

942,778.

Fig. 1.

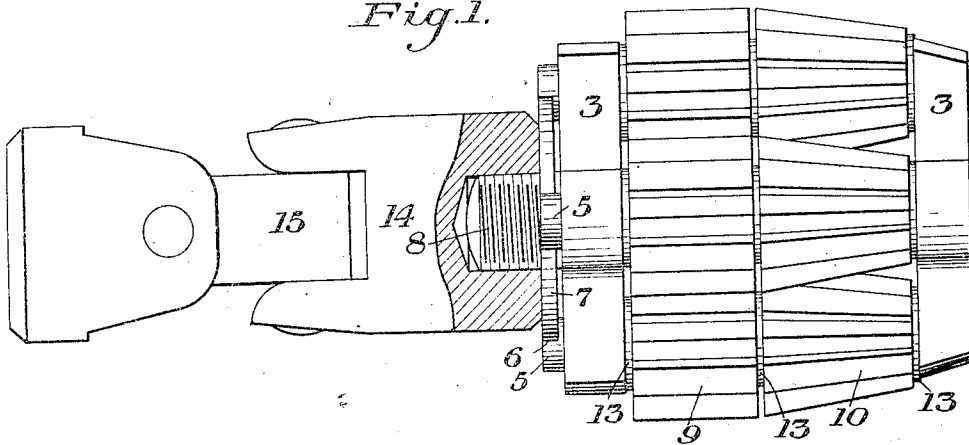


Fig. 2.

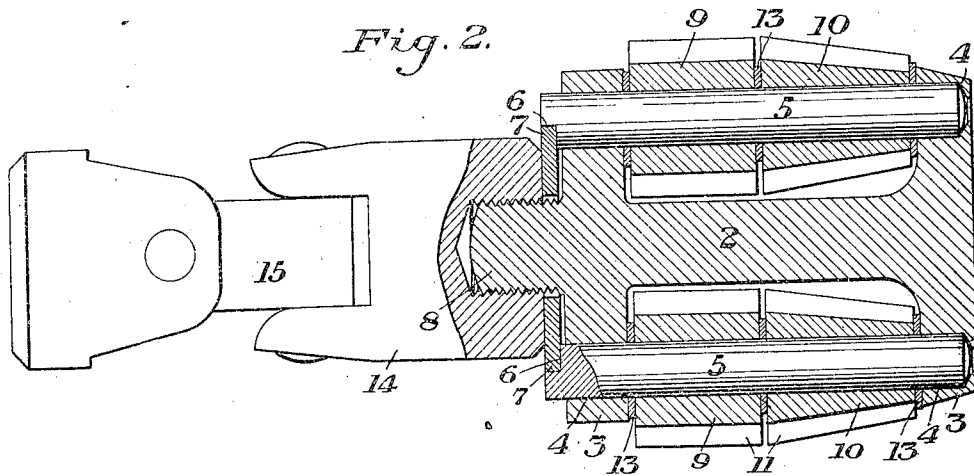
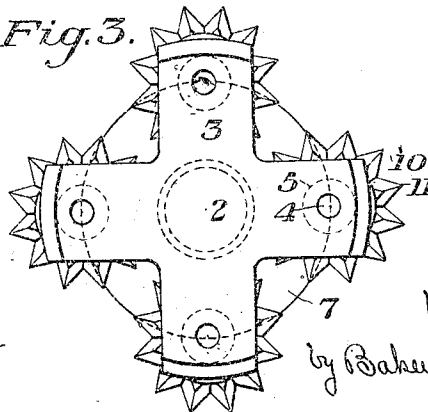


