 122—405)

My invention relates to a simple cleanout device for mud from the mud sills and barrel of boilers, and relates in particular to a simple device which may be readily installed in old boilers as well as new, and which employs the boiler pressure in performance of the cleanout operation.

It is an object of the present invention to provide a device which may be installed in place in the spaces of a boiler wherein mud accumulates, without necessity of making any structural change in the boiler, it being a feature of the present invention to provide a device which is installed through and secured in the normal hand holes provided in external boiler walls for access to the internal spaces of the boiler.

It is an object of the invention to provide a boiler cleanout device having a perforate pipe which may be passed into the space of the boiler which is to be kept clean, through normal hand holes, and having means cooperating with the hand hole wall to hold the cleanout device securely in operative position and to close the hand hole against escape of fluid therethrough.

A further object of the invention is to provide a device of this character wherein simple means are provided for supporting the draw-off nozzle or pipe and for controlling the discharge flow of mud through the openings of the draw-off pipe thereby avoiding the possibility of a rapid cutting away of metal surrounding the openings in the draw-off pipe, resulting from the movement of sediment through these openings at excessive velocity.

Further objects and advantages of the invention will be brought out in the following part of the specification.

Referring to the drawing which is for illustrative purposes only:

Fig. 1 is a schematic elevational view of a boiler, to show the manner in which my invention is used therewith.

Fig. 2 is an enlarged fragmentary section taken on a plane represented on a line 2—2 of Fig. 1.

Fig. 3 is a further enlarged fragmentary section taken as indicated by the line 3—3 of Fig. 2.

Although the invention may be used with boilers of various types it is especially adapted for use with that type of boiler having a hollow external wall structure around either the fire box or the barrel, or both, this hollow wall structure providing a chamber forming a part of or connected with the water or steam chambers of the boiler. In Fig. 1 I show a boiler of this general type having a cylindrical barrel section 5 and a fire box section 6 disposed at one end of the tube section 5. To illustrate the general application of the invention I have shown how mud devices 7, specifically indicated as 7a and 7b, may be readily installed in the mud sills 8 of the hollow wall structure which forms or encloses the fire box 6 of the boiler. As shown in Figs. 2 and 3, the fire box 6 has a bottom wall 10 from the periphery of which outer walls 11 extend upward. Within these outer walls 11, and spaced therefrom a distance 4 to 6 inches, there are inner walls 12 which cooperate with the outer walls 11 to form water spaces 13 ordinarily referred to as mud sills in view of the tendency for sediment from the boiler water to accumulate therein.

As best shown in Fig. 2 the outer walls 11 have hand holes 14 aligned with the ends of the mud sills 8 to provide access thereto for purpose of cleaning out sediment. In my present invention the cleanout devices 7 are so formed that they may be permanently installed in positions to project through the respective hand holes 14, and it is a feature of the invention to provide simple means whereby the cleanout devices 7 may be readily assembled and installed in the spaces of boilers, such as the mud sills 8 and barrel, by the use of members which are employed in substitution for the customary hand hole cover and clamping yoke. By use of the simple arrangement of parts shown, I am able to quickly install the cleanout devices in old boilers.

As best shown in Fig. 2 wherein the invention is shown as used in the mud sill, the device includes a pipe 15 of such length that it will pass substantially from end to end of the mud sill 8 or barrel 5 in which it is installed, this pipe having spaced openings 16 in the lower walls thereof, some of these openings 16 lying in the vertical plane which intersects the axis of the pipe, as shown in Fig. 3, while other of the openings are directed diagonally downwardly and outwardly as shown at 16'. The front end 17 of the pipe 15 is closed, and the other end 18 thereof is bent upward so that the mouth 19 of the pipe 15 will lie on the axis of the hand hole 14 when the perforated portion of the pipe lies in a position close to the bottom wall 10.

To support the cleaning device 7 in the opening 14, I provide a tubular member 20, the external diameter of which is substantially the same as the external diameter of the pipe 15, but which has a heavy wall with the result that the opening through the tubular member 20 constitutes a flow controlling orifice, or "flow beam" 21, computed

so as to maintain the flow through the openings 16 and 16' at a velocity which will not result in a rapid cutting out of the openings 16 and 16'. A flange 22 is formed near the inner end of the tubular member 20, and this tubular member 20 is connected to the pipe 15 by simple means such as a weld 23. To cooperate with the flange 22 I provide a removable flange or bushing 24 of oval shape so that it will pass through the hand hole 14 which has a similar oval shape, as shown by dotted lines 14 in Fig. 3. This flange member 24 is of the general shape of the standard hand hole cover provided for the hand hole 14, and being so formed it may be passed through the hand hole 14 into the mud sill 8. The flange 14 has an opening 25 therethrough to receive the tubular member 20, and in the inner face thereof has a recess 26 to receive a gasket 27 and a portion of the flange 22, thereby providing a seal between the flange member 24 and the tubular member 20. A gasket 28 is disposed between the flange member 24 and the wall which defines the hand hole 14. The outer, or leftward, portion of the tubular member 20 is threaded so as to receive a clamping nut 30 and a reducing fitting 31 by which a control valve 32 and piping 33 may be connected to the tubular member 20. A clamping plate 34, which may be rectangular in shape, is disposed between the clamping nut 30 and the outer face of the outer fire box wall 11, and preferably a lock washer 35 is disposed between the clamping plate 34 and the clamping nut 30.

