

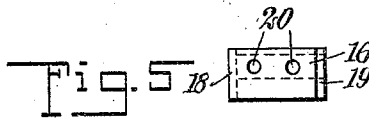
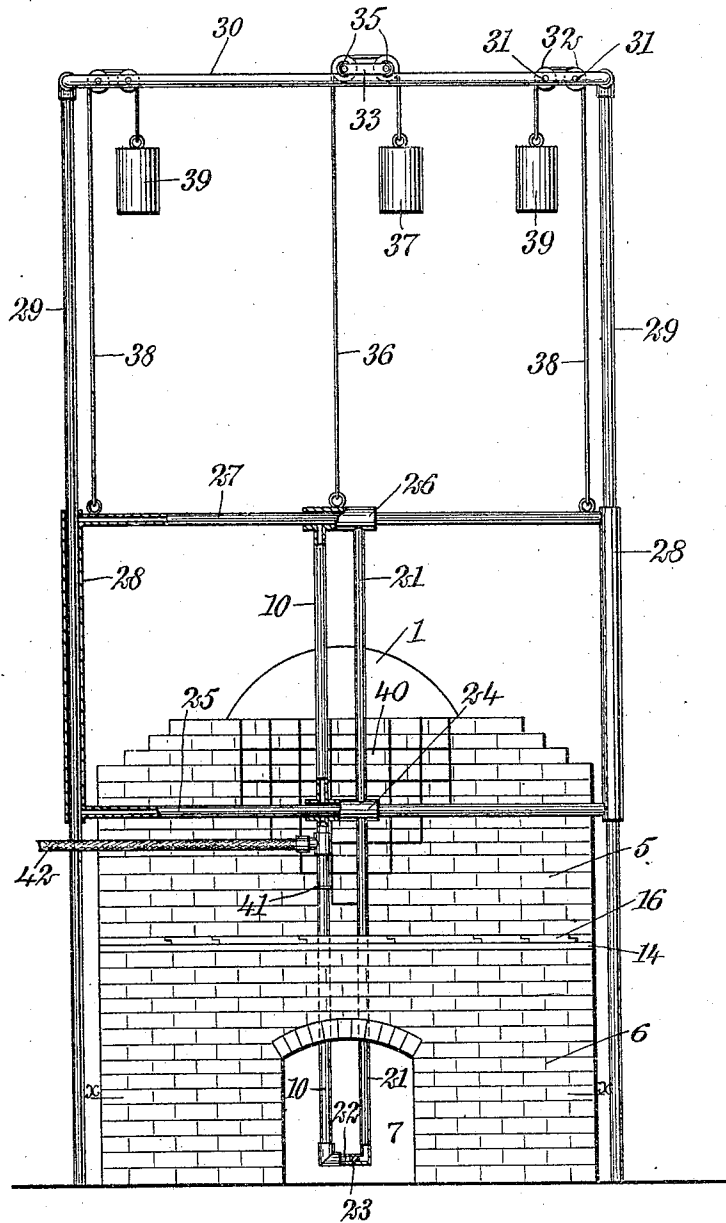
J. D. THOMPSON.
BOILER TUBE CLEANER.
APPLICATION FILED FEB. 13, 1909.

938,289.

Patented Oct. 26, 1909.

2 SHEETS—SHEET 1.

Fig. 1



WITNESSES
J. A. Proply
E. B. Marshall

INVENTOR
James D. Thompson
BY *Mumfles*
ATTORNEYS

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2 SHEETS—SHEET 2.

