

Sept. 8, 1936.

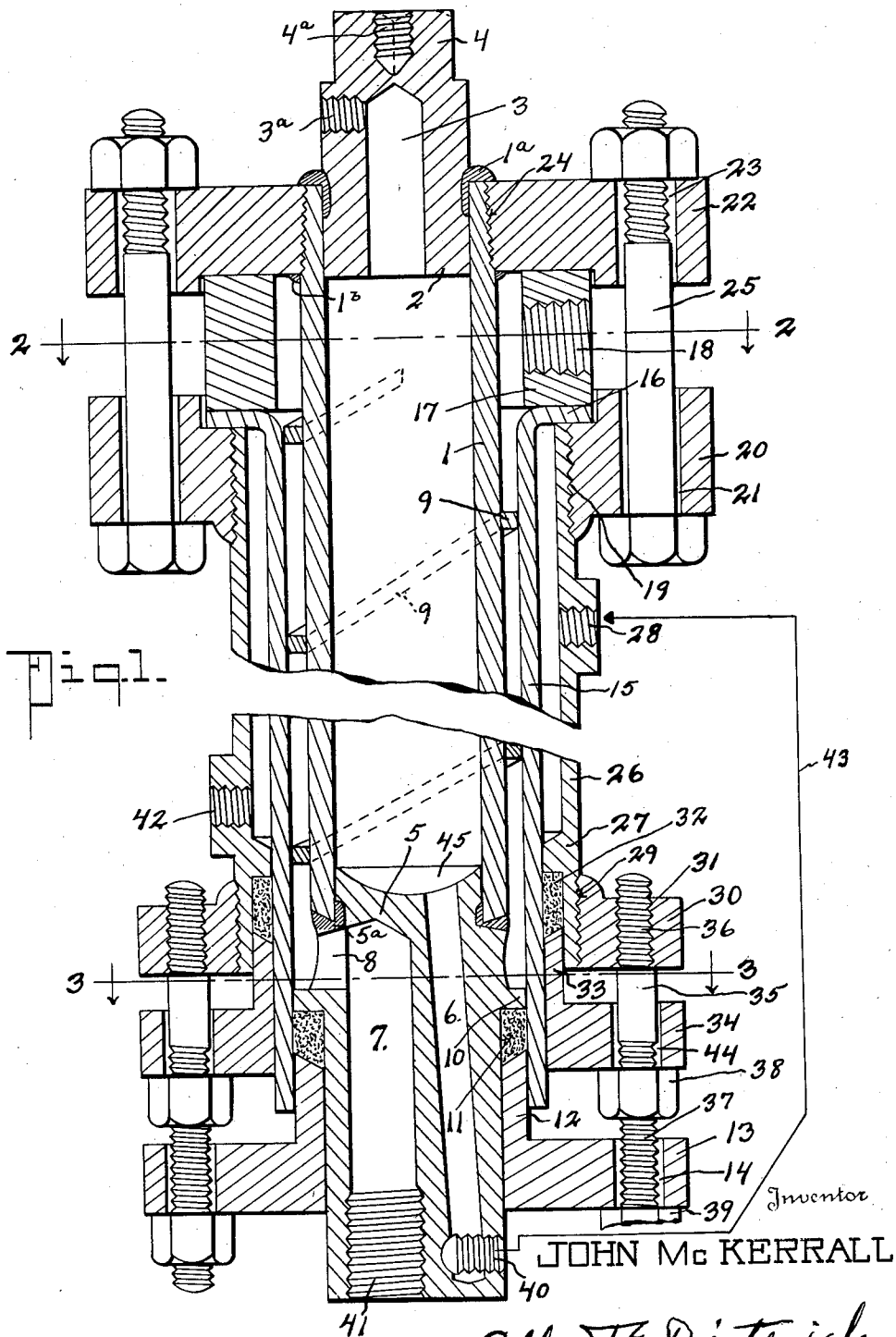
J. McKERRALL

2,053,623

OIL HEATER

Filed March 5, 1936

2 Sheets-Sheet 1



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Fig. 2.

