(No Model.)

W. B. & J. R. SMITH.

BOILER TUBE CLEANER.

No. 486,133. Patented Nov. 15, 1892.

Fig. 1.

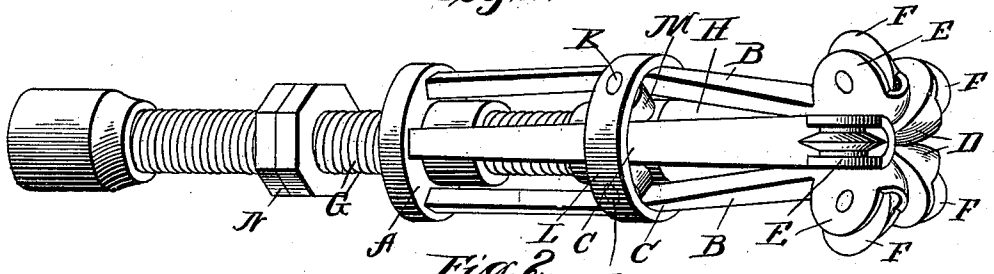


Fig. 2.

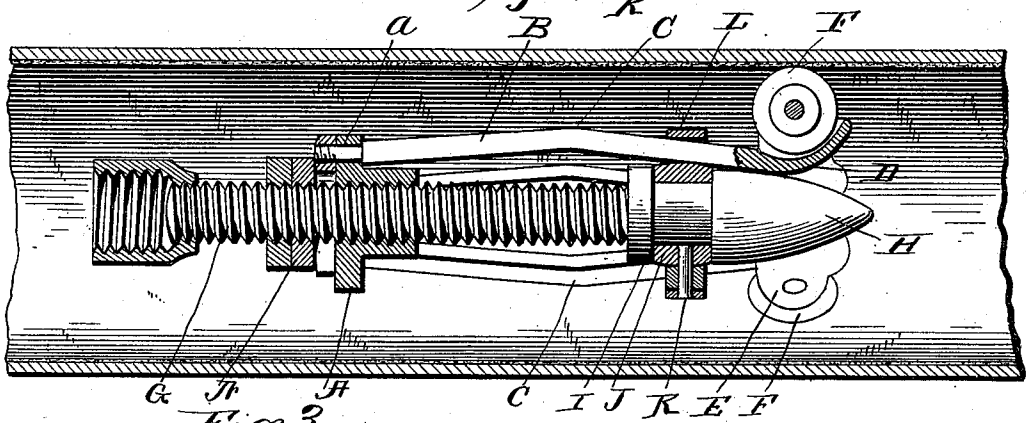


Fig. 3.

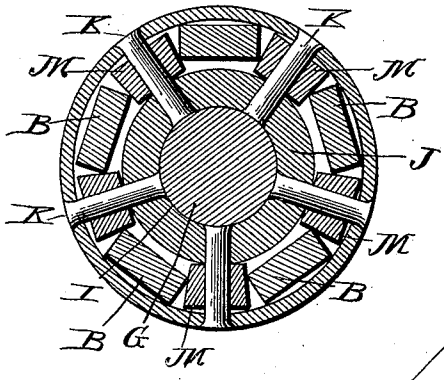
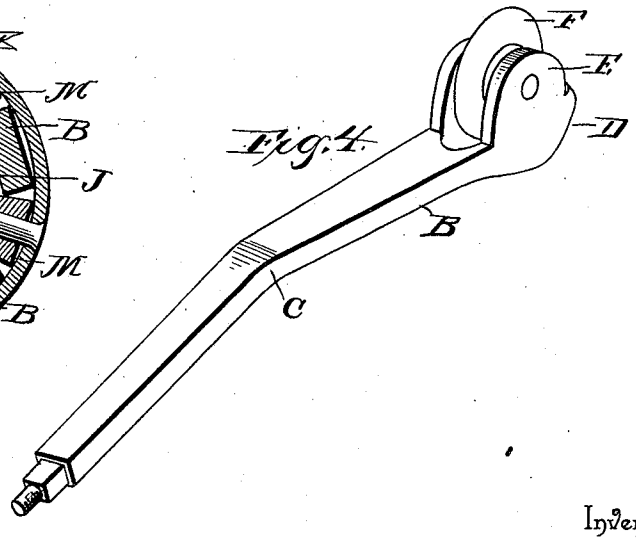


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM B. SMITH AND JAMES R. SMITH, OF BIRMINGHAM, ALABAMA, ASSIGNORS OF ONE-HALF TO A. EUBANK, OF SAME PLACE.

BOILER-TUBE CLEANER.

SPECIFICATION forming part of Letters Patent No. 486,133, dated November 15, 1892.

Application filed June 27, 1892. Serial No. 438,191. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM B. SMITH and JAMES R. SMITH, citizens of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented a new and useful Boiler-Tube Cleaner, of which the following is a specification.