Fig. 2

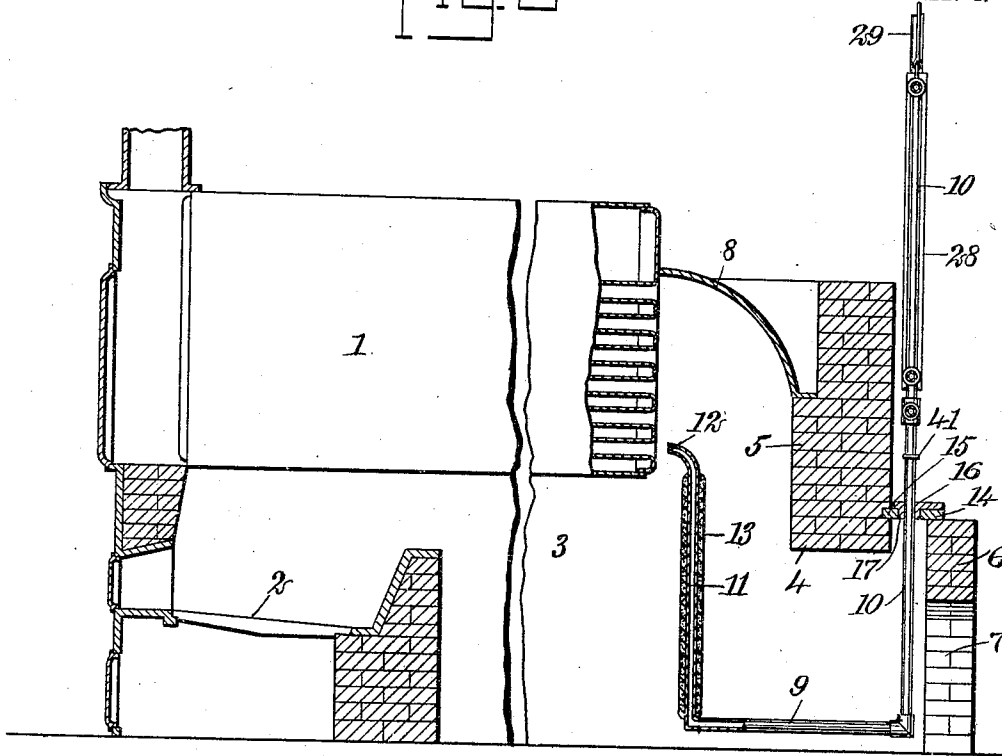


Fig. 3

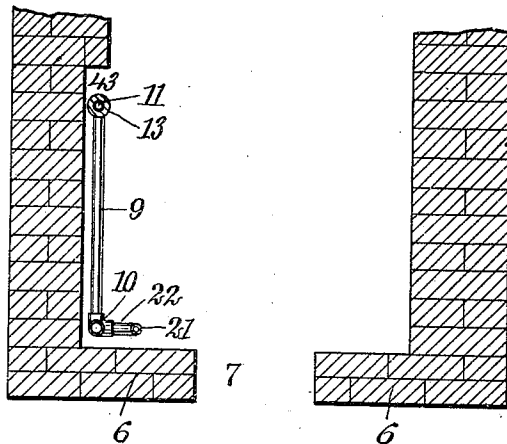
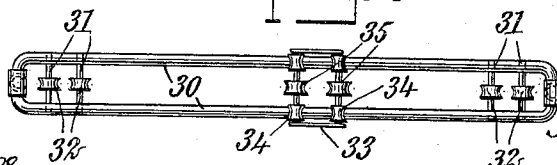


Fig. 4



WITNESSES
J. A. Prophy
E. B. Marshall

INVENTOR
James D. Thompson
BY *Mumolo*
ATTORNEYS

UNITED STATES PATENT OFFICE.

JAMES DAVID THOMPSON, OF EUREKA, CALIFORNIA.

BOILER-TUBE CLEANER.

938,289.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed February 13, 1909. Serial No. 477,556.

To all whom it may concern:

Be it known that I, JAMES DAVID THOMPSON, a citizen of the United States, and a resident of Eureka, in the county of Humboldt and State of California, have invented a new and Improved Boiler-Tube Cleaner, of which the following is a full, clear, and exact description.

My invention relates to boiler tube cleaners, and it has for its object to provide a cleaner for boiler tubes, which is adapted for directing a jet of steam through the boiler tubes from their rear, it being possible to use the cleaner without dismantling the boiler or furnace in any manner and without drawing the fire from the furnace.

Still another object of the invention is to provide means which will indicate the position of the nozzle relatively to the boiler tubes, at all times.

Still other objects of the invention will appear in the following complete description.

In this specification I will describe the preferred form of my invention, but it will be understood that I do not limit myself thereto, as I consider myself entitled to all forms and embodiments of the invention which may be held to fall within the scope of the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, in which—

Figure 1 is an elevation of my invention as applied to the rear of a furnace; Fig. 2 is a sectional side elevation of a furnace and a boiler to which my invention is applied; Fig. 3 is a plan view on the line $x-x$ of Fig. 1; Fig. 4 is a plan view of the upper portion of the frame for the guides; and Fig. 5 is a plan view of one of the plates through which the tubes are disposed.

