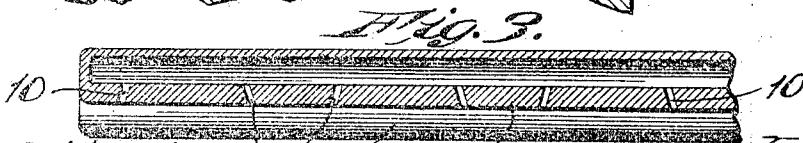
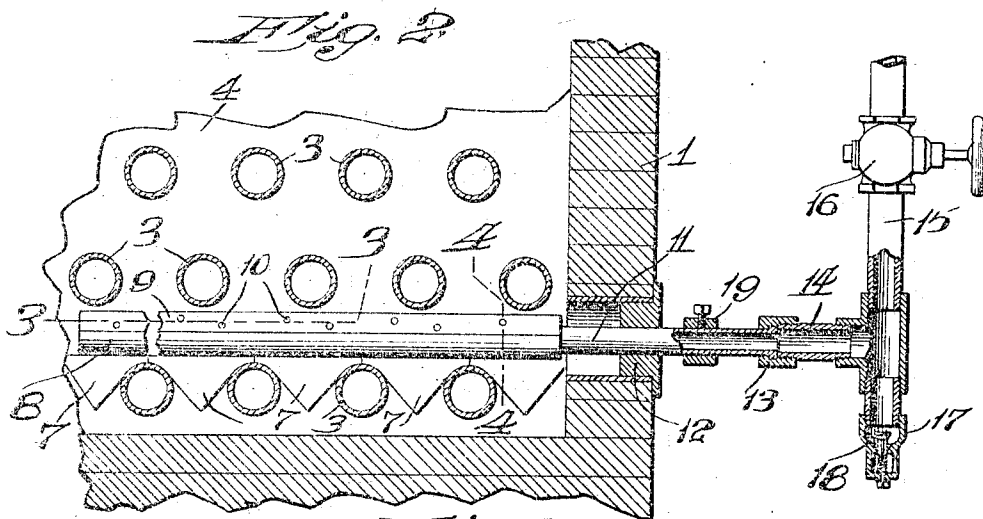
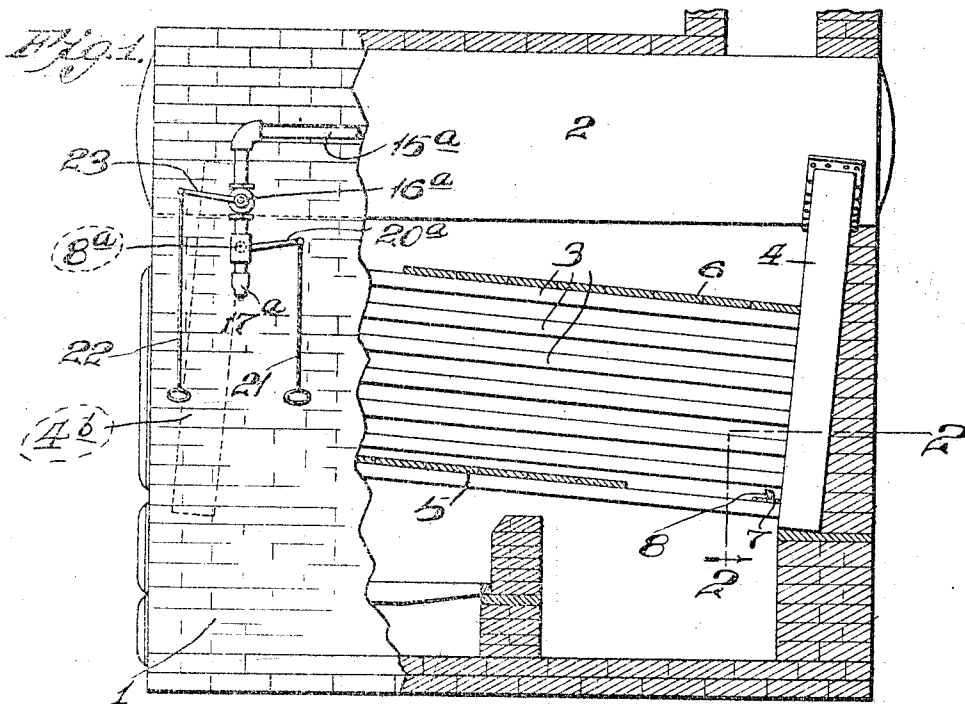


955,870.

