

(No Model.)

A. SECOR.
STEAM BOILER TUBE CLEANER.

No. 555,976.

Patented Mar. 10, 1896.

FIG. 1.

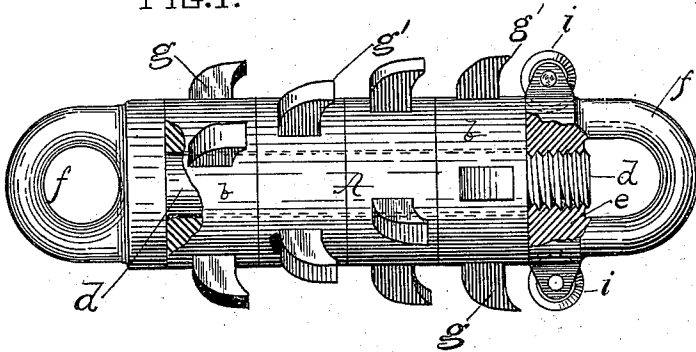


FIG. 2.

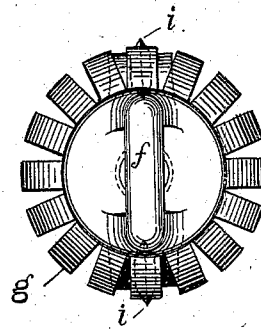


FIG. 4.

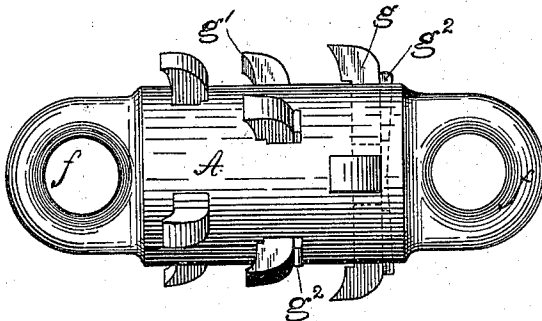


FIG. 3.

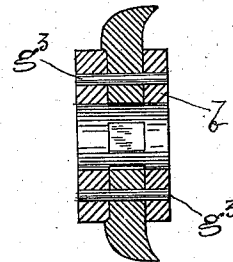


FIG. 5.

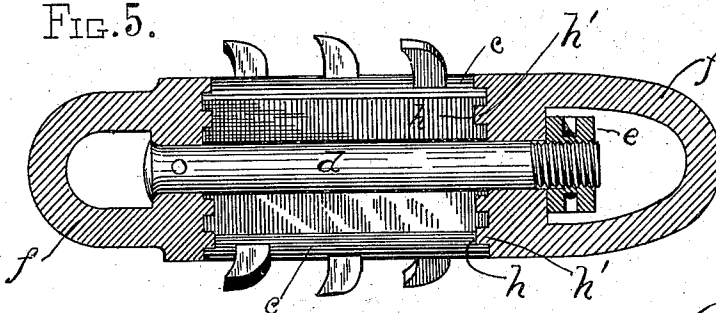
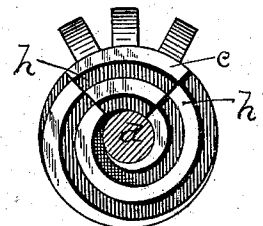


FIG. 6.



WITNESSES;

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ALBERT SECOR, OF TOLEDO, OHIO.

STEAM-BOILER-TUBE CLEANER.

SPECIFICATION forming part of Letters Patent No. 555,976, dated March 10, 1896.

Application filed February 4, 1895. Serial No. 537,183. (No model.)

To all whom it may concern:

Be it known that I, ALBERT SECOR, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have
5 invented certain new and useful Improvements in Boiler-Tube Cleaners, of which the following is a specification.

In tubular boilers in which the water is heated within the interior of the tubes great
10 difficulty has heretofore been encountered in removing incrustations from the inner surface of the tubes, owing to the difficulty of reaching their interior, especially at the points where the tubes are bent or curved.