By referring to the drawings, it will be seen that a tubular boiler 1 is provided, which is disposed in the usual manner, with a grate 2 thereunder and a furnace 3 constructed in the usual manner with the exception of the rear wall, the lower portion of which is cut away below a point 4, and beyond this rear wall 5 of the furnace there is an auxiliary wall 6 spaced from the wall 5 and extending a short distance above the lower plane 4 of the wall 5. In this aux-

iliary wall 6 there is provided a doorway 7, to permit of the furnace being cleaned. The boiler is connected with the rear wall 5 of the furnace by the usual furnace plate back 8. A U-shaped pipe 9 is provided, one arm 10 of which extends upwardly in the space between the rear furnace wall 5 and the auxiliary furnace wall 6, and the other arm 11 extends upwardly in close proximity to the rear of the boiler 1, this arm 11 having a nozzle 12 on its terminal. The arm 11 of the pipe 9 is covered with asbestos, or other suitable material 13, to prevent its being unduly heated by the gases of the furnace.

On the top of the auxiliary wall 6 there is a bar 14, and embedded in the wall 5, opposite the bar 14, there is a similar bar 15, the arm 10 of the U-shaped pipe 9 extending upwardly between these bars, the bars forming a base for plates 16, which are disposed thereon to inclose the furnace at this point. These plates 16 have projecting portions 17 which fit loosely between the bars 14 and 15, the under side of the plates 16 resting on the said bars 14 and 15. In a similar way the plates interlock with each other, each plate having a tongue 18 which fits in a recess 19 in a neighboring plate. In one of the plates 16, there are two orifices 20, in one of which the arm 10 of the U-shaped pipe 9 is disposed and in the other is disposed an auxiliary pipe 21, the auxiliary pipe 21 extending down to the horizontal plane of the lower terminal of the arm 10, at which point the auxiliary pipe 21 is connected to the pipe 9, by means of a branch 22. In the branch 22, there is a plug 23, to prevent the steam from passing into the pipe 21, the pipe 21 serving to render the U-shaped pipe 9 and its connections, firm at all times. The arm 10 and the pipe 21 are connected to a sleeve 24 in which is disposed a rod 25 of a frame, the arm 10 of the U-shaped pipe 9 and the pipe 21 extending above the sleeve 24 and being secured to a second sleeve 26 in which is disposed a rod 27, the rods 25 and 27 being secured to sleeves 28, in which are disposed guide rods 29. The guide rods 29 are connected at their upper terminals by parallel frame members 30, there being journaled in the parallel frame members 30, near their outer terminals, short shafts 31 to which are secured pulleys 32. On the frame members 30 is disposed a small traveler 33 having concave rollers 34 which rest on the frame mem-

bers 30, and on the shafts to which the rollers 34 are journaled are freely mounted pulleys 35. To the sleeve 26 is secured a lanyard 36 which passes over the pulleys 35 on the traveler 33, there being a counterweight 37 secured to the other terminal of the lanyard 36. Lanyards 38 are secured to the rod 27, these lanyards 38 passing over the pulleys 32 and having counterweights 39 secured to their other terminals.

On the outside of the rear furnace wall 5 there is marked a diagram 40 which corresponds with the several boiler tubes in the boiler 1, and on the arm 10 of the U-shaped pipe 9, there is an indicator 41, the indicator 41 being provided so that when the arm 10 is moved to a position where the indicator 41 is disposed in close proximity to one of the squares in the diagram 40, the nozzle 12 will be in a position to direct a jet of steam into the corresponding tube in the boiler. A steam hose 42 is connected to the arm 10 of the U-shaped pipe 9 to furnish the steam which is to be directed through the boiler tubes. At one side of the furnace 3 there is a recess 43 in which the U-shaped pipe 9 may be disposed when not in use.

