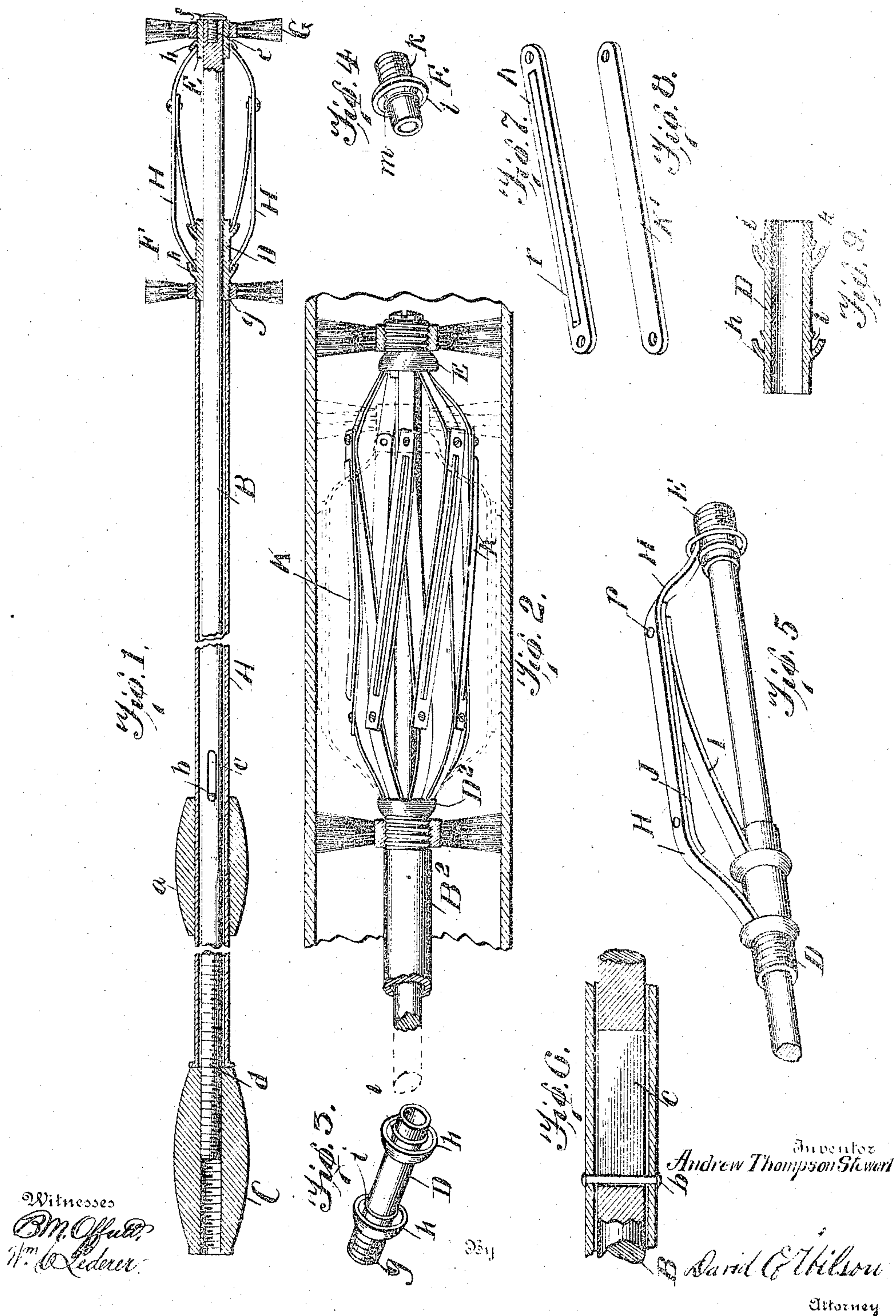


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PATENTED MAR. 10, 1908.

A. T. STEWART.
BOILER TUBE CLEANER.

APPLICATION FILED JAN. 31, 1906.