15 My invention relates to and its object is to provide a simple, cheap and efficient means for removing the incrustations from the interior of boiler-tubes and for overcoming the difficulties above pointed out. I attain these
20 results by means of the device hereinafter described, and shown and illustrated in the accompanying drawings, made part hereof, in which—

Figure 1 is a side elevation of my device;
25 Fig. 2, an end elevation of the same; Fig. 3, a sectional view of one of the sections of my device, showing means for securing in place the teeth hereinafter referred to; Fig. 4, a
30 side elevation showing a modification of my device, and the method of securing the teeth hereinafter referred to; Fig. 5, a central longitudinal sectional view of a modification of my device and means of expanding and contracting the body of my device, hereinafter
35 referred to; and Fig. 6 illustrates the threaded meeting faces hereinafter referred to, whereby the contraction and expansion of the body of my device are attained.

40 Like letters represent like parts throughout the several views.

In the drawings, A represents the barrel of my tube-cleaner, preferably cylindrical in form. This barrel may be made solid, as in
45 Fig. 4, or divided into cross-sections *b*, as in Figs. 1 and 3, or in longitudinal segmental sections *c*, as shown in Figs. 5 and 6. When the barrel is thus made up in sections, the parts are held together by a bolt *d* and nut
50 *e*, the bolt passing axially through the center of the sectional barrel, as shown in Figs. 1 and 5.

f f are loops or eyes at either end of the

barrel above referred to, formed either integrally therewith or being held in place by
55 bolt *d* and nut *e*, as in Figs. 1 and 5.

Projecting radially from the barrel A are
60 teeth *g g*, having outer extremities curved forward in the direction of the length of the barrel A, forming projecting cutting-edges *g'*. In practice I prefer to arrange the teeth
65 spirally to the axis of the barrel A, as illustrated in Figs. 1 and 4. These teeth may be swaged or cast in place, or may be set in a socket formed for that purpose and wedged
70 in place by wedges *g''*, as shown in Fig. 4, or may be secured in position by means of pins
75 *g'''*, passing longitudinally through the barrel A and at a right angle through the shank of the teeth, as shown in Fig. 3.

The method of securing the teeth in position (shown in Fig. 4) by means of wedges *g''*
80 permits the radial adjustment of the teeth so that their wear may be taken up and so that the diameter of the device may be changed to conform to variations in the diameter of
85 the boiler-tubes. This result may also be attained by means of the modification shown in Figs. 5 and 6. In this example of my invention the end faces of the barrel are provided
90 with convolute grooves, as at *h*, and the adjoining faces of the looped end pieces are provided with corresponding convolute threads, as at *h'*, fitting into the grooves *h*. The parts
95 are held against separation lengthwise by bolt *d* and nut *e*. The nut *e* being loosened the turning of the barrel or the end pieces will, through the convolutions *h h'*, cause the
sectors *c* composing the barrel, together with their teeth, to spread apart or contract, as the case may be. If desired, radial cutting-
100 disks *i* may be journaled upon the barrel forward of the teeth, the office of these disks being to slice the tubular incrustations longitudinally preparatory to their being broken up by the teeth which follow the cutting-disks.

The operation of my device is as follows: To each of the links *f* is secured a chain or rope, preferably a chain. The chain attached to the forward loop or eye is drawn
105 through the tube to be cleaned, and by means of this rope or chain the instrument above described is drawn through the tube by a series of strong forward jerks upon the pulling-chain, accompanied by a backward and for-

ward motion accomplished by means of both the ropes or chains, the teeth as they proceed loosening, cutting, and breaking the incrustations. The shortness of the barrel of my device permits it to accommodate itself to the curves and bends of the tubes without lodgment.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A boiler-tube cleaner, comprising a barrel, an eye or loop at each end of said barrel, and radially-projecting teeth having wedge-like cutting-edges projecting forwardly beyond the base of the teeth in the direction of the length of the barrel, substantially as and for the purpose specified.

2. In a boiler-tube cleaner, the barrel, a loop or eye at each end thereof and radially-projecting cutting-teeth, in combination with

means for the radial adjustment of said teeth, substantially as and for the purpose specified.

3. In a boiler-tube cleaner, the barrel thereof having at each end an eye or loop, radial cutting-teeth upon said barrel, and radial cutting-disks upon said barrel, in combination with means for the radial adjustment of said cutting mechanisms, substantially as and for the purpose specified.

4. In a boiler-tube cleaner, the barrel thereof, having at each end an eye or loop and radially-projecting cutting-teeth, in combination with means for the radial adjustment of said teeth, and the cutting-disks, substantially as and for the purpose specified.

ALBERT SECOR.

In presence of—

I. N. HUNTSBERGER,
L. E. BROWN.