Patented Apr. 26, 1910.

3 SHEETS—SHEET 1.



Attest.
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BOILER TUBE CLEANER.
APPLICATION FILED JAN. 25, 1909.

955,870.

Patented Apr. 26, 1910.

2 SHEETS—SHEET 2.

Fig. 4.

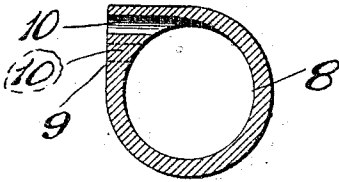


Fig. 5.

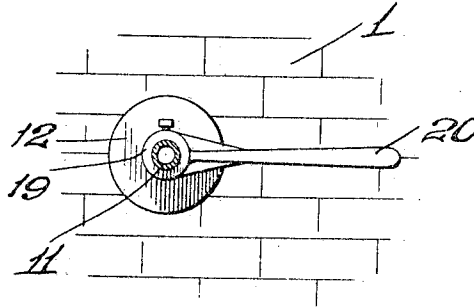


Fig. 6.

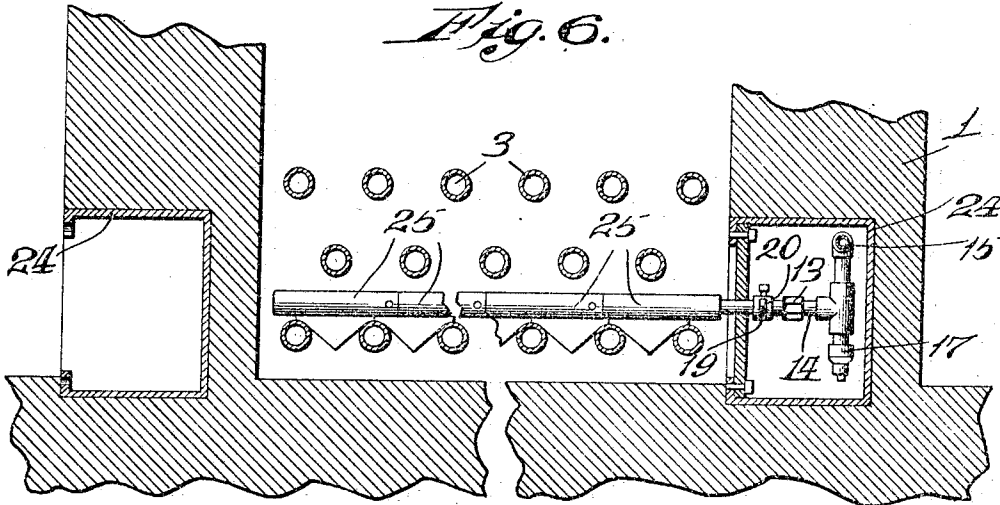


Fig. 7.

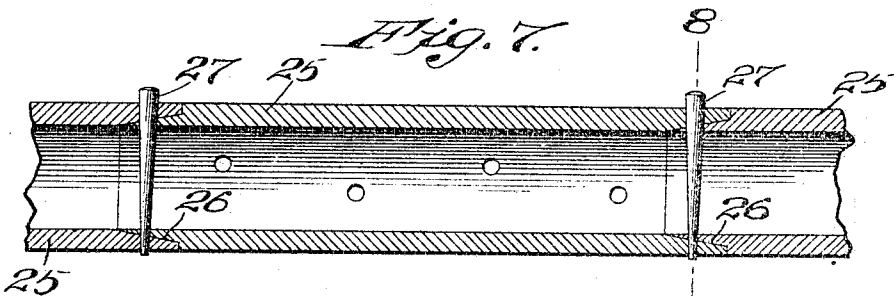
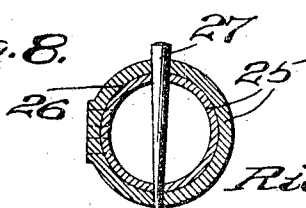


Fig. 8.