UNITED STATES PATENT OFFICE.

ANDREW THOMPSON STEWART, OF WASHINGTON, DISTRICT OF COLUMBIA.

BOILER-TUBE CLEANER.

No. 881,353.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed January 31, 1906. Serial No. 298,884.

To all whom it may concern:

Be it known that I, ANDREW THOMPSON STEWART, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Boiler-Tube Cleaners, of which the following is a specification.

My invention relates to devices for cleaning the inner sides of tubes of various kinds; and it has for one of its objects to provide a tube cleaner adapted to be readily placed in and removed from a tube and also adapted to be expanded to a greater or less extent while in the tube with a view of increasing its efficiency when properly actuated.

Another object of the invention is the provision of a tube cleaner embodying such a construction that when it is covered with a rag or cloth and manipulated in a tube it will thoroughly wipe and polish the tube.

Another object is the provision of a tube cleaner which, while possessed of the capabilities stated, is simple, compact and inexpensive in construction and is well adapted to withstand the rough usage to which such devices are ordinarily subjected.

To the attainment of the foregoing ends, the invention consists in the construction, novel combination and adaptation of parts hereinafter described and particularly pointed out in the claims appended.

In the accompanying drawings, forming part of this specification: Figure 1 is a view, partly in longitudinal section and partly in elevation, of the present embodiment of my invention. Fig. 2 is an enlarged detail view illustrating a slightly modified body of the cleaner as properly positioned in a tube, and also illustrating by dotted lines the manner in which the said body is expanded. Fig. 3 is a perspective view of the tubular end part of the cleaner body shown in Fig. 1, removed. Fig. 4 is a similar view of the head of the cleaner. Fig. 5 is an enlarged, detail perspective view showing a modified way of stiffening the bow-springs of the body. Fig. 6 is an enlarged, detail diametrical section illustrative of the manner in which the endwise-movable rod of the device is retained in the tubular casing. Fig. 7 is a perspective view of one of the scraping blades, removed. Fig. 8 is a similar view of a modified blade designed for use when a rag is to be placed about the body, and the device is to be employed as a swab. Fig. 9 is a diametrical

section of the tubular end part of the cleaner body.

Referring by letter to the said drawings: A is the tubular casing which is preferably though not necessarily, provided at an intermediate point with a hand-grasp *a*, and B is the endwise movable rod which extends through the casing A, and is retained therein by the diametrical pin *b*, disposed in the slot *c* formed in said rod B. The rod B is provided with a threaded rear portion *d*, and has a threaded socket *e* in its forward end to receive a headed screw *f*.

C is an interiorly threaded, adjusting handle mounted on the threaded portion *d* of rod B and abutting against the rear end of casing A.

D is the tubular end part of the cleaner body which is mounted on the forward portion of rod B and abuts against the forward end of casing A, and E is the head which is held on the forward end of the rod B by the screw *f*. The tubular end part D is exteriorly threaded at its inner end, as indicated by *g*, to receive a correspondingly threaded brush F, and is provided at intermediate points of its length with circumferential ribs or flanges *h* between which and the main portion of the tubular end part are formed forwardly and outwardly disposed grooves *i* for a purpose presently set forth. The head E is threaded at its outer end *k* to receive a correspondingly threaded brush G, and is provided at an intermediate point of its length with a circumferential rib or flange *l* between which and the main portion of the head is formed a rearwardly and outwardly disposed groove *m*.

H H are bowed springs which in combination with the tubular end part D and the head E constitute the body of the device. These springs H have their rear ends arranged in the rear groove *i* of part D and their forward ends in the groove *m* of head E, and hence it will be apparent that when the springs are in their normal state, as shown in Fig. 1, the part D and head will hold the same against casual displacement. It will also be apparent that when the head E is drawn rearward, the springs H will be expanded after the manner shown by dotted lines in Fig. 2, while, when the head is permitted to move forward, the springs will resume their normal positions shown in Fig. 1.

