No. 867,073. PATENTED SEPT. 24, 1907.

G. PATTERSON.

CLEANER FOR WATER TUBE BOILERS.

APPLICATION FILED MAR. 20, 1907.

Fig. 1.

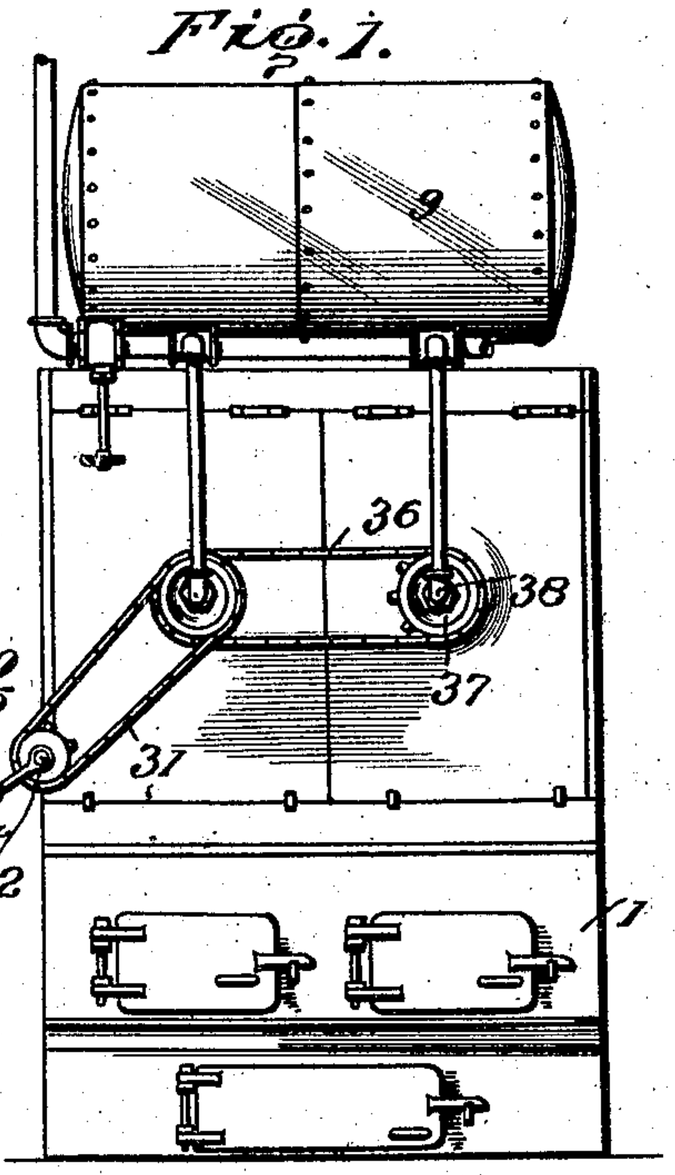


Fig. 2.

