

(No Model.)

W. F. BRADBURY.
TUBE CLEANER.

No. 507,965.

Patented Oct. 31, 1893.

Fig. I.

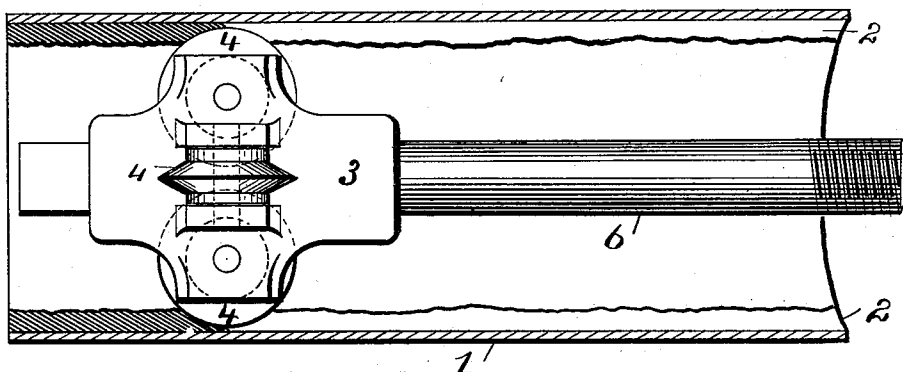


Fig. II.

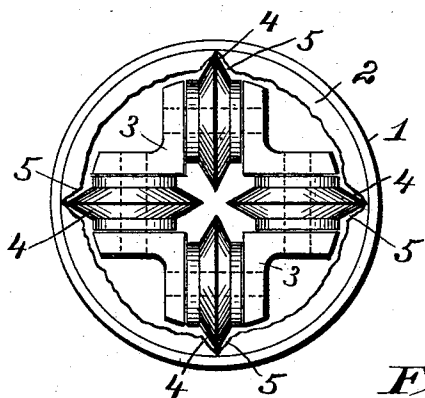


Fig. III.

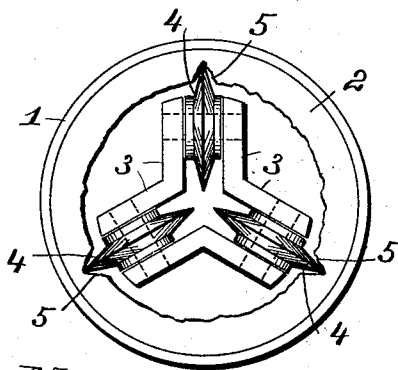


Fig. IV.

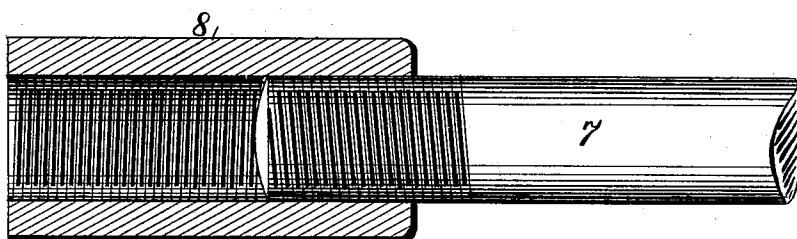
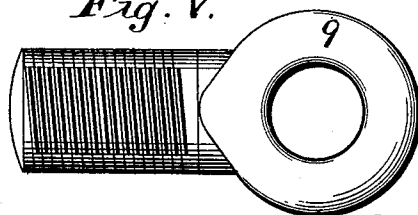


Fig. V.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM F. BRADBURY, OF KANSAS CITY, KANSAS.

TUBE-CLEANER.

SPECIFICATION forming part of Letters Patent No. 507,965, dated October 31, 1893.

Application filed March 11, 1893. Serial No. 465,540. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BRADBURY, of Kansas City, in the county of Wyandotte and State of Kansas, have invented certain
5 new and useful Improvements in Tube-Cleaners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

10 My invention relates to certain new and useful improvements for cleaning the tubes of boilers, intended more especially for use in water tube boilers, but which may be used for cleaning tubes and flues of any descrip-
15 tion in which scale or soot is formed therein; and my invention consists of a tube cleaner comprising a rigid head and suitable cutting rollers journaled therein.

In the accompanying drawings: Figure I, 20 represents a longitudinal section of a tube showing scale formed therein, and my improved device within the tube whereby the scale is cut and removed from the same. Fig. II, represents a transverse view of the tube
25 and an end view of the cleaner. Fig. III, represents a slight modification of the tube cleaner in which three rollers are used instead of four, this form being preferable where the scale is very heavy. Fig. IV, is an enlarged
30 detail view of the rod for operating the cleaner and a sleeve coupling for connecting said rod with the cleaner head. Fig. V, is an enlarged view of an eye bolt which may be coupled
35 into the sleeve where it is desired to use a chain or cable for cleaning the flues in place of the rod, as shown in Fig. IV.

Referring to the drawings: 1, represents a flue; 2, the scale formed therein, and 3, represents a rigid head to which a series of rollers 4, is journaled. There may be any number of rollers desired, according to the thickness of the scale formed within the tube. Where the scale is not heavy, I use the four cutting rollers, as shown in Fig. II; but where
40 the scale is thicker, as shown in Fig. III, three cutting rollers may be used as there would be less resistance with three than with four, and the diameter of the rollers, as shown in Fig. III, may be less than that shown in Fig. II,
50 so that a portion of the groove 5, cut in the scale may be formed with one cleaner, and then a cleaner used with cutting rollers of

greater diameter traveling in the same groove cutting the rest of the way through the scale. In an ordinary thickness of scale, as shown 55 in Fig. II, one passage of the cleaner through the tube will cut away the scale, it only being necessary to use a cleaner with rollers of a diameter that will cut to the outside of the scale; but as said before, if desired different
60 sized cleaners may be used to first cut away a portion of the scale, forming a portion of the groove, and then completing the cutting by using a cleaner having rollers of greater diameter. The rollers 4, are beveled on each
65 side to the center thus forming a V shaped notch 5, in the scale when the cleaner has been forced through the tube. This destroys the arch formed by the scale within the tube, and allows the segments of scale to drop down
70 and be washed out of the tube. The cutting rollers being wedge shaped, in addition to cutting out the V shaped notch in the scale, press laterally against the scale and thus
75 loosen it in its connection with the tube, so that when the instrument is withdrawn the arch of the scale being destroyed the scale will readily drop from its position as formed within the tube. To the head 3, is secured a
80 short screw threaded rod 6, to which may be connected either a hand rod 7, by means of a threaded coupling 8, or an eye bolt 9, to which a chain or cable may be attached for the purpose of forcing the cleaner through the tube.

I am aware that it is not broadly new to 85 cut the scales from boiler tubes by means of V-shaped rollers, but I am not aware that the cutting rollers have ever before been journaled directly to a rigid head as in my improved device, so that they can be forced
90 through the incrustated tubes and each cutter will serve as a rigid abutment for the others and hold them firmly to their work.

I claim as my invention—

In a tube cleaner, the combination of a rigid 95 head, with cutting rollers unyieldingly journaled therein and each adapted to serve as a rigid abutment for the others while removing scale from a tube, substantially as set forth.

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Witnesses:

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F. E. MULLETT.