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BOILER-TUBE CLEANER.

955,870.

Specification of Letters Patent. Patented Apr. 26, 1910.

Application filed January 25, 1909. Serial No. 474,023.

To all whom it may concern:

Be it known that I, RICHARD W. HAMANN, a citizen of the United States, and resident of St. Louis, Missouri, have invented certain new and useful Improvements in Boiler-Tube Cleaners, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to a boiler tube cleaner, the object of my invention being to construct a simple apparatus particularly adapted for use in connection with water tube boilers and which apparatus is utilized for directing jets of steam or compressed air on to and between the water tubes of a boiler in order to remove all soot, ashes and like accumulations which interfere with the natural draft and heating capacity of the boiler.

To the above purpose my invention consists in certain novel features of construction and arrangement of parts which will be hereinafter more fully set forth, pointed out in the claims and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation partly in section of a boiler furnace, the same being equipped with my improved cleaning apparatus; Fig. 2 is an enlarged vertical section taken on the line 2—2 of Fig. 1; Fig. 3 is an enlarged section taken on the line 3—3 of Fig. 2; Fig. 4 is an enlarged cross section taken on the line 4—4 of Fig. 2; Fig. 5 is an elevation of a handle utilized for rocking the nozzle of my improved cleaner; Fig. 6 is a vertical section similar to Fig. 2 showing the construction employed where my improved cleaner is utilized on a battery of boilers; Fig. 7 is a section taken through the center of a modified form of the nozzle, and Fig. 8 is a cross section taken on the line 8—8 of Fig. 7.

Referring by numerals to the accompanying drawings, 1 designates the boiler setting, 2 the boiler, 3 the water tubes, and 4 the rear water leg to which the tubes 3 are connected.

Located on the lower row of water tubes 3, immediately over the fire box is a layer 5 of tile which deflects the products of combustion from the fire within the fire box rearward, and located on the top row of water tubes 3 at the rear portion of the boiler, is a layer 6 of tile which causes the

products of combustion to pass toward the forward end of the tubes 3 after passing around the rear end of the layer 5 of tile.

Supported by the lower row of tubes 3, immediately adjacent the lower end of the water leg 4, is a series of tile blocks 7 and arranged to rock thereon is a transversely disposed tubular nozzle 8 on which is formed a longitudinally disposed rib 9, and formed through this rib is a row of jet apertures 10, the same being preferably arranged at slight angles relative to the axis of the tubular nozzle in order that the jets of steam or compressed air issuing from said apertures will readily pass between the uppermost rows of boiler tubes, which rows are staggered relative to one another. One end of this tubular nozzle is closed and the opposite end is connected to a horizontally disposed pipe 11 which is arranged to rock in a bearing 12 located in the corresponding side wall of the boiler setting 1 and the outer end of said pipe 11 is connected by a slip joint 13 to a horizontally disposed tubular extension 14 connected to a fluid pressure supply pipe 15 in which is located an ordinary cut-off valve 16. Connected to the lower end of this supply pipe 15 is an air inlet valve housing 17 in which is arranged for operation a normally opened spring held valve 18, which closes upon its seat within the housing 17 when the fluid pressure is turned on through the supply pipe 15. Fixed upon the pipe 11 is a collar 19 and formed integral therewith is a handle 20 by means of which the pipe 11 and tubular nozzle are rocked when the device is in use.