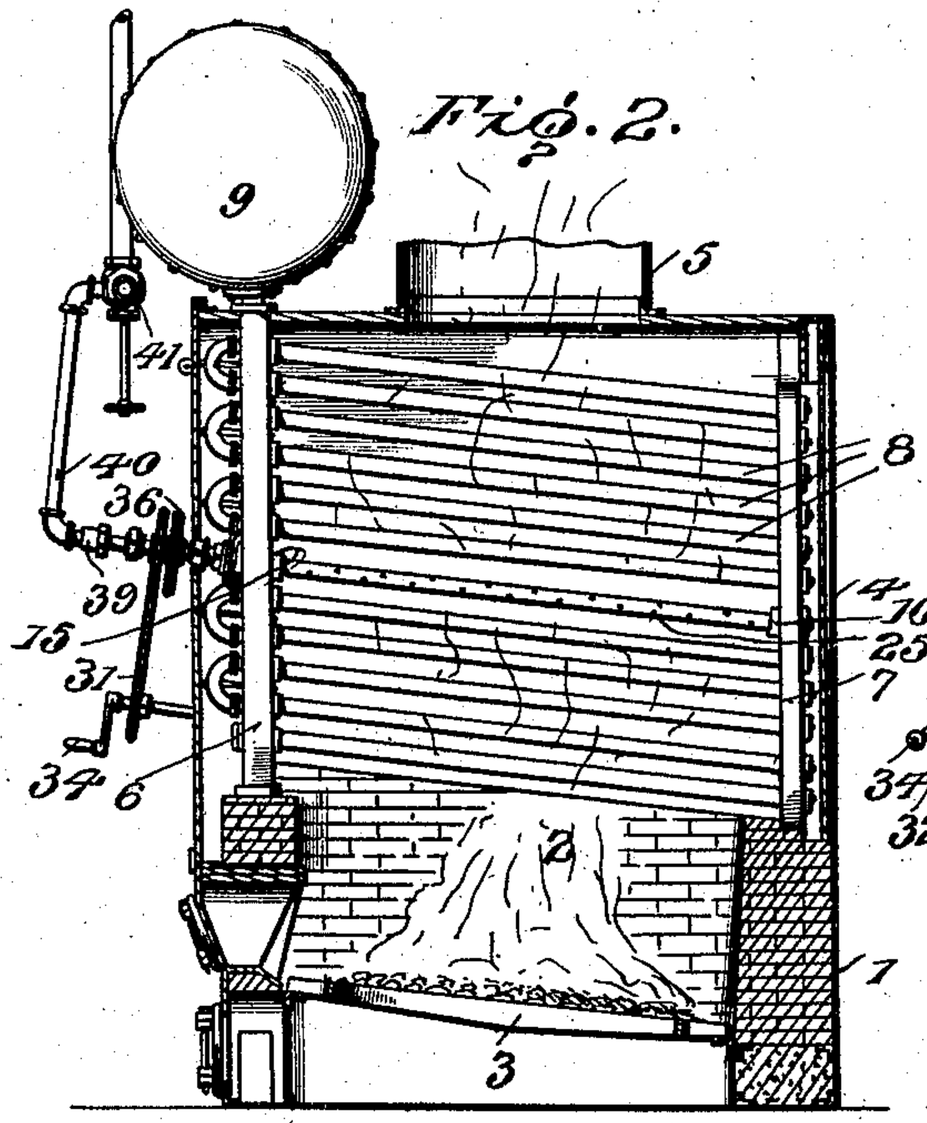


Fig. 3.

