No. 887,935. PATENTED MAY 19, 1908.

W. A. GREENLAW.

DEVICE FOR CLEANING BOILER TUBES.

APPLICATION FILED AUG. 19, 1907.

Fig. 1

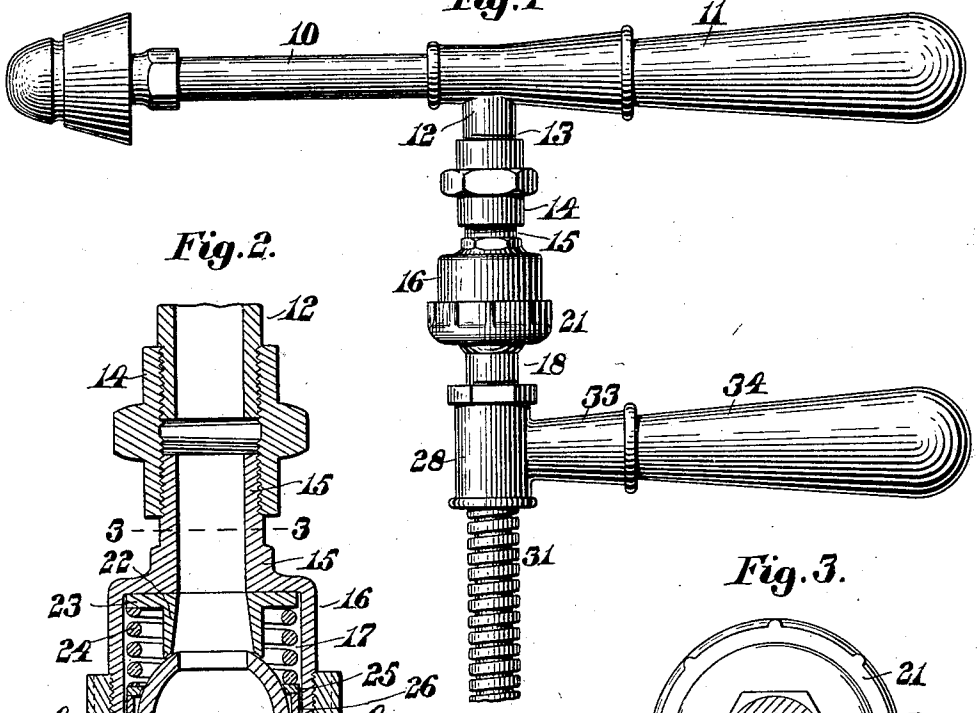


Fig. 2.

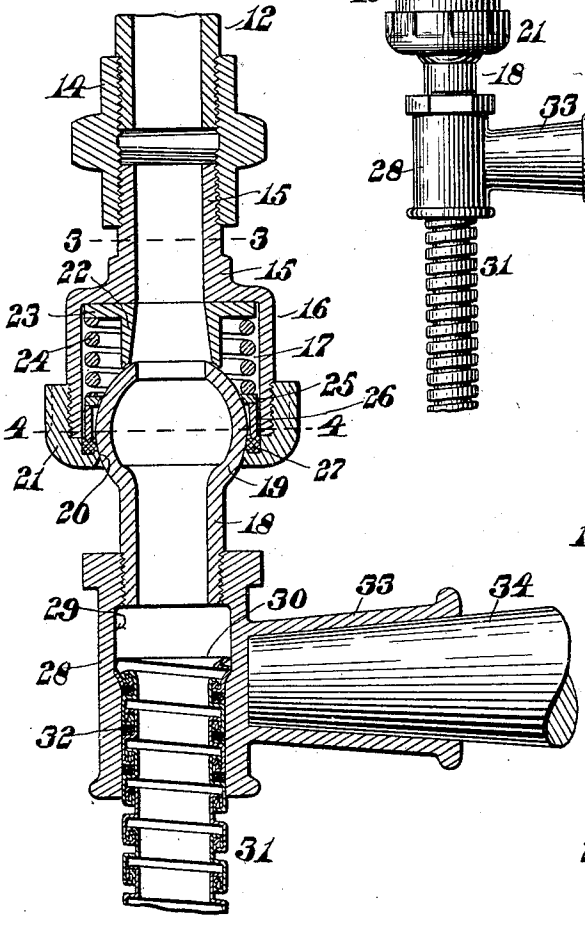


Fig. 3.

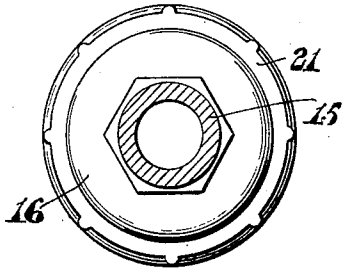
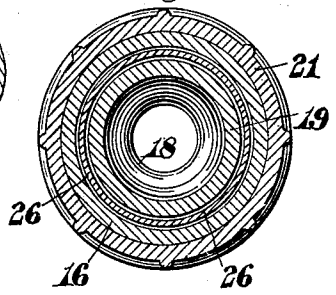


Fig. 4.