With a view of lending stiffness and

strength to the springs H I provide strips I which have their rear ends arranged in the forward groove *i* of the part D and are connected at *p* to the springs. I also in some cases rivet or otherwise connect a reinforcing strip J to the inner side of each spring H, as shown in Fig. 5, this in order to render the intermediate portion of the spring straight and parallel to the wall of a tube. When no stiffening strips I are employed, a part D², Fig. 2, which is formed integral with the tubular casing B², may be employed in lieu of the part D.

K K are scraping blades arranged diagonally on the body of the device and having edged ribs *r* on their outer sides. Each of the said blades K is connected at its rear end to one spring H and at its forward end to the next spring H, with the result that it rests at an angle to the longitudinal center of the body, and is enabled to make a drawn cut or scrape against the wall of a tube.

K¹, Fig. 8, is one of a series of blades that may be used, in lieu of the blades K, on the body of the device when it is desired to surround said body with a rag or cloth and use the device as a swab to wipe and polish a tube.

As will be apparent by reference to Fig. 1, the brushes F and G are readily removable from the head and slide, this provision being made so that the brushes may be taken off when the body is surrounded by a rag; and, the device is used as swab.

In the practical use of the cleaner, the body is inserted in a tube or pipe to be cleaned while the springs H are in their normal state shown in Fig. 1 and by full lines in Fig. 2. The handle C is then turned up on the rod B until the springs H are expanded or pressed outward sufficient to hold the blades K under pressure against the wall of the tube, when the cleaner is turned on its axis and moved endwise. On such manipulation of the cleaner, the blades will expeditiously scrape and cut deposited substance from the wall of the tube, and the brushes F and G will displace the loosened portions of such substance. At the completion of the cleaning operation, the cleaner is withdrawn from the tube while the body is expanded or else the handle C is turned outwardly on the rod B to permit the body to contract as shown by full lines in Fig. 1.

In using the cleaner as a swab, a rag or cloth is wrapped around the blades K, or around plain blades K¹, Fig. 8, employed instead of the blades K, and the device is introduced into and manipulated in the tube in the manner before described, when the tube will be thoroughly wiped and dried.

It will be gathered from the foregoing that my novel cleaner may be used to advantage in cleaning tubes, tubular molds and the like

used in the various arts, as well as smoke flues, stove pipes and analogous devices. It will also be gathered that by virtue of the adaptability of the body of the cleaner to be expanded and contracted in the manner described, the efficiency of the cleaner is materially increased, and it may be placed in and removed from tubes of various sizes with great facility.

In virtue of the ends of the springs of the cleaner body being arranged in the grooves of the head and tubular end part, it will be observed that while there is no liability of the springs being casually displaced and yet when desired one or more of the springs may be as readily removed and as readily replaced with a new spring or springs.

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

1. A tube cleaner comprising a rod, a head arranged on the rod and having a circumferential, rearwardly and outwardly disposed groove, a tubular end part mounted on the rod and having circumferential forwardly and outwardly disposed grooves, bow springs extending between the head and tubular part and having their forward ends disposed in the groove of the head and their rear ends disposed in the rear groove of the tubular end part, stiffening strips connected at their forward ends to the bow springs and having their rear ends disposed in the forward groove of the tubular end part, blades arranged diagonally and each connected at its rear end to one bow spring and at its forward end to an adjoining bow spring, and means for adjusting the rod through the tubular end part.

2. A tube cleaner comprising a rod, a head arranged on the rod and having a circumferential rearwardly and outwardly disposed groove and also having an exterior thread, an interiorly threaded brush arranged on and engaging the thread of said head, a tubular end part mounted on the rod and having a circumferential, forwardly and outwardly disposed groove and also having an exterior thread, an interiorly threaded brush arranged on and engaging the thread of the tubular part, bow springs extending between the head and tubular part and having their ends disposed in the grooves thereof, blades arranged diagonally and each connected