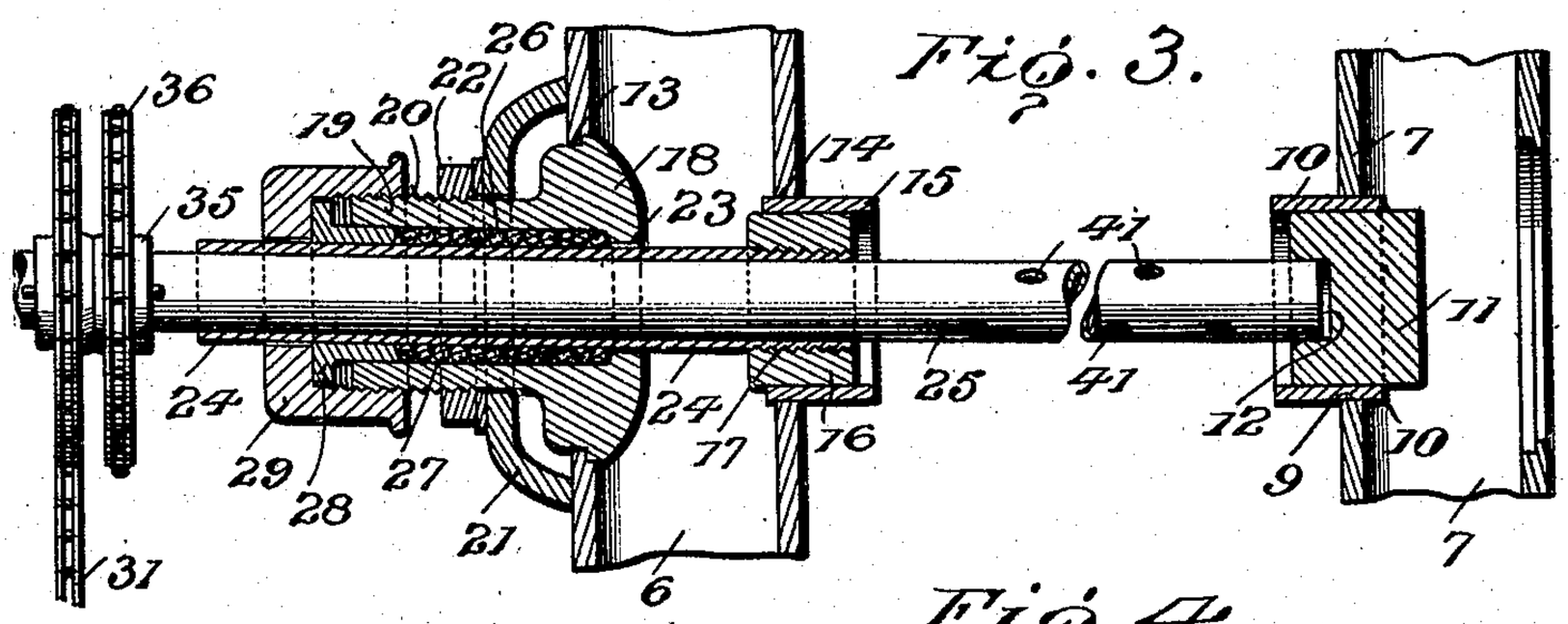
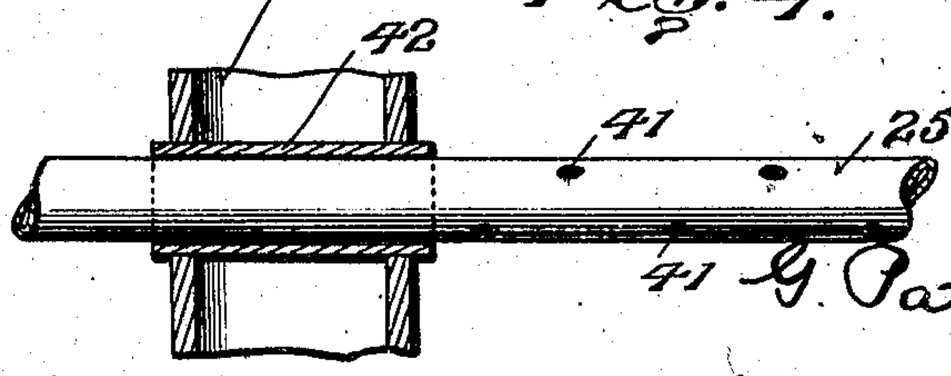


Fig. 4.



Witnesses

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CLEANER FOR WATER-TUBE BOILERS.

No. 867,073. Specification of Letters Patent. Patented Sept. 24, 1907.

Application filed March 20, 1907. Serial No. 363,399.

To all whom it may concern:

Be it known that I, GILBERT PATTERSON, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Cleaners for Water-Tube Boilers, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in cleaners for water tube boilers.

The object of my invention is to provide a cleaner of the character described, which can be readily applied to any of the well known water tube boilers, without altering or changing the same, and which is adapted to more thoroughly clean the soot and scale from the outer face of the tubes.

Another object of my invention is to provide a simple, cheap and effective device of this character.

In the accompanying drawings, Figure 1, is a front elevation of a water tube boiler showing the application of my improved cleaner. Fig. 2, is a vertical sectional view through the boiler showing the position of the spraying tube. Fig. 3, is an enlarged sectional view of the cleaner showing its connection with the front and rear heads of the boiler. Fig. 4, is a modified form of the means for attaching the device to the head.