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

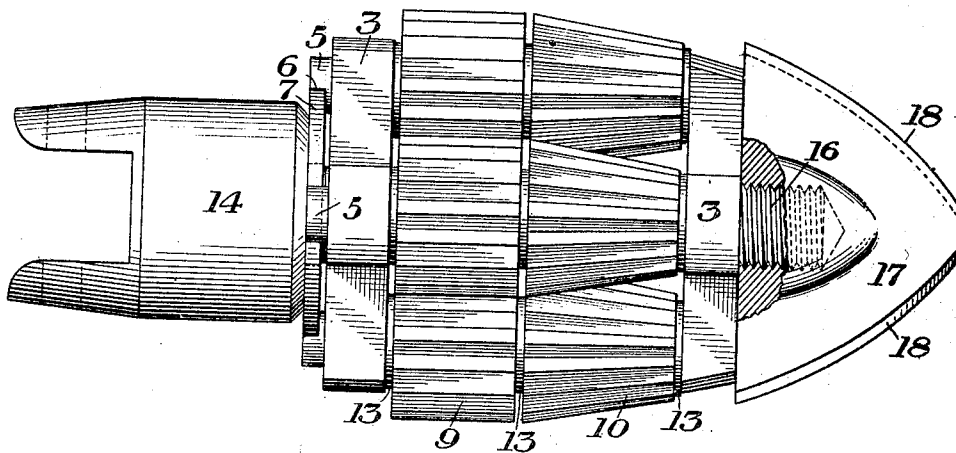
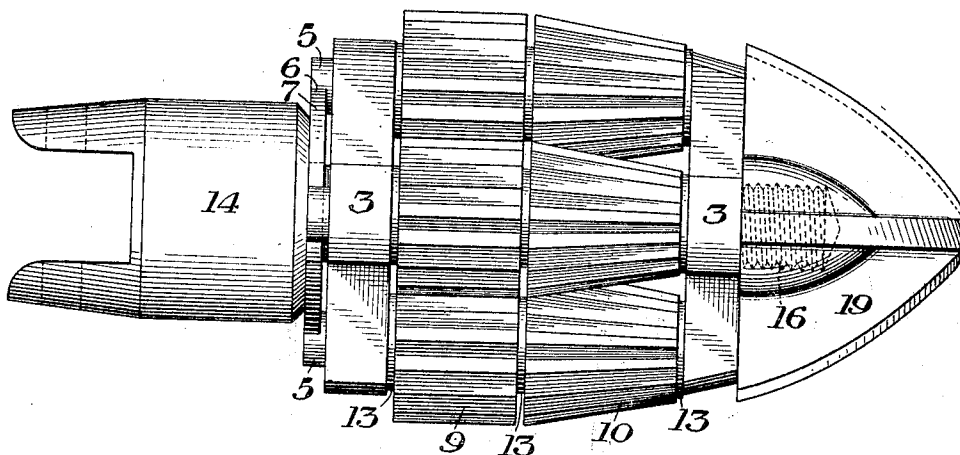


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM S. ELLIOTT, OF PITTSBURG, PENNSYLVANIA.

BOILER-TUBE CLEANER.

942,778.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed March 11, 1909. Serial No. 482,658.

To all whom it may concern:

Be it known that I, WILLIAM S. ELLIOTT, of Pittsburg, Allegheny county, Pennsylvania, have invented a new and useful Boiler-Tube Cleaner, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a side view, partly broken away, of a boiler-tube cleaner embodying my invention; Fig. 2 is a view, partly in side elevation, and partly in section, of the same; Fig. 3 is an end view, and Figs. 4 and 5 are views similar to Fig. 1, but showing modifications.

My invention has relation to the class of boiler-tube cleaners, and is designed to provide a simple and efficient tool of this character, by means of which scale and other deposits of a hard nature on the interiors of boiler-tubes may be rapidly and thoroughly removed.

A further object of the invention is to provide a tool of this character, in which the parts, and especially the cutting elements, can be readily removed and replaced when necessary.

The nature of my invention will be best understood by reference to the accompanying drawing, which will now be described; it being premised, however, that various changes may be made in the details of construction and arrangement of the several parts without departing from the spirit and scope of the invention as defined in the appended claims.

In the drawings, the numeral 2 designates the body portion of the head of the cleaning-tool, having at each end portion radial arms 3, provided each with a circular opening or seat 4 for a cutter-carrying pin or spindle 5. These spindles or pins are preferably inserted from the rear of the head, the front seats 4 therefor being closed at their forward ends to secure the spindles or pins against forward endwise movement. The rear end of each spindle or pin is cut away or shouldered, as indicated at 6, for the engagement therewith of a retaining ring 7, which is threaded or otherwise secured upon the threaded shank 8. This retaining ring engages the entire series of spindles or pins and effectively retains them against rearward movement in the head.