The tubular nozzle 8 constructed as described is arranged on the row of tile blocks 7 in such a position as the jet openings 10 will discharge jets of steam or compressed air over the layer of tile 5 and upward between the water tubes 3 above said row of tile. And to remove soot, ashes and like accumulations from the row of tile 6, I provide a second tubular nozzle, such as 8*, which is arranged to rock on top of the uppermost row of water tubes 3, immediately behind the front water leg 4, and the jet openings in this last mentioned tubular nozzle are positioned so as to direct jets of steam or compressed air over the horizontal row of tiles 6 and through the space beneath the boiler 2. The outer end of this tubular nozzle 8* is connected to a fluid pres-

sure supply pipe 15^a which is provided with a valve 16^a and connected to said supply pipe is a normally opened air inlet valve 17^a. This tubular nozzle is rocked by means of a handle 21 which is connected to the handle 20^a which corresponds to the handle 20 previously described, and the valve 16^a is actuated by means of a handle 22 pivotally connected to the outer end by a lever 23 which is fixed on the stem of said valve 16^a.

Where my improved cleaning device is applied to a battery of boilers and it is not possible to connect the tubular nozzle with a supply pipe at the side of the boiler setting, metal boxes 24 are located in the side walls of the boiler settings and the fluid pressure supply pipes 15 are extended through the end walls of the boiler settings and connected to the pipes 14 within said boxes 24, which arrangement is clearly shown in Fig. 6. In this form of cleaning device the tubular nozzle is made up of a series of short tubular sections 25, one end of each section being tapered as designated by 26 in order to fit into the corresponding tapered opening formed in the opposite end of an adjacent section, and to lock the various sections to one another, keys or pins 27 are inserted through coinciding apertures formed in the ends of said sections 25. (See Figs. 7 and 8.)

When my improved cleaner is in use the valve 16 is opened to turn on the steam or compressed air through the supply pipe 15 and said steam or compressed air passes into the tubular nozzle 8 and issues from the jet openings 10 formed therein. The handle 20 is now engaged and the tubular nozzle is rocked slightly, thus causing the jets of steam or compressed air to blow over the layer of tile 5 and upward between the water tubes 3 thus removing the soot, ashes and like accumulations, and causing same to pass to the forward portion of the boiler setting with the natural and forced draft through said setting and said soot and ashes are carried upward into the space between the layer of tile 6 and the boiler shell 2. When the valve 16^a is opened and the tubular nozzle 8^a is rocked, jets of steam or compressed air will be directed over the layer of tile 6 and through the space between said layer of tile and the boiler shell 2 thus effectually removing all of the soot, ashes and like accumulations from the interior of the boiler setting and causing said accumulation to pass to the stack.

The tubular nozzle can be operated independently or simultaneously to effect the cleaning out operation and when the valves in the fluid pressure supply pipes leading to said nozzles are closed, the air inlet valves connected to said fluid pressure supply pipes are automatically opened to permit air to enter said tubular nozzles and dis-

charge through the jet openings thereof, thus maintaining said nozzles in a comparatively cool condition. The row of tile blocks serve as a support for the nozzle 8 and also serve to protect the same against the intense heat of the flame and products of combustion which pass to the rear of the layer of tile 5. The jet openings 10 are formed on slight angles in order to cause the jets of steam or compressed air to travel on angle over the surfaces of the tubes 3 and thus effect a more perfect cleaning action than where the jets are projected on direct line against the surfaces of said tubes.

The tubular nozzles while in use are heated to a considerable degree and where steam is used as a medium for effecting the cleaning operation, said steam will issue from the jet openings in a comparatively dry condition owing to said steam being superheated within the tubular nozzles.

A cleaning device of my improved construction is comparatively simple, is easily installed, can be applied to either a single boiler or a battery of boilers, is especially applicable for water tube boilers such as are in general use and provides simple means for thoroughly removing the soot, ashes and like accumulations from the tile partitions and the water tubes and blowing said accumulation into the stack leading from the boiler furnace.

In an application filed by me on September 3, 1908, serially numbered 451,616, I have claimed:—the air inlet valve shown herein, in combination with a nozzle adapted to discharge into the flues of a boiler, the air inlet valve being for the purpose of cooling the nozzle when not in use.