Referring now to the drawings, 1 represents a suitable foundation having the fire box 2 provided with the grate 3, and carried by said foundation is the usual metal casing 4 having the smoke stack 5 communicating with the upper end, all of which can be readily modified, but this form is simply shown to show the application of my cleaner.

Carried by the foundation 1 are the front and rear heads 6 and 7, and which, as shown, are connected by a series or nest of inclined tubes 8 which communicate with the heads 6 and 7, and through which the water circulates from one head to another. The front head 6 communicates with the dome 9, and said dome being above the casing, as shown in Figs. 1 and 2. The smoke and gases, as will be seen, pass upward from the fire box around the tubes 8 and deposit soot and scale upon the tubes, and render them impervious to the heat, and it is the purpose of my invention to remove this soot and scale thoroughly from all of the tubes.

In order to apply my cleaner, to a boiler of the kind shown, the tubes being very close together it is necessary to remove one tube, as shown. In some boilers, this is not necessary, as the tubes are located a sufficient distance apart to allow the cleaner to pass between the same, as will be hereinafter more fully described. By removing one of the tubes of the boiler, as heretofore described, the heads 6 and 7 are left with openings, and it is the object of my invention to provide means for rotatably mounting my cleaner within these openings, and at the same time forming a tight joint with the heads to prevent the water from leaking from the heads and yet making the cleaner removable when desired. The rear head 7, as shown, has the opening 9 from which the tube is removed, and placed within this opening is a short piece of tubing 10, and driven into this tube is a tapering plug which expands the tube and causes the same to form a tight joint with the inner wall of the rear head around the opening. The said plug 11 is of a solid form, and has a recess 12 in its inner face, as will be hereinafter more fully described. The front head 6 has the two oppositely arranged openings 13 and 14 in its front and rear walls from which the water tube has been removed. Placed within the opening 14 in the rear wall of the head is a short tube 15 in which a tapering plug 16 is driven from the front into the tube 15, the said plug having a screw-threaded opening 17 therein. Within the opening 13 is an enlarged plug 18 which extends outwardly at 19, and is screw-threaded at 20. Resting against the front wall of the front head is a bridge 21 through which the outwardly-extending portion 20 of the plug 18 extends. Carried by the screw-threaded portion 20 is a nut 22 which bears against the bridge and draws the plug 18 outwardly, causing the same to form a tight joint with the outer wall of the head. The plug 18 is provided with an opening 23 through which the tube 24 passes, and the inner end of the tube being screw-threaded and screwed into the screw-threaded opening 17 in the plug 16. Passing through the said tube 24 is a pipe 25 which has a closed outer end resting within the recess 12 in the plug 11, whereby the same is rotatably mounted. The plug 18 has an annular recess 26 surrounding the opening therein in which is placed a packing 27 to form a tight joint with the tube 24. Extending within said recess from its outer end is a follower 28 which is engaged and forced inwardly by the cap 29 whereby the packing is compressed to the desired degree to prevent leakage around the tube 24. The said cap has an inwardly-extending flange internally screw-threaded screwed upon the threaded portion 20 for forcing the follower inwardly, as heretofore described. The pipe 25 extends out beyond the tube 24 and carries a sprocket wheel 30 over which a chain 31 passes, and by means of which the pipe 25 is rotated, as will be hereinafter more fully described. The said chain passing over a sprocket wheel 32 carried by the side of the boiler and driven by a crank 34. In most instances the boilers are of such a size that more than one pipe is necessary to thoroughly clean all the tubes, and if such is the case, the tube 25 is provided with a second sprocket wheel 35 over which a chain 36 passes, and said chain passing over the sprocket wheel 37 carried

by the second pipe 38, whereby the two chains are simultaneously rotated by the crank 34. The outer end of the tube 25 is connected to a flexible stuffing box 39 to which is connected a pipe 40 which extends upwardly and is connected to the dome for supplying steam to the pipes 25. The pipe 40, is provided with a valve 41 for controlling the supply of steam to the pipe 25.

