

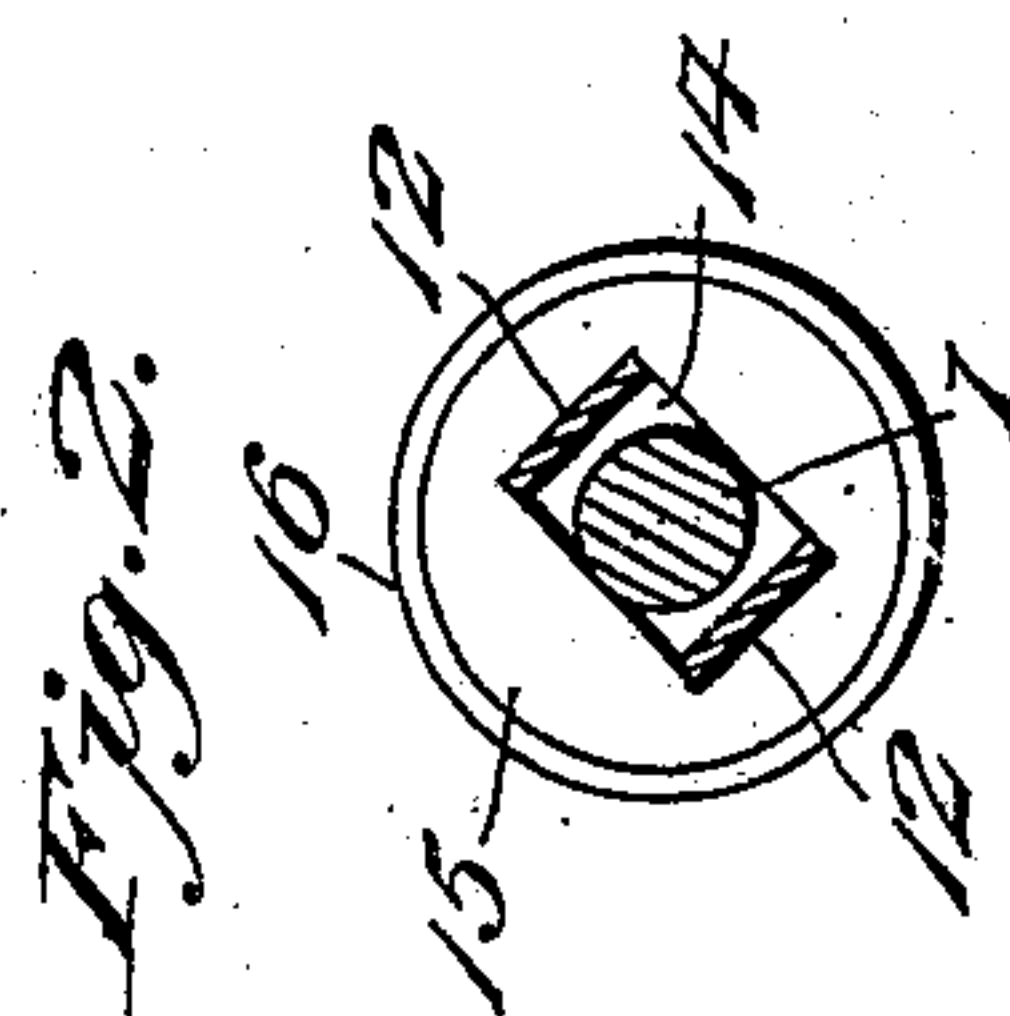