I claim:

1. The combination with a water tube boiler and its setting of a tubular nozzle transversely disposed at one end of the boiler between the tubes thereof, there being a row of jet openings formed in said tubular nozzle, means whereby said nozzle is rocked, fluid pressure pipe connected to said nozzle and a row of fire proof blocks forming support for said tubular nozzle.

2. The combination with a water tube boiler and its setting, of a tubular nozzle transversely disposed at one end of the boiler between the tubes thereof, there being jet openings formed in said tubular nozzle, fluid pressure supply pipe, a pivoted connection between said fluid pressure supply pipe and said nozzle whereby said nozzle may be rocked without interrupting the passage of the fluid pressure into said nozzle an operating handle for rocking said nozzle and means for protecting the nozzle against the heat within the boiler.

3. The combination with a water tube boiler and its setting, of a tubular nozzle disposed within the boiler furnace adjacent the

tubes to be cleaned, there being jet openings formed in said tubular nozzle, a fluid pressure supply pipe, a pivoted connection between said nozzle and said fluid pressure supply pipe whereby the former is movable with respect to the fluid pressure supply pipe, a duct or passage formed through said connection for the fluid pressure entering said nozzle through the pivoted connection between said nozzle and said supply pipe, whereby said nozzle may be rocked without interrupting the passage of the fluid pressure through said connection, an operating handle for rocking said nozzle and a covering for the nozzle to protect it against the heat within the boiler.

4. The combination with a water tube boiler and its setting, of a tubular nozzle disposed within the boiler furnace adjacent the tubes to be cleaned, there being jet openings formed in said tubular nozzle, a series of fire-proof blocks disposed beneath said nozzle, a fluid pressure supply pipe, a connection between said nozzle and said fluid pressure supply pipe whereby the former is movable with respect to the fluid pressure supply pipe, a duct or passage formed through said connection for the fluid pressure entering said nozzle through the pivoted connection between said nozzle and said supply pipe, whereby said nozzle may be rocked without interrupting the passage of the fluid pressure through said connection, and an operating handle for rocking said nozzle.

5. A device of the class described, comprising a tubular nozzle provided with a series of jet openings, said nozzle adapted to be disposed in a boiler furnace adjacent the surfaces to be cleaned, a heat protecting shield for said nozzle, a supply pipe for supplying gaseous fluid under pressure to said nozzle, a pivoted connection between said nozzle and said fluid pressure supply pipe whereby the former is movable with respect

to the fluid pressure supply pipe, a duct or passage formed through said connection for the fluid pressure entering said nozzle through the pivoted connection between said nozzle and said supply pipe, whereby said nozzle may be rocked without interrupting the passage of the fluid pressure through said connection, and an operating handle for rocking said nozzle.

6. The combination with a water tube boiler and its setting, of two tubular nozzles transversely disposed at each end of the boiler, there being jet openings formed in each of said tubular nozzles, a fluid pressure supply pipe for supplying fluid under pressure to said nozzles, a pivoted connection between each of said nozzles and said fluid pressure supply pipe whereby each of said nozzles may be rocked independently without interrupting the passage of the fluid pressure entering said nozzles, operating handles for rocking said nozzles, a plurality of heat insulating blocks supported by the boiler tubes to protect the nozzles against the heat within the boiler.

7. The combination with a series of water tube boilers and their settings, of a tubular nozzle provided with a series of jet openings positioned in each boiler furnace adjacent the surfaces to be cleaned, a fluid pressure supply pipe, connections between said nozzles and said fluid pressure supply pipe whereby said nozzles may be rocked without interrupting the passage of the fluid under pressure from the supply pipe to the nozzles, and housings for said connections located adjacent the partition wall of the boiler settings.

In testimony whereof, I have signed my name to this specification, in presence of two subscribing witnesses.

RICHARD W. HAMANN.

Witnesses:

M. P. SMITH,

E. L. WALLACE.