In using my invention, the plates 16 are shifted to permit the movement of the U-shaped pipe 9 from the recess 43 to a position in alinement with the plan of one of the vertical rows of boiler tubes, and the plates are immediately replaced to completely close the opening between the rear wall 5 and the auxiliary wall 6. When this is done the U-shaped pipe is raised or lowered as may be necessary, in order to bring the nozzle 12 in alinement with any particular tube in the vertical row of boiler tubes referred to. The steam is then turned on to permit it to flow through the U-shaped pipe and to pass through the nozzle 12 into the boiler tube. When the steam has been driven through the particular boiler tube for a sufficient length of time to clean the tube, the U-shaped pipe 9 is raised or lowered to permit the steam to be directed into a neighboring tube in the same column, and so on until all the tubes in the column are cleaned, when the plates 16 are again shifted to permit of the movement of the U-shaped pipe 9 laterally in order that the nozzle may direct the steam to a tube in an adjoining column of tubes, which are then cleaned. The other columns of tubes are cleaned in the same manner.

In using the invention it will be found that the counterweights 37 and 39 will support the frame and the U-shaped pipe 9, so that after the nozzle has been moved to the desired position it is no longer necessary to handle the pipe, as the U-shaped pipe 9 will remain in this position until the members are again moved to permit the nozzle to direct the steam into another tube.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a boiler tube cleaner, in combination with a tubular boiler, a furnace, a nozzle which is adapted for directing a steam jet from a position in alinement with any one of the tubes of the boiler within the furnace, means for moving the nozzle vertically and horizontally so that the nozzle may register with any one of the plurality of tubes in the boiler, and means without the furnace which are adapted for indicating the position of the nozzle in the furnace.

2. In a boiler tube cleaner, a boiler, a furnace in connection therewith, a nozzle in the furnace, which is adapted for directing a steam jet into any one of a plurality of tubes in a boiler, a pipe connecting the nozzle with a steam supply without the furnace, the pipe passing through a plate which forms a unit in a cover for an opening in the furnace, means for indicating the position of the nozzle in the furnace, and means for moving the pipe, whereby the nozzle is disposed in the desired position.

3. In a boiler tube cleaner, in combination with a boiler having a plurality of rows of tubes, a furnace, a nozzle adapted for directing a jet of steam into any one of the said tubes from a position substantially in alinement therewith, a pipe leading from the nozzle to a source of steam supplied without the furnace, and means for moving the pipe vertically and horizontally whereby the nozzle is disposed in the desired position.

4. In a boiler tube cleaner, in combination with a boiler having a plurality of rows of boiler tubes, a furnace, a nozzle adapted to move vertically and horizontally to register with any one of the tubes of the boiler for directing a jet of steam therein, there being an elongated opening in the furnace, a pipe secured to the nozzle by which the nozzle is fed with steam and its position is regulated, the pipe passing through the opening in the furnace, plates to cover the opening in the furnace, and means without the furnace for indicating the position of the nozzle.

5. In a boiler tube cleaner, in combination with a boiler, a furnace, a nozzle adapted to move vertically and horizontally to register with any one of the tubes for directing a jet of steam therein, there being an elongated opening in the furnace, a pipe secured to the nozzle by which the nozzle is fed with steam and its position is regulated, plates to cover the opening in the furnace, the pipe passing through an orifice in one of the plates, and means without the furnace for indicating the position of the nozzle.

6. In a boiler tube cleaner, a furnace, a boiler in connection therewith having a plurality of rows of tubes, a nozzle adapted

for directing a jet of steam into any one of the tubes of the boiler, there being an elongated opening in the furnace, a pipe secured to the nozzle by which the nozzle is fed with steam, plates to cover the opening in the furnace, the pipe passing through an orifice in one of the plates, and means without the furnace for indicating the position of the nozzle, some of the plates being adapted for covering the portions of the elongated opening which are substantially equal to the distance between the centers of tubes disposed in the same row, the elongated opening being parallel with the plane of the inner terminals of the tubes.

7. In a boiler tube cleaner, in combination with a boiler having a plurality of rows of tubes, a furnace, a nozzle adapted to be moved vertically and horizontally for directing a jet of steam into any one of the said tubes from a position substantially in alinement therewith, means for moving the nozzle to the desired position, and a counterweight by which the said means is balanced.

8. In a boiler tube cleaner, in combination with a tubular boiler, a furnace, a nozzle adapted to be moved vertically and horizontally for directing a jet of steam into any one of the tubes of the boiler from a position substantially in alinement therewith, means for moving the nozzle to the desired position, and a counterweight by which the means is balanced.