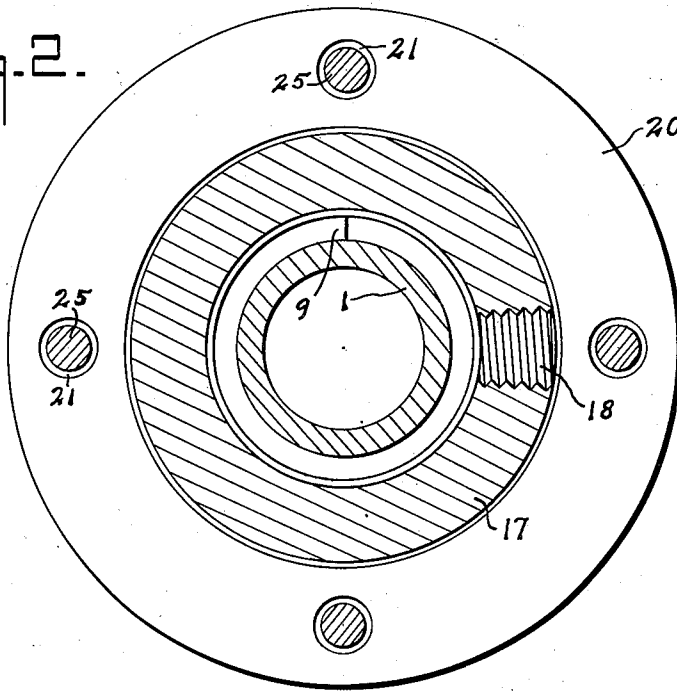
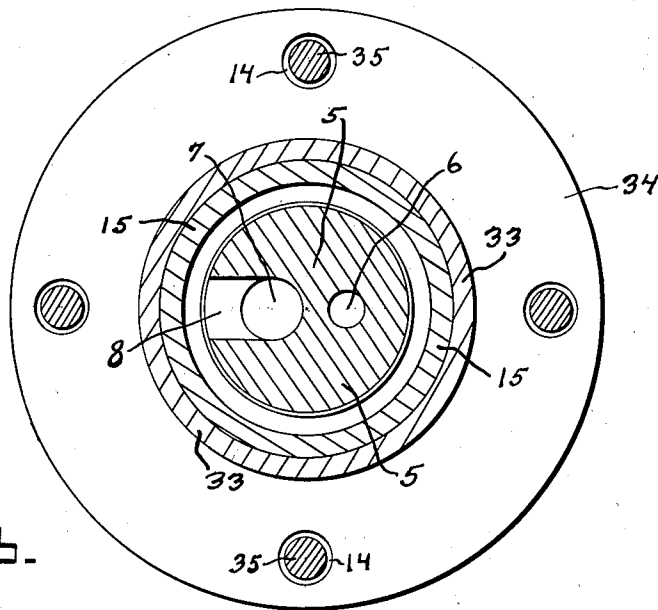


Fig. 3.



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UNITED STATES PATENT OFFICE

2,053,623

OIL HEATER

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Application March 5, 1936, Serial No. 67,408

4 Claims. (Cl. 257—246)

My invention relates to certain new and useful improvements in heating fuel oil by means of steam and it particularly has for its object to provide a fuel oil heater of a simple construction, whose parts are so designed and cooperatively arranged that the heater may readily be taken apart for cleaning and repairs.

Further, it is an object to provide a fuel oil heater of such character that, without disassembling its parts, carbon deposits or scale may be loosened from the outer casing or wall and be blown out or flushed out easily.

More specifically the present invention has for its object to improve the construction of the heater disclosed in my application Serial No. 38,138, filed August 27, 1935, and to so construct the apparatus that it will meet with the approval of the United States Steam Boat Inspection Service.

Other objects will in part be obvious and in part be pointed out hereinafter.

To the attainment of the aforesaid objects and ends, the invention still further resides in those novel details of construction, combination and arrangement of parts, all of which will be first fully described in the following detailed description, then be pointed out in the appended claims, reference being had to the accompanying drawings, in which:—

Figure 1 is a vertical longitudinal section of a heater embodying the invention, parts being broken away.

Figure 2 is a transverse section on the line 2—2 of Figure 1.

Figure 3 is a transverse section on the line 3—3 of Figure 1.

