

Aug. 30, 1932.

F. H. COLE

1,874,452

BOILER TUBE CLEANER

Filed Sept. 25, 1928

2 Sheets-Sheet 1

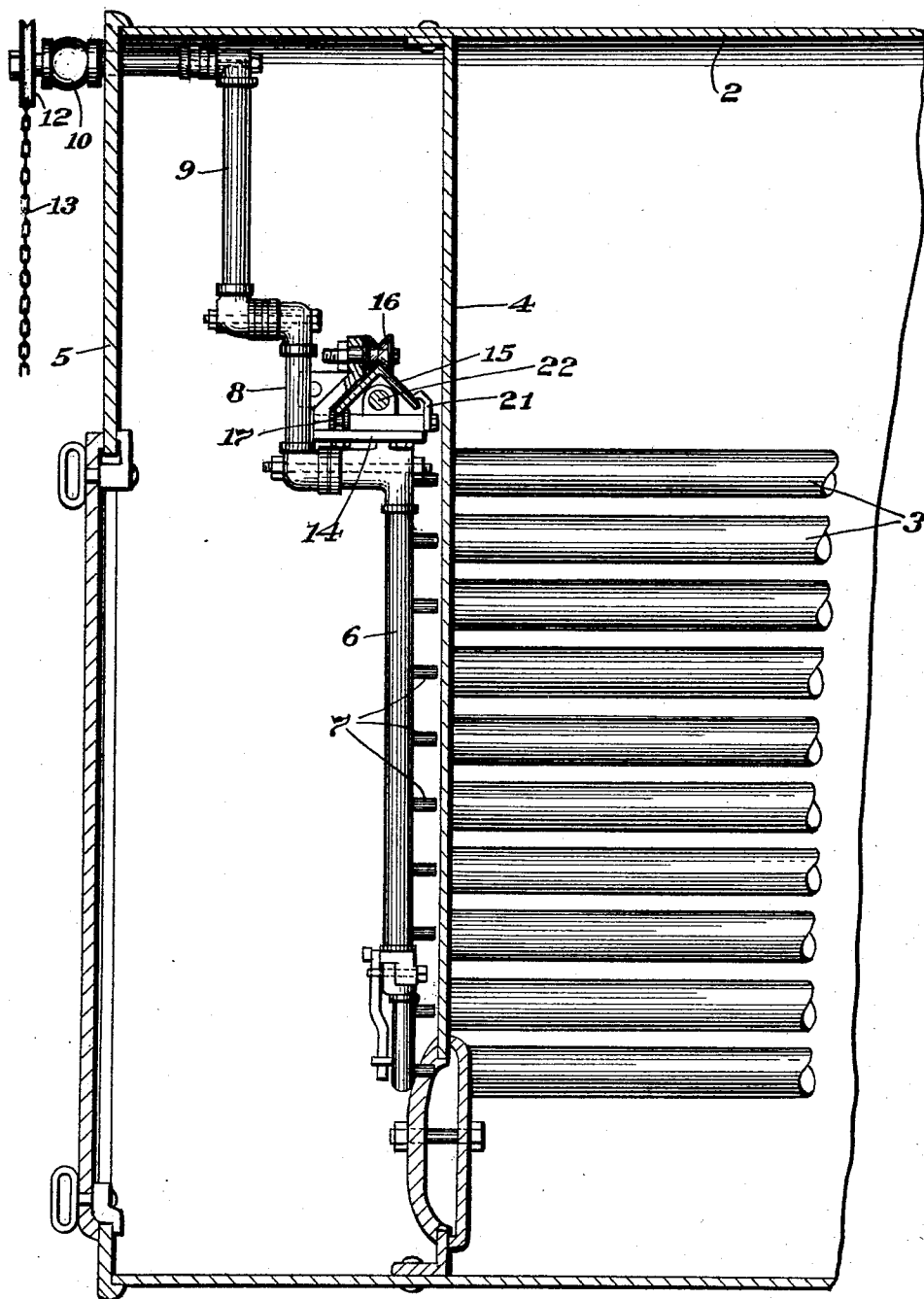


FIG. 1

INVENTOR
Frank H. Cole,
BY *John J. Connelley*,
ATTORNEY

Aug. 30, 1932.