Witnesses:

Nathan C. Lombard

Samuel J. Arkin.

Inventor:

Warren A. Greenlaw,

by Walter E. Lombard,

Atty.

THE NORRIS PETERS CO., WASHINGTON, D. C

UNITED STATES PATENT OFFICE.

WARREN A. GREENLAW, OF MELROSE HIGHLANDS, MASSACHUSETTS, ASSIGNOR TO THE GREENLAW MANUFACTURING CO., OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

DEVICE FOR CLEANING BOILER-TUBES.

No. 887,935. Specification of Letters Patent. Patented May 19, 1908.

Application filed August 19, 1907. Serial No. 389,313.

To all whom it may concern:

Be it known that I, WARREN A. GREENLAW, a citizen of the United States of America, and a resident of Melrose Highlands, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Devices for Cleaning Boiler-Tubes, of which the following is a specification.

This invention relates to devices for cleaning the tubes of boilers and particularly to that class of tube cleaners which utilizes steam or some similar gas under high pressure for blowing out from the tube the soot or other residue accumulated therein. The devices now in use for this purpose are connected directly to a flexible tube which is adapted to convey to the nozzle the steam or other gas under high pressure used in cleaning the tube. In such devices a serious objection has been found inasmuch as it is necessary in cleaning the tube to manipulate the nozzle to different angles and in doing this the flexible tube is weakened at the point where it is connected with the nozzle and soon becomes injured to such an extent as to leak and make the device unserviceable, or as is often the case is broken away entirely from the nozzle.

To overcome these objections is the object of the present invention which consists in providing between the flexible tube and the nozzle a flexible joint which will permit steam or other similar medium to pass freely from the flexible tube to the nozzle while at the same time the nozzle is free to be moved into any desired angle relative to the end of the flexible tube without injury to the same.

The invention further consists in certain novel features of construction and arrangement of parts which will be readily understood by reference to the description of the drawings and to the claims hereinafter given.

Of the drawings: Figure 1 represents an elevation of a device embodying the features of this invention. Fig. 2 represents a vertical section of a portion of the same showing the flexible joint between the nozzle and the flexible tube, the same being drawn to an enlarged scale. Fig. 3 represents a transverse section, the cutting plane being on line 3—3 on Fig. 2, and Fig. 4 represents a transverse section, the cutting plane being on line 4—4 on Fig. 2.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 10 represents a nozzle used for the purpose of cleaning tubes which nozzle may be of any well-known construction, the same being provided with a suitable handle and having a side inlet 12 which is threaded at 13 to receive a coupling 14, the opposite end of which has threaded thereto the pipe member 15 provided with a cup-shaped end 16 having a chamber 17 in axial line with said pipe member 15.

A second pipe member 18 is provided with a ball end 19 adapted for insertion within the chamber 17. This ball end 19 is provided with a seat 20 on the cap 21 threaded to the cup-shaped end 16 of the pipe member 15, said seat 20 preventing the separation of said pipe members 15 and 18 and the withdrawal of the ball end 19 from the chamber 17.

The inward movement of the ball end 20 is limited by the tubular ball stop 22 formed upon the removable annular plate 23 held in position against the bottom of the chamber 17 by means of the spring 24 within said chamber. The opposite end of the spring 24 bears against the annular follower 25 resting upon the annular ring 26 the lower edges of which are beveled and extend into the packing ring 27 held in position in a recess in the cap 21. The pressure of the medium passing through the pipe members and the chamber 17 tends to force the beveled edges of the ring 26 into the packing 27 to force this member firmly against the exterior surface of the ball 19 to securely pack the joint between the ball end 19 and the cap 21 so that all leakage from the chamber 17 is effectually prevented.

The outer end of the pipe member 18 has threaded thereto the coupling 28 provided with an internal recess 29 into which the end 30 of the flexible pipe 31 is upset to prevent its removal from said coupling 28, the flexible tube 31 being soldered as at 32 into said coupling to make its permanent connection therewith more effectual.

The coupling member 28 is provided with a lateral branch 33 into which is fitted a suitable handle 34 by which the end of the flexible pipe or tube may be held while the nozzle 10 is being operated and moved to any desired angle therewith.

The devices within the chamber 17 pack the joint between the two pipe members 15

and 18 and prevent any leakage no matter at what angle the nozzle 10 may be to the flexible pipe 31. By gripping the handle 34 with one hand and the handle 11 with the other the nozzle 10 may be manipulated to any desired extent about the axis of the branch 12 or it may be moved into any desired angle with the axis of the flexible pipe 31, any of these movements being effected without any strain upon the flexible piping 31. As a consequence of the omission of all strain upon the flexible tube or piping 31 the nozzle 10 may be manipulated without injury to said pipe.

It is believed that from the foregoing the many advantages and the operation of the device will be fully apparent without any further description.