The pipe 25 between the plugs 11 and 16 is provided with a series of openings 41 which are, as shown, arranged staggering, and as the said pipe is rotated the steam passes from the opening 41 and is thoroughly sprayed to all parts of the boiler, and thus the soot and scale is washed from the outer face of the tubes.

In boilers where the tubes are arranged a sufficient distance apart to allow the extra pipe to be placed between the tubes, and it is desired to place my improved cleaner in the boiler, holes are bored in the heads and short pipes 42 are secured therein in the usual manner of securing the tubes to the heads, and the pipe 25 passes through the said tubes and operates in the same manner as that heretofore described.

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

1. The combination with a water tube boiler, of a rotatable pipe mounted within said boiler between the tubes and parallel therewith, and means for supplying the pipe with steam and rotating the same.

2. The combination with a water tube boiler, of a rotatable perforated pipe mounted within said boiler between the tubes and parallel therewith.

3. The combination with a water tube boiler, of a rotatable perforated pipe mounted within the boiler between the tubes and parallel therewith, the said pipe extending through the front wall of the boiler, a sprocket wheel keyed upon said extended portion of the pipe, a sprocket chain for rotating the sprocket, and a steam supply having a flexible connection with the outer end of the pipe.

4. The combination with a water tube boiler composed of a front and rear head connected by water tubes, of means for rotatably mounting a pipe within the space occupied by one of the tubes for washing the outside of the remaining tubes.

5. The combination with a water tube boiler, composed of front and rear heads connected by water tubes, of means for rotatably mounting a pipe within the openings formed by the removal of one of the tubes, for washing the outside of the remaining tubes.

6. The combination with a water tube boiler, composed of front and rear heads connected by water tubes, of plugs mounted within the openings formed by the removal of one of the tubes, a steam pipe rotatably mounted within said heads and having openings for spraying steam upon the tubes for removing soot and scale therefrom.

7. The combination with a water tube boiler composed of a front and rear head, connected by water tubes, of plugs mounted within the openings in the heads upon the removal of one of the tubes, a steam pipe rotatably mounted within said heads and having openings for spraying steam upon the tubes, said pipe extending outwardly from the front head, means for rotating said pipe, and means for supplying steam to said pipe.

8. The combination with a water tube boiler, composed of a front and rear head connected by water tubes having one of the tubes removed, a short tube within the opening in the rear head formed by the removal of the tube, a plug expanding said short tube and having a recess in its inner face, a short tube within the opening in the rear wall of the front head, a plug within said tube and expanding the same to form a tight joint with the head, said plug having a screw-threaded opening therein, a pipe screwed within the opening in said plug and extending outwardly through the opening in the front wall of the head, a plug surrounding the said tube, means for clamping said plug tightly against the inner face of the inner wall, a packing within the plug for forming a tight joint with the tube, means carried by the plug for expanding said packing, a pipe extending through the tube in the front head and entering the recess in the plug in the rear head, and having openings therein intermediate the heads, means for supplying steam to the outer end of said pipe, and means for rotating said pipe whereby the steam is sprayed upon all the tubes to remove the soot and scale therefrom.

9. The combination with a water tube boiler, comprising a front and rear head connected by water tubes having one of the tubes removed, a bearing secured within the tube opening in the rear head, a short tube within the opening in the rear wall of the front head, a plug within the said short tube and expanding the same to form a tight joint with the head, said plug having a screw-threaded opening therein, a pipe screwed within said opening in said plug and extending outwardly through the opening in said plug, and extending outwardly through the opening in the front wall of the head, a plug surrounding the said tube, means for clamping said plug tightly against the inner face of the inner wall, a packing within the plug for forming a tight joint with the tube, means carried by the plug for expanding said packing, a pipe extending through the tube in the front head and entering the recess in the plug in the rear head, and having openings therein intermediate the heads, means for supplying steam to the outer end of said pipe, and means for rotating said pipe whereby the steam is sprayed upon all the tubes to remove the soot and scale therefrom.

In testimony whereof I affix my signature in presence of two witnesses.

GILBERT PATTERSON.

Witnesses:
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