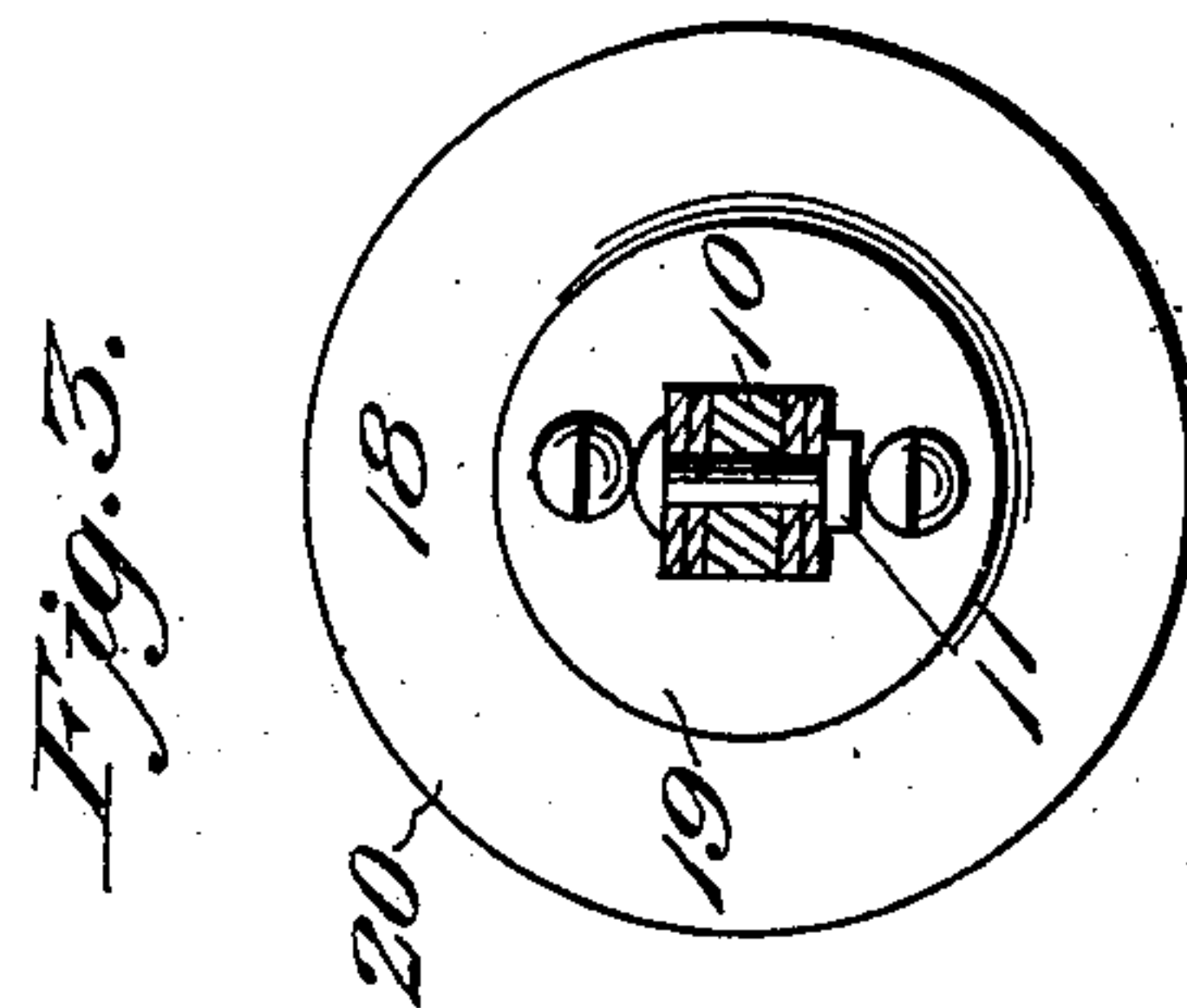
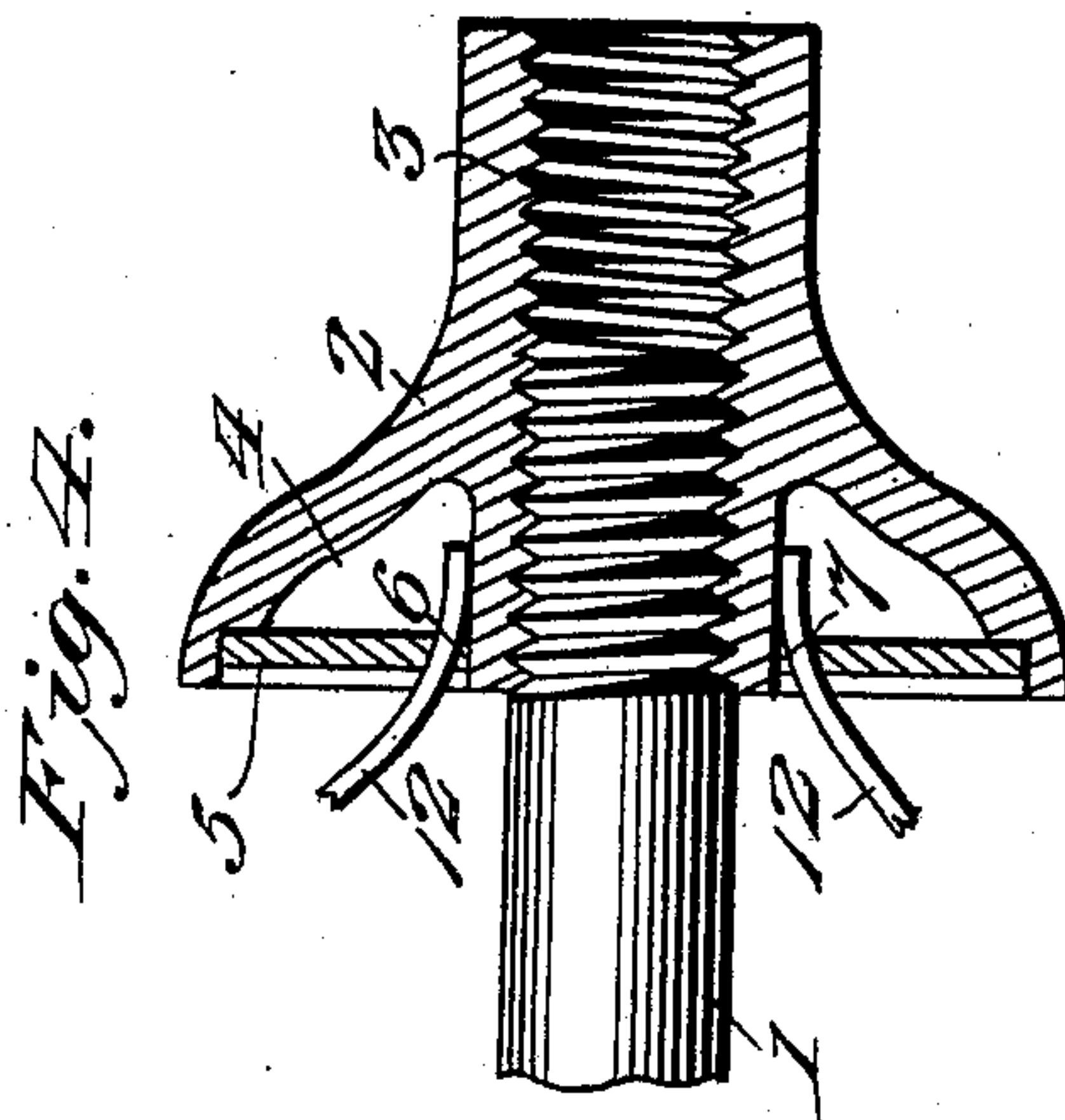