Loosely journaled upon each spindle or pin 5 to freely rotate thereon, are two

toothed cutter-wheels 9 and 10. These wheels are provided with longitudinally-extended cutting teeth which are preferably tapered on the wheels 10. A spacer or washer 13 is preferably interposed between the adjacent ends of each pair of cutters 9 and 10, and similar washers are also preferably employed between the ends of the cutters and the inner faces of the arms 3.

The cutter-head is connected to a suitable driving shaft by means of the arm 14 which is threaded upon the shank 8, and by the universal joint 15, which permits of a free oscillating or gyratory movement of the cleaning tool within the tube to be cleaned. This universal joint may be of any usual or well known character.

In operation, the tool is inserted into the tube to be cleaned, and is rotated therein at a high rate of speed. By reason of the universal joint 15, the head can adapt itself to inequalities of surface within the tube. The cutters 9, 10, being free to rotate upon the spindles or pins 5, in addition to their rotary movement with the head, attack the scale in a very effective manner. The tapered form of the front cutters 10 enables them to cut their way into the scale, and thereby facilitates the introduction of the tool into the tubes, and also its passage therethrough.

In the modification shown in Fig. 4, the forward end of the head is provided with a threaded stud or projection 16, or other means for securing a drill blade 17. This drill blade is provided with the two opposite radially extending beveled cutting edges 18, and is tapered toward its forward end. This form of tool is especially adapted for use in tubes having a thick deposit of scale, the drill acting as an advance cutter whereby the tool may be introduced into a tube in which the scale is so thick as to leave but a relatively small opening, and also greatly facilitates the work of the cutters 9 and 10, which follow the drill.

The modification shown in Fig. 5 is similar to that shown in Fig. 4, except that the drill 19 is provided with four radially arranged cutting blades or wings, instead of two. It will be obvious that the drill may be provided with any desired number of these blades and cutting edges.

By unscrewing the head from the arm 14, the retaining ring 7 can be readily removed, thus permitting the removal of any one or all of the spindles or pins 5. This permits

any broken or injured cutter to be readily removed and replaced. The advance drills, when used, can also readily be removed and sharpened, or replaced by new ones, if necessary.

While I have shown the head as provided with four pins or spindles 5, with one pair of cutters upon each spindle, it is obvious that any desired number of the spindles may be provided, and that any number of cutter wheels may be mounted for free rotation upon each spindle. Various other changes may be made in the details of construction and arrangement of the parts without departing from the spirit and scope of my invention.

What I claim is:

1. A boiler tube cleaner, comprising a head having front and rear arms formed with openings therein, a plurality of pins or spindles seated in said openings, and having shouldered or recessed projecting rear end portions, and a retaining ring engaging the recesses of said end portions, and holding the pins against rearward movement, said ring being removable to permit the pins to be removed from said openings, and cutters loosely mounted on the pins or spindles between the said arms; substantially as described.

2. A boiler tube cleaner, comprising a

head having front and rear arms formed with openings therein, the openings in the forward arms being closed at their forward ends, a plurality of pins or spindles seated in said openings, and inserted from the rear of the head, said pins or spindles having their rear end portions projecting beyond the rear arms of the head, and formed with shoulders or recesses, and a removable retaining member engaging the shoulders or recesses of all the pins or spindles; substantially as described.

3. A boiler tube cleaner, comprising a head having front and rear arms formed with openings therein, a plurality of pins or spindles seated in said openings, and having shouldered or recessed projecting rear end portions, and a retaining ring engaging the recesses of said end portions, and holding the pins against rearward movement, said ring being removable to permit the pins to be removed from said openings, together with a drill secured to said head in advance of the cutters.

In testimony whereof, I have hereunto set my hand.

WILLIAM S. ELLIOTT.

Witnesses:

H. M. CORWIN,

GEO. H. PARMELEE.