The installation of the cleanout device 7 is as follows. When the parts 24, 28, 34, 35, and 31 are removed from the tubular member 20, the pipe 15 and the member 20 are passed through the hand hole 14 into the therewith aligned mud sill 8. The tubular member 20 is passed entirely through the hand hole 14 so that the outer, or leftward, end thereof will lie inside the opening 14. Then the flange member 24 is passed through the opening and is placed over the tubular member 20 so that this will slide thereon into cooperation with the flange 22. With the gasket 28 properly positioned, the leftward end of the tubular member 20 is then moved out through the hand hole 14, the plate 34, the washer 35, and the clamping nut then being applied to draw the flange 24 forcibly toward the wall of the hand hole 14, thereby clamping the gasket 28 so as to form an effective seal for the hand hole 14. The tubular member 20 will now be clamped in a rigid position to hold the pipe 15 in spaced relation to the bottom wall 10. By means of the fitting 31 the valve 32 and the piping 33 may be attached to the tubular member. The valve 32 may be periodically opened while the boiler is under pressure, so that mud will be forced out through the openings 16 and 16' by the boiler pressure, but at a velocity controlled by the flow bean or orifice 21.

I claim as my invention:

1. A boiler cleanout device adapted to be placed in position from the outside of a boiler and supported by engagement of clamping means with the peripheral edge of a hand hole of usual form having a dimension greater in one direction than the other and to project through said hand hole, said device comprising the combination of: a tube adapted to be passed through a hand hole, said tube having a perforate inner portion, and an outer portion offset from said inner portion to extend through said hand hole, said outer portion having a flange projecting therefrom and a transverse portion connecting said inner and outer portions; a flange member having an opening to receive said outer portion of said tube, said flange member having a peripheral wall shaped to overlie the inner peripheral edge of said hand hole, said flange member being of a size to be passed through said hand hole and assembled on said outer portion of said tube, after which a part of said outer portion of said tube may be moved out through said hand hole; a clamping plate having an opening therein so that it may be placed on the projecting part of said outer portion of said tube to engage the outer peripheral edge of said hand hole; means making threaded engagement with said projecting part of said outer portion of said tube to force said clamping plate against the outer peripheral edge of the hand hole and clamp said flange member against the inner face of said boiler wall; and means for sealing between said flange of said tube and said flange member, and to seal between said flange member and the peripheral edge of the hand hole.

2. In a boiler cleanout attachment adapted to be supported in a position extending through an oval hand hole of a boiler, the combination of: a tube adapted to be passed through a hand hole formed in a boiler wall, said tube being bent so that the inner portion thereof will be offset from the outer portion thereof having openings spaced along the inner portion thereof; flange means on the portion of said tube which passes through said hand hole, to close said hand hole; and means for clamping said flange means against the peripheral edges of the hand hole, there being a valve connected to the projecting end of said tube whereby the flow through said tube may be turned on and off.

3. In a boiler cleanout device adapted to be supported in a position extending through an oval hand hole of a boiler, the combination of: a tube adapted to be passed through a hand hole, said tube having a perforate inner portion, and an outer portion to extend through said hand hole, said outer portion having a flange projecting therefrom; a flange member having an opening to rotatably receive said outer portion of said tube, said flange member having an oval peripheral wall to overlie the inner peripheral edge of said hand hole, said flange member being of a size to be passed through said hand hole, and said tube having an offset between the inner and outer portions thereof so that when said outer portion extends through said hand hole, said inner portion will lie close to the bottom wall of said internal space of said boiler; a clamping member having an opening therein so that it may be placed on the projecting part of said outer portion of said tube to engage the outer face of said boiler wall; means making threaded engagement with said projecting part of said outer portion of said tube to force said clamping member toward said boiler wall and clamp said flange member against the inner face of said boiler wall; and means for sealing between said flange of said tube and said flange member, and to seal between said flange member and said boiler wall.

4. A boiler cleanout device adapted to be placed in position from the outside of a boiler and supported by engagement of clamping means with the peripheral edge of a hand hole of usual form having a dimension greater in one direction than the other and to project through said hand hole, said device comprising the combination of: a tube formed so that the inner portion thereof will be offset from the outer portion thereof and

having openings spaced along the inner portion, a flange projecting from said outer portion; a one-piece flange member having a wall of a shape to overlie the peripheral edges of said hand hole on the inner side thereof but permitting it to pass through said hand hole to be placed in position; a clamping member having an opening therein so that it may be placed on the outer portion of said tube to engage the outer peripheral edge of said hand hole; means making threaded engagement with said outer portion of said tube to force said clamping member toward the outer peripheral edges of said hand hole and to clamp said flange member against the inner edges of said hand hole; and means for sealing between the flange of said tube and said flange member, and to seal between said flange member and the peripheral edges of said hand hole.

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