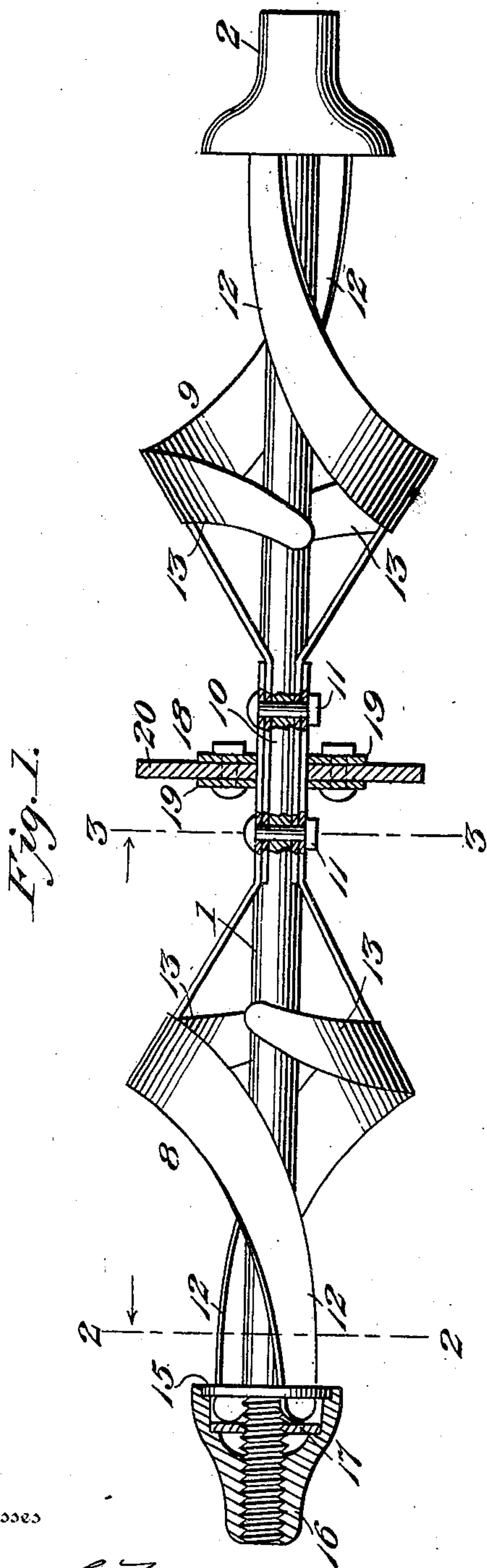
No. 754,854.