This invention relates to tube-cleaners for steam-boilers; and it has for its object to provide an improved device of this character which is designed to cut up and loosen the scaly incrustations which form within the water-tubes of the boiler, simply and effectively, and a device which not only insures accuracy in its work, but one which may be easily adjusted to adapt itself to any size of tube or flue, as the case may be.

To this end it is the main object of the present invention to generally improve upon similar devices.

With these and many other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a boiler-tube cleaner constructed in accordance with this invention. Fig. 2 is a longitudinal sectional view of the same within a portion of a tube, showing the scaly incrustations therein. Fig. 3 is a vertical transverse sectional view through the adjusting-ring. Fig. 4 is a detail in perspective of one of the cutter-levers.

Referring to the accompanying drawings, A represents a flanged nut, having a series of holes *a* in the flange thereof and which receive the inner ends of the series of cutter-levers B. The said cutter-levers B are loosely secured within the slots in said flanged nut, so as to allow the same to be readily expanded and collapsed, and said levers are bowed centrally, as at C, and are provided at the extremities of their other ends with the inner beveled meeting faces D, which, when all of said levers are collapsed, meet the corresponding beveled faces of the adjacent lever ends, and thereby allow the levers to be collapsed to a comparatively-small compass to allow for insertion in a small flue. The said levers are also provided at the cutting ends thereof with the outer bifurcated lugs E, within which are mounted the sharpened cutting-disks F, which, when said levers are opened or expanded, are designed to cut up and loosen the scale in the flue within which the cleaner is inserted and reciprocated. A screw-mandrel G works through the flanged nut A and terminates at its inner end between the several cutters in a conical expanding or spreading head H, which, when the mandrel is screwed within the nut and between the said levers, spreads the outer ends of the levers and forces the cutters against and into the scale in the flue. Directly back of or at the base of said head upon the mandrel G is formed an annular groove I, within which works loosely the collar J, which is carried back and forth with the reciprocation of the mandrel to collapse or expand cutters. Connected with and carried by the collar J by the bolts K is the adjusting-ring L, which encircles the bowed levers and slides back and forth over the same as the mandrel is adjusted. The levers B work between the regularly-spaced bolts K, and undue friction thereon is prevented by the spacing-sleeves M, loosely mounted upon said bolts K. Now it will be readily seen that when the screw-mandrel G is screwed into the nut A until the conical head thereof has forced itself between the outer ends of the cutter-levers and spread and expanded the same the adjusting-ring L will be near the outer ends of said levers and on account of the central bow of the same will allow for said spreading; but, on the other hand, when by manipulating the screw-mandrel the conical head thereof recedes from the outer ends of the levers within the same at the same time the adjusting-ring L is carried by the mandrel over the bowed portion of the levers, and upon reaching the summit of said bowed portion the said levers are entirely collapsed. By this adjustment the cleaner can be adapted to any size of flue or tube.

In order to secure the nut A in any adjusted position according to its use in different-sized tubes and different thicknesses of scales, set-nuts N are mounted upon the screw-mandrel adjacent to the nut A, through which the

same works. It is of course understood that by means of the ordinary couplings several sections may be connected to one end of the screw-mandrel for manipulating the same in the flues.

It is thought that the construction and operation and many advantages of the herein-described tube-cleaner are now apparent without further description.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a tube-cleaner, a flanged interiorly-threaded nut having a series of holes or apertures in the flange thereof, a series of curved or bowed levers loosely bolted at one end in said holes or apertures and provided at their outer ends with registering beveled meeting faces and movable cutting-disks, and a headed screw-mandrel working through said nut between the levers and connected with the latter, substantially as set forth.

2. In a tube-cleaner, the combination, with a threaded nut or head, of a series of bowed cutter-levers connected to said nut and provided at their outer ends with inner beveled meeting faces and outer bifurcated lugs, cutting-disks mounted in said lugs, a screw-mandrel working through said head or nut and terminating at one end in a conical head working between the meeting ends of said levers, and an adjusting-ring carried by said mandrel and embracing said bowed levers, substantially as set forth.

3. In a tube-cleaner, a flanged nut, a series of bowed levers loosely connected at one end to said nut, cutting-disks mounted in the other ends of said levers, a screw-mandrel passing through said nut and provided with a conical spreading head and an annular groove at the base of said head, a collar loosely working in said groove, and an adjusting-ring spaced from said collar and encircling said bowed levers, substantially as set forth.

4. In a tube-cleaner, a flanged nut, a series of bowed levers loosely connected at one end to said nut and carrying cutting-disks at the other ends, a screw-mandrel passing through said nut and provided with a conical head and an annular groove, a collar loosely working in said groove, an adjusting-ring encircling said bowed levers and connected with said collar by regularly-spaced bolts between which work said levers, and sleeves loosely mounted upon said bolts, substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

WILLIAM B. SMITH.
JAMES R. SMITH.

Witnesses as to the signature of William B. Smith:

J. S. KENNEDY,
C. W. HICKMAN.

Witnesses as to the signature of James R. Smith:

T. B. SELMAN,
M. H. MCKINNEY.