In the drawings, in which like numerals of reference indicate like parts in all of the figures, 1 represents the central casing of the pipe which is closed at the top by a plug 2 that is welded or otherwise permanently fastened to the pipe 1 as at 1a. The plug 2 is provided with a steam entrance duct 3, a portion 3a of which is threaded to receive a steam pipe connection (not shown). The extreme upper end of the plug 2 is provided with a squared nut portion 4 bored and tapped at 4a to receive an eye bolt (not shown) for lifting the inner steam jacket or casing 1 when it is desired to separate the parts for cleaning or other purposes.

At the bottom the casing 1 is also closed permanently by a plug 5 that is welded or otherwise integrally secured at 5a to the casing 1 and is provided with a steam outlet and drain duct 6, the lower end of which is threaded at 40 to connect by a suitable pipe connection (not shown but indicated by arrow 43) to the inlet 28 of the outer casing or jacket 26. The plug 5 is also provided with an oil inlet passage 7 communicating through a port 8 with the inside of the casing 1.

The duct 7 may have its outer end threaded as at 41 to connect with the oil supply pipe (not shown).

On the outer wall of the casing 1 is located a spiral rib 9 that may be welded or otherwise permanently secured to the casing 1, the rib fitting within the intermediate or middle casing 15 to provide an oil passage between the casings 1 and 15 that is spiral in character.

The plug 5 is provided with a shoulder 10 against which the barrel 12 of the gland flange 13 forces the packing 11 to provide a fluid-tight joint between the plug 5 and the intermediate casing 15. The gland flange 13 is bored at 14 to receive the gland studs 35. These studs 35 are threaded at 36 into the flange 30 that is screwed at 29 to the lower end of the outer casing 26. The intermediate or middle casing 15 has its upper end bent outwardly to form a flange 16 which engages the upper end of the outer casing 26 and also engages the recessed portion of the pipe flange 20 that is screwed at 19 onto the upper end of the outer casing 26 and is provided with holes 21 through which the bolts 25 pass.

17 designates a distance piece forming an outlet for oil, the distance piece having a tapped opening 18 to which the oil outlet pipe (not shown) is connected. 22 designates a top flange which is screwed at 24 to the upper end of the central casing 1 and preferably welded thereto as at 1b. The bolts 25 pass through the openings 23 in the top flange 22 and carry nuts, the flanges 20 and 22 may be drawn toward one another to effect a fluid-tight joint between the parts 20, 16, 17 and 22.

Near the lower end the outer casing 26 is provided with an inwardly projected flange 27 to cooperate with the packing 32 that is compressed by the barrel 33 of the packing gland 34, the latter having openings 44 for the passage of the gland studs 35 hereinbefore referred to. The flange 30 is bored and tapped at 31 to receive the threaded ends 36 of the gland studs 35, the gland studs having their other ends threaded as at 37 to receive the nuts 38 and 39, respectively.

42 designates the drain outlet from the outer jacket. The steam from outlet 42 is, in practice, conveyed to a steam trap (not shown).

By the construction illustrated and described it will be observed that the casings 1, 15 and 26 are rigidly secured together only at the top through the medium of the flange 16, distance piece 17 and the pipe flanges 20 and 22. The casings 1, 15 and 26 are connected at the bottom only through the packed glands so as to allow for expansion and contraction. In the present construction, it will be observed that neither of the casings 1, 15 or 26 are permanently secured to each other and all three may be readily separated

for cleaning purposes. By removing the studs 25 the casings 1 and 15 may be withdrawn from the casing 26, or the casing 1 may be simply lifted out without disturbing the casing 15. For cleaning purposes, it is usually sufficient to remove the casing 1 by putting the eye bolt in the opening 4a and lifting the casing by any suitable means attached to the eye bolt.

From the foregoing, it will be seen that when steam is admitted into the inner casing 1 through passage 3 it passes down through the inner casing and duct 6 of plug 5 to outlet 40 and from thence to inlet 28 of the outer casing filling the space between the outer and intermediate casings and finally leaving via outlet 42. The oil entering the middle casing via duct 7 of plug 5 passes upwardly through the spiral passage and out through the outlet 18. During its passage the oil is heated because of the presence of steam in the inner and outer casings. Should carbon begin to clog up the flow of oil it is only necessary to loosen the nuts and remove the bolts 25 and rotate the casing 1 to scrape off the carbon deposit that may form on the wall of the intermediate or central casing 15. It may then be flushed out by the flowing stream of oil or steam may be forced through the oil duct by connecting a steam line to the oil inlet or outlet passages, if desired, in order to thoroughly clean the oil duct.