PATENTED MAR. 15, 1904.

E. T. DAVIS.  
TUBE CLEANER.

APPLICATION FILED MAY 7, 1903.

NO MODEL.



Witnesses

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# UNITED STATES PATENT OFFICE.

ELZA T. DAVIS, OF PENSACOLA, FLORIDA.

## TUBE-CLEANER.

SPECIFICATION forming part of Letters Patent No. 754,854, dated March 15, 1904.

Application filed May 7, 1903. Serial No. 156,083. (No model.)

*To all whom it may concern:*

Be it known that I, ELZA T. DAVIS, a citizen of the United States, residing at Pensacola, in the county of Escambia and State of Florida, have invented new and useful Improvements in Tube-Cleaners, of which the following is a specification.

This invention relates to cleaners for boilers or other tubes of that type having resilient scraping-blades capable of adjustment to regulate the contact-pressure of the blades against the tubes cleaned to thoroughly remove accumulations adhering to the interior of a tube and also to force out any deposits of soot resting within a flue.

The essential object of the invention is to provide a cleaner having detachably-secured blades coöperating with readily-controlled means for adjusting the blades and also adapting the latter to be quickly removed for dressing or sharpening purposes.

One of the main features of the present construction is that the cleaning-blades are so twisted and relatively arranged as to present only the cutting edges thereof in contact with the tube or flue walls. In conjunction with the blades a centrally-disposed scraper of disk-like form is employed to assist in pushing the deposits in a tube or flue forwardly toward the outlet thereof during the projection of the cleaner as an entirety through the tube or flue.

The invention consists in the construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of a cleaner embodying the features of the invention and showing one extremity thereof in section. Fig. 2 is a transverse vertical section on the line 2 2, Fig. 1. Fig. 3 is a transverse vertical section on the line 3 3, Fig. 1. Fig. 4 is a longitudinal vertical section of the connecting-head on one end of the cleaner.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

The numeral 1 designates a supporting or body rod for the cleaner, which has the opposite terminals screw-threaded, and on the rear end thereof is secured a combined nut and con-

necting-head 2, having a rear screw-threaded socket 3 for the attachment of operating-rods or handle-bars, adapted to be coupled up to the cleaner to project the same through any length of tube or flue. The front end of the head 2 is hollow, as clearly shown by Fig. 4, and formed with a front seat 4 to receive a retaining disk or washer 5, having a central opening 6 to fit over the part of the head which engages the rear screw-threaded terminal of the rod 1, and is also formed with opposite slots 7 for a purpose which will be presently explained.

On opposite sides of the center of rod 1 are secured double cleaners or cutters 8 and 9, which are similar in construction and are preferably formed from a single piece of sheet metal capable of being sharpened to a cutting edge. A pair of these cleaners or blades are arranged around the rod 1 at opposite sides of the center of the latter, said center being preferably square in cross-section and said blades having flattened shanks secured on the said squared center. The flat shanks of the cleaners or blades are overlapped and securely fastened in place by bolts and nuts 11, the bolts being removable to permit the blades to be detached for dressing or sharpening purposes or a substitution of any one of the same by another of like construction in the event of breakage. The cleaners or blades have a maximum projection outwardly from the rod 1 at a point between the secured shanks thereof and the opposite ends of the rod 1, and each blade comprises an elongated spiral member 12, continuing into a laterally-curved wing 13, the wings of each pair of contiguous blades being reversely positioned and the members 12 surrounding the rod 1 at opposite points. The rear cleaners or blades 9 have the free ends of the members 12 thereof inserted through the slot 7 of the disk or washer 5, and if the head-tube be moved forwardly over or retracted on the rod 1 the cleaners or cutters adjacent to said head will be correspondingly adjusted to increase or decrease their projection outwardly from said rod. The front cleaners or cutters 8 are constructed similar to those just described and have the parts designated by similar reference-numerals. The