9. In a boiler tube cleaner, a furnace, a boiler in connection therewith having a plurality of rows of tubes, a nozzle adapted for directing a jet of steam into any one of the tubes, means for moving the nozzle to the desired position, an indicator thereon, a diagram without the furnace which in connection with the indicator is adapted for showing the position of the nozzle relatively to the tubes in the boiler, and a counterweight by which the said means are balanced.

10. In a boiler tube cleaner, in combination with a boiler having a plurality of rows of tubes, a furnace, a nozzle adapted to be moved vertically and horizontally for directing a jet of steam into any one of the tubes, means to move the nozzle to the desired position and to supply it with steam from without the furnace, a frame without the furnace by which the means is supported, guides for the frame, and a counterweight for the frame.

11. In a boiler tube cleaner, in combination with a tubular boiler, a furnace, a nozzle which is adapted to be moved vertically and horizontally so that it may register with any one of the tubes of the boiler to direct a jet of steam therein, a longitudinal opening in the furnace, a pipe connected to the nozzle which is disposed in the opening and is adapted to move the nozzle to the desired

position, plates for covering the opening, there being an orifice in one of the plates for the pipe, a frame without the furnace, which supports the pipe, and guides and a counterweight for the frame.

12. In a boiler tube cleaner, a furnace, a boiler in connection therewith having a plurality of rows of tubes, a nozzle adapted for directing a jet of steam into any one of the tubes, a pipe connected to the nozzle, the pipe serving to supply steam to the nozzle and being also adapted for moving the nozzle to the desired position relatively to the tubes, the pipe passing to the exterior of the furnace, a frame without the furnace by which the pipe is supported, guides and a counterweight for the frame, an indicator connected with the pipe, and a diagram without the furnace which in connection with the indicator is adapted for showing the position of the nozzle relatively to the tubes.

13. In a boiler tube cleaner, a tubular boiler, a furnace in connection therewith, a portion of the rear wall of the furnace being set off, there being a horizontal opening in the set off portion of the furnace, a nozzle adapted for directing a jet of steam into the tubes of the boiler respectively, a U-shaped pipe, one terminal of which is connected to the nozzle, the other terminal extending through the horizontal opening, plates adapted for covering the opening, the pipe extending through an orifice therein, a frame which supports the outer terminal of the pipe, the pipe having a sliding engagement with the frame to permit it to travel relatively thereto, guides for the frame, and means for supporting the frame.

14. In a boiler tube cleaner, a tubular boiler, a furnace in connection therewith, a portion of the rear wall of the furnace being set off, there being a horizontal opening in the set off portion of the furnace, a nozzle adapted for directing a jet of steam into the tubes of the boiler respectively, a U-shaped pipe, one terminal of which is connected to the nozzle, the other terminal extending through the horizontal opening, plates adapted for covering the opening, the pipe extending through an orifice therein, a frame which supports the outer terminal of the pipe, the pipe having a sliding engagement with the frame to permit it to travel relatively thereto, guides for the frame, means for supporting the frame, and means without the furnace adapted for indicating the position of the nozzle relatively to the tubes.

15. In a boiler tube cleaner, a tubular boiler, a furnace in connection therewith, a portion of the rear wall of the furnace being set off, there being a horizontal opening in the set off portion of the furnace, a nozzle

adapted for directing a jet of steam into the tubes of the boiler respectively, a U-shaped pipe, one terminal of which is connected to the nozzle, the other terminal extending
5 through the horizontal opening, plates adapted for covering the opening, the pipe extending through an orifice therein, a frame which supports the outer terminal of the pipe, the pipe having a sliding engagement
10 with the frame to permit it to travel relatively thereto, guides for the frame, means for supporting the frame, an indicator connected with the outer terminal of the U-shaped pipe, and a diagram which in con-
15 nection with the indicator is adapted for

showing the position of the nozzle relatively to the tubes of the boiler.

16. In a boiler tube cleaner, a frame having a rod, a pipe having a sleeve which slides on the said rod, a nozzle at one terminal of the pipe, and means to move the frame at right angles to the said rod. 20

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

JAMES DAVID THOMPSON.

Witnesses:

W. A. ELSEMORE,
C. H. PALMTAG.