F. H. COLE

1,874,452

BOILER TUBE CLEANER

Filed Sept. 25, 1928

2 Sheets-Sheet 2

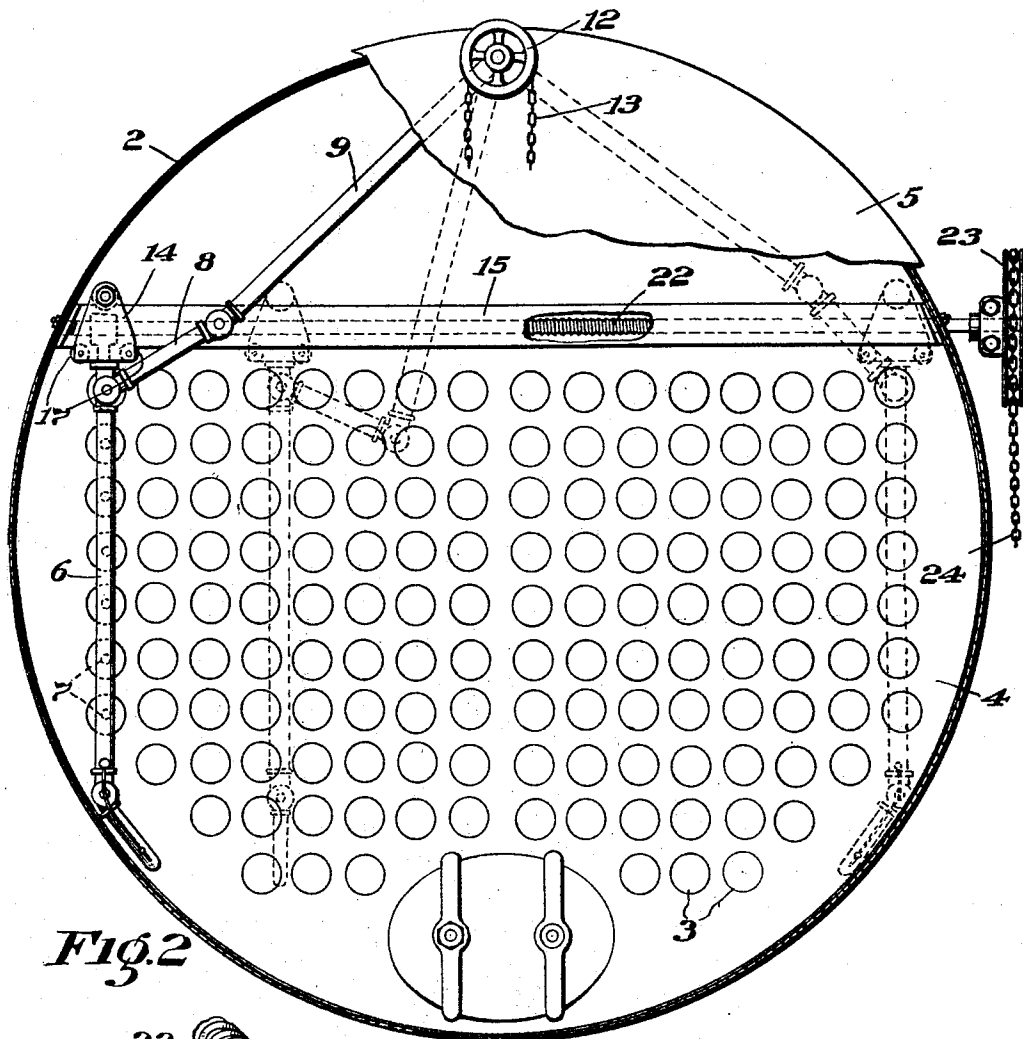


FIG. 2

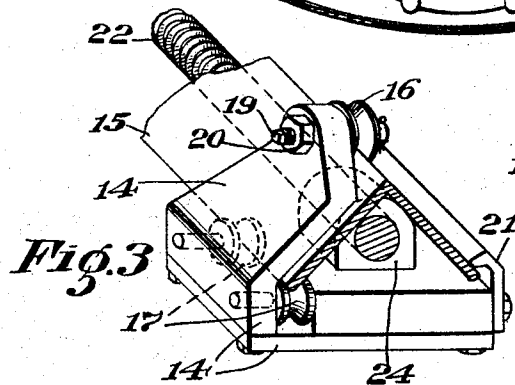


FIG. 3

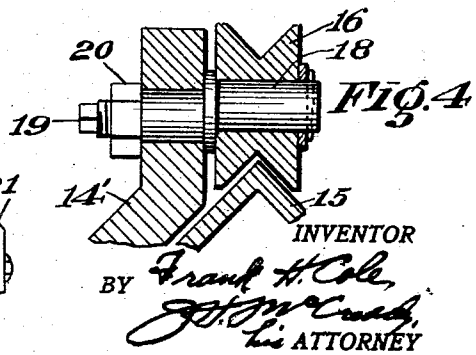


FIG. 4

INVENTOR
BY *Frank H. Cole*
John M. Connelley
his ATTORNEY

UNITED STATES PATENT OFFICE

FRANK H. COLE, OF WALPOLE, MASSACHUSETTS

BOILER TUBE CLEANER

Application filed September 25, 1928. Serial No. 308,300.

This invention relates to boiler tube cleaners and more especially to the general type of cleaners disclosed in my Patent No. 1,636,355, granted July 19, 1927.

Boiler tube cleaners of this character comprise a spray head or nozzle head provided with a series of nozzles designed to direct jets of steam, or other fluid under pressure, into the tubes and thus to blow the soot, ash and other foreign materials out of the tubes. This spray head is mounted on a track for traversing movement, and mechanism is provided for moving the head on the track to carry the jets across the ends of the entire series of tubes.

The present invention is especially concerned with the means for supporting and traversing the nozzle head, and it aims to provide a superior mechanism for this purpose.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings,

Figure 1 is a vertical sectional view of a portion of a boiler equipped with a tube cleaner embodying this invention;

Fig. 2 is a front elevation of the construction shown in Fig. 1, part of the smoke box being broken away;

Fig. 3 is a perspective view of the nozzle head carriage and adjacent parts; and

Fig. 4 is a sectional view illustrating the mounting of one of the rolls for the carriage.