Having thus described my invention I claim:

1. In a boiler tube cleaner, the combination of a nozzle; a flexible tube adapted to supply a gas under high pressure to said nozzle; and a universal joint between said nozzle and tube adapted to permit the movement of said nozzle to any desired angle with said tube in any direction.

2. In a boiler tube cleaner, the combination of a nozzle; a flexible tube adapted to supply a gas under high pressure to said nozzle; a handle secured to the end of said tube; and a universal joint between said nozzle and tube adapted to permit the movement of said nozzle to any desired angle with said tube in any direction.

3. In a boiler tube cleaner, the combination of a nozzle member; a flexible tubular member adapted to supply a gas under high pressure to said nozzle; a pipe secured to one of said members and provided with an enlarged chamber; a pipe secured to the other member and provided with a ball end adapted to enter said chamber; and means for preventing the separation of said pipes.

4. In a boiler tube cleaner, the combination of a nozzle member; a flexible tubular member adapted to supply a gas under high pressure to said nozzle; a pipe secured to one of said members and provided with an enlarged chamber; a pipe secured to the other member and provided with a ball end adapted to enter said chamber; means for preventing the separation of said pipes; and means for packing the joint between said ball and the wall of said chamber.

5. In a boiler tube cleaner, the combination of a nozzle member; a flexible tubular member adapted to supply a gas under high pressure to said nozzle; a pipe secured to one of said members and provided with an enlarged chamber; a pipe secured to the other member and provided with a ball end adapted to enter said chamber; and a cap to said chambered pipe provided with a seat for said ball.

6. In a boiler tube cleaner, the combination of a nozzle member; a flexible tubular member adapted to supply a gas under high pressure to said nozzle; a pipe secured to one of said members and provided with an enlarged chamber; a pipe secured to the other member and provided with a ball end adapted to enter said chamber; a cap to said chambered pipe provided with a seat for said ball; and a packing for said ball in a recess in said cap.

7. In a boiler tube cleaner, the combination of a nozzle member; a flexible tubular member adapted to supply a gas under high pressure to said nozzle; a pipe secured to one of said members and provided with an enlarged chamber; a pipe secured to the other member and provided with a ball end adapted to enter said chamber; a cap to said chambered pipe provided with a seat for said ball; a packing for said ball in a recess in said cap; and means for forcing said packing into contact with the exterior surface of said ball.

8. In a boiler tube cleaner, the combination of a nozzle member; a flexible tubular member adapted to supply a gas under high pressure to said nozzle; a pipe secured to one of said members and provided with an enlarged chamber; a pipe secured to the other member and provided with a ball end adapted to enter said chamber; a cap to said chambered pipe provided with a seat for said ball; a packing for said ball in a recess in said cap; a ring with beveled edges adapted to act upon said packing to force it in contact with the exterior surface of said ball; and a spring interposed between the bottom of said chamber and said ring.

9. In a boiler tube cleaner, the combination of a nozzle member; a flexible tubular member adapted to supply a gas under high pressure to said nozzle; a pipe secured to one of said members and provided with an enlarged chamber; a pipe secured to the other member and provided with a ball end adapted to enter said chamber; a cap secured to said chambered pipe provided with a seat for said ball; and a ball stop in said chamber to limit the inward movement of said ball.

10. In a boiler tube cleaner, the combination of a nozzle member; a flexible tubular member adapted to supply a gas under high pressure to said nozzle; a pipe secured to one of said members and provided with an enlarged chamber; a pipe secured to the other member and provided with a ball end adapted to enter said chamber; a cap secured to said chambered pipe provided with a seat for said ball; and a removable ball stop in said chamber to limit the inward movement of said ball.

11. In a boiler tube cleaner, the combination of a nozzle; a flexible tube adapted to

supply a gas under pressure to said nozzle; a coupling secured to the end of said flexible tube; and a universal joint interposed between said coupling and said nozzle.

12. In a boiler tube cleaner, the combination of a nozzle; a flexible tube adapted to supply a gas under pressure to said nozzle; a coupling secured to the end of said flexible tube; a handle secured thereto; and a universal joint interposed between said coupling and said nozzle.

13. In a boiler tube cleaner, the combination of a nozzle; a flexible tube adapted to supply a gas under pressure to said nozzle; a coupling provided with an internal recess into which the end of said tube is adapted to be upset; and a flexible joint threaded thereto at one end and at the other secured to said nozzle.

14. In a boiler tube cleaner, the combination of a nozzle provided with a handle and a side inlet; a flexible tube adapted to supply a gas under pressure to said nozzle; a coupling provided with an internal recess into which the end of said tube is adapted to be upset; and a flexible joint threaded thereto at one end and at the other secured to the side inlet of said nozzle.

Signed by me at Boston, Mass., this 16th day of August, 1907.

WARREN A. GREENLAW.

Witnesses:

WALTER E. LOMBARD,

EDNA C. CLEVELAND.