front ends of the members 12 of the front cleaners or cutters are projected through a rectangular slot 14 in a washer 15, held on the front extremity of the rod 1 by a combined  
 5 nut and adjusting-cap 16, provided with a screw-threaded bore to operate in conjunction with the front screw-threaded extremity of the rod 1. The front screw-threaded extremity of rod 1 is considerably longer than the rear  
 10 screw-threaded extremity of rod 1 in view of the fact that it is desired to have the greatest range of adjustment effected in the front cleaners or blades as they leave the rear cleaners or blades in the operation of removing  
 15 the accumulations or soot from the tube or flue. The degree of adjustment of the rear cleaners or blades will be very small as compared to the adjustment of the forward cleaners or blades, and within the cap 6 in advance of  
 20 the washer 15 a stop-disk 17 is disposed, against which the free ends of the members 12 of the forward cleaners or cutters normally bear, particularly when the said cap is moved rearwardly over the rod 1 to increase the outward  
 25 projection of the members 12, engaging said cap relatively to the rod.

To assist in removing the loosened accumulations and soot deposited in tubes or flues, a scraping disk or pusher 18 is loosely disposed  
 30 on the square central portion of the rod between the bolts and nuts 11, the said scraping disk or pusher comprising a rigid body consisting of metallic disks 19, securely bolted or riveted to each other and holding a flexible  
 35 disk 20 between the same. This flexible disk 20 may be formed of any suitable material—such as rubber, rubber compound, or leather—and when worn said disk 20 may be removed and replaced by another of a similar nature.  
 40 The scraping disk or pusher 18 has a diameter equal to that of the maximum projection of the front and rear pair of blades relatively to the rod 1, or so that the periphery of disk 20 will closely engage the wall of the tube or  
 45 flue cleaned and thoroughly remove the soot and loosened accumulations.

All of the parts of the improved cleaner will be constructed of metal to render them durable, except the disk 20, and it is possible to  
 50 utilize a metallic disk of flexible nature in place of one of leather, rubber, or other analogous material.

In the operation of the device the cleaners or cutters are adjusted to cause them to firmly  
 55 engage with the wall of the flue or tube cleaned, and an operating or handle bar of suitable length or a number of said bars are coupled up to the head 2. The cleaner is then forced in through the tube or flue, and in view of the

spiral formation of the blades thereof every 60 part of the wall of the tube or flue will be engaged. To render the cleaner more effective, a rotary movement may be imparted thereto, and thus bring the edges of the blade with a more positive cutting effect against the wall 65 of the tube or flue. It will be seen that the ends of the blade are fully protected by the cap 16 and head 2, and are thereby prevented from becoming jammed or broken. Moreover, by using two sets of cutters or cleaners 70 the device will be caused to operate to remove accumulations or soot within a tube or flue when projecting forwardly as well as when drawn rearwardly, and by repeatedly reciprocating the cleaner forwardly and backwardly 75 within a tube or flue the latter becomes thoroughly relieved of any accumulation that may settle or collect therein.

To adapt the improved cleaner to different uses, changes in the proportions and dimensions of the several parts may be resorted to without departing from the spirit of the invention. 80

Having thus fully described the invention, what is claimed as new is— 85

1. A flue-cleaner, comprising a supporting-rod having screw-threaded portions, a pair of spirally-arranged blades located in front and in rear of the center of said rod, slotted disks slidably engaging the free ends of the blades, 90 and adjusting devices on the threaded portions of the rod for advancing the disks.

2. A flue-cleaner, comprising a supporting-rod provided with threaded portions and having front and rear pairs of spirally-disposed 95 blades, the free ends of which extend in opposite directions, slotted disks engaging the ends of the blades to adjust the lateral projection of the same, and nuts rotatable against the disks and mounted on the threaded portions of 100 the rod.

3. A flue-cleaner, comprising a supporting-rod provided with threaded portions and having front and rear pairs of spirally-disposed blades, the free ends of which extend in opposite directions, recessed nuts having internally-rabbeted shoulders, and disks loosely mounted within the nuts and adapted to be advanced by the rotation of the nuts, said disks having slots which receive the free ends of the 105 blades. 110

In testimony whereof I affix my signature in presence of two witnesses.

ELZA T. DAVIS.

Witnesses:

HUGH M. STERLING,  
 CHAS. S. HYER.