The cleaner shown may be used in any form of fire tube boiler. The boiler illustrated includes a casing 2, tubes 3, tube sheet 4, and smoke box 5. The nozzle head is indicated at 6 and it carries a series of nozzles 7 which, as above stated, are designed to direct jets of steam into the tubes. Steam is supplied to the nozzle head through flexible connections 8 and 9 leading from a supply valve 10 which is located outside the boiler casing and is provided with a sprocket wheel 12 carrying a chain 13 by means of which the valve may be opened or closed from the floor. These parts are constructed and arranged in essentially

the same manner as in the cleaner shown in my prior patent above designated.

The nozzle head 6 is supported by a carriage 14 which is mounted to run on a horizontal track 15 supported rigidly in the smoke box. Preferably this track is of angular cross-section, as clearly shown in the drawings, and it is provided at its opposite ends with flanges which are bolted or riveted to the shell or casing 2 of the boiler. The carriage preferably is mounted on rolls and for this purpose is provided with an upper grooved roll 16 which runs on the ridge of the track 15, and with two additional grooved rolls 17-17 that engage the lower edge of the track. These rolls cooperate to grip the track, as will be obvious from an inspection of Fig. 3, and in order to adjust their clearance so that they may run freely while still exerting the proper grip on the track, the upper roll is mounted on an eccentric stud 18. Referring to Fig. 4 it will be observed that this stud is clamped in the angular portion 14' of the carriage by a nut 20, and is provided with a square end 19 which facilitates adjustment of the stud to move the roll 16 toward or from the track 15. In Fig. 4 the roll is shown spaced slightly from the track for purposes of clearness.