In order to effectively drain any water of condensation from the inner casing 1, the upper end of the plug 5 is concaved at 45 so that the collected fluid will pass down through the passage 6 in draining.

From the foregoing description, taken in connection with the accompanying drawings, it is thought the complete construction, operation and advantage of the invention will be readily understood by those skilled in the art.

What I claim is:

1. In an oil heater, three nested tubes, members closing the ends of the central tube and having provisions to pass steam into and deliver steam from the interior of said central tube, a top flange secured to the outer tube, a top flange secured to the inner tube, the middle tube having a flange to overlie the top of the outer tube, a distance piece between said middle tube's flange and the top flange of said inner tube, means securing said flanges and distance piece together in fluid-tight engagement, said distance piece being spaced away from said inner tube and having an oil outlet, expansion packing devices at the lower ends of said tubes to seal the central and middle tubes together and to seal the middle and outer tubes together, said tubes being spaced apart to provide a space between the inner and central tubes and a space between the central and outer tubes to constitute fluid passages, means to admit oil to the space between the inner and middle tubes, and means to admit and deliver steam to and from the space between the middle and outer tubes.

2. In an oil heater, three nested tubes, members closing the ends of the central tube and having provisions to pass steam into and deliver steam from the interior of said central tube, a top flange secured to the outer tube, a top flange secured to the inner tube, the middle tube having a flange to overlie the top of the outer tube, a distance piece between said middle tube's flange and the top flange of said inner tube, means se-

curing said flanges and distance piece together in fluid-tight engagement, said distance piece being spaced from said inner tube and having an oil outlet, said tubes being spaced from one another, a bottom flange secured to the outer tube, gland studs carried by said bottom flange, a flanged packing gland for sealing the central and middle tubes together at the bottom as an expansion packed joint, a second flanged packing gland for sealing the middle and outer tubes together at the bottom as an expansion packed joint, the flanges of said glands having holes for receiving said studs, nuts threaded on said studs for drawing up on said glands, means to admit steam to the space between the middle and outer tubes and to deliver steam therefrom, and means to admit oil to the space between the inner and middle tubes and deliver oil therefrom.

3. In an oil heater, three nested tubes, members closing the ends of the central tube and having provisions to pass steam into and deliver steam from the interior of said central tube, a top flange secured to the outer tube, a top flange secured to the inner tube, the middle tube having a flange to overlie the top of the outer tube, a distance piece between said middle tube's flange and the top flange of said inner tube, means securing said flanges and distance piece together in fluid-tight engagement, said distance piece being spaced away from said inner tube and having an oil outlet, expansion packing devices at the lower ends of said tubes to seal the central and middle tubes together and to seal the middle and outer tubes together, said tubes being spaced apart to provide a space between the inner and central tubes and a space between the central and outer tubes to constitute fluid passages, means to admit oil to the space between the inner and middle tubes, means to admit and deliver steam to and from the space between the middle and outer tubes, and a spiral rib on the outer wall of the inner tube for the purposes described.

4. In an oil heater, three nested tubes, members closing the ends of the central tube and having provisions to pass steam into and deliver steam from the interior of said central tube, a top flange secured to the outer tube, a top flange secured to the inner tube, the middle tube having a flange to overlie the top of the outer tube, a distance piece between said middle tube's flange and the top flange of said inner tube, means securing said flanges and distance piece together in fluid-tight engagement, said distance piece being spaced from said inner tube and having an oil outlet, said tubes being spaced from one another, a bottom flange secured to the outer tube, gland studs carried by said bottom flange, a flanged packing gland for sealing the central and middle tubes together at the bottom as an expansion packed joint, a second flanged packing gland for sealing the middle and outer tubes together at the bottom as an expansion packed joint, the flanges of said glands having holes for receiving said studs, nuts threaded on said studs for drawing up on said glands, means to admit steam to the space between the middle and outer tubes and to deliver steam therefrom, means to admit oil to the space between the inner and middle tubes and deliver oil therefrom, and a spiral rib on the outer wall of the inner tube for the purposes described.

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