When the cleaner is in operation there is some back pressure due to the discharge of the steam through the nozzle 7, and this back pressure tends to swing the lower end of the nozzle head away from the ends of the tubes. Any such tendency, however, is effectually resisted by the angular piece 21, Figs. 1 and 3, which is bolted or riveted to the carriage 14 and engages the upper inclined surface of the right-hand slope of the track 15, as clearly shown in the drawings.

The traversing movement of the nozzle head preferably is produced by a screw threaded mechanism. For this purpose a horizontal screw threaded shaft 22 is mounted immediately below the track 15 and within the angle of the track, and one end of the shaft is extended through the boiler casing and equipped with a sprocket wheel 23 engaged by a chain 24 which extends to within a convenient height from the floor so that it

can be operated to rotate the shaft. The carriage 14 is provided with a nut or traveller 24 which is internally screw threaded to engage the threads of the shaft 22. This nut is rigidly mounted in the carriage which supports the nozzle head 6, so that when the shaft is revolved the nut and carriage are moved longitudinally of the shaft in one direction or the other, depending upon the direction of rotation of the shaft.

In using the apparatus the workman opens the valve 10 by pulling on the chain 13 and thus revolving the wheel 12 in the proper direction to admit steam to the nozzle head 6 and nozzles 7. Then by pulling on the chain 24 he revolves the shaft 22 and thus traverses the nozzles across the ends of the tubes 3. This operation is continued until the tubes have been cleaned to the desired degree, at which time the valve 10 is closed.

It will thus be evident that the invention provides a relatively simple construction of boiler tube cleaner which can be manufactured and installed economically and is very convenient to operate. The angular construction of track is of advantage in shedding the soot, ash, and the like which, of course, travel through the smoke box in considerable quantities, and this track also effectually protects the threads of the shaft 22 from falling soot, and the like. Both the track and the traversing mechanism therefore are maintained free of any accumulations of these materials which would seriously interfere with the operation of the apparatus.

While I have herein shown and described a preferred embodiment of my invention, it will be understood that the invention may be embodied in other forms without departing from the spirit or scope thereof.

Having thus described my invention, what I desire to claim as new is:

1. In a boiler tube cleaner, the combination of a nozzle head, means for conducting steam to said head, a carriage supporting said head, a track on which said carriage is mounted, and means for traversing said carriage on said track, said track forming a guard for a part of said traversing means.

2. In a boiler tube cleaner, the combination of a nozzle head, means for conducting steam to said head, a carriage supporting said head, a track on which said carriage is mounted, said carriage having wheels mounted to grip the track, means whereby said wheels may be relatively adjusted to vary their clearance on the track, and means for traversing said carriage on said track.

3. In a boiler tube cleaner, the combination of a nozzle head, means for conducting steam to said head, a carriage supporting said head, a screw threaded shaft mounted in said boiler and in operative engagement with said carriage, a guard for said shaft forming a track on which said carriage is mounted,

and means operable to rotate said shaft and thereby to traverse said head on said track.

4. In a boiler tube cleaner, the combination of a nozzle head, means for conducting steam to said head, a carriage supporting said head, a screw threaded shaft mounted in said boiler and in operative engagement with said carriage, a guard of angular cross-section rigidly supported in said boiler in position to protect said shaft from soot and the like, said guard forming a track on which said carriage is supported for traversing movement, and means operable to rotate said shaft and thereby to traverse said head on said track.

5. In a boiler tube cleaner, the combination of a nozzle head, nozzles carried thereby, means for conducting steam to said head, a carriage supporting said head, a screw threaded shaft with which said carriage is operatively engaged, means supporting said shaft in a horizontal position, said shaft extending approximately parallel to the plane of the ends of the boiler tubes, means operable to rotate said shaft and thereby to traverse said head to move said nozzles across the ends of the boiler tubes, and a guard for said shaft serving also to guide carriage during its traversing movement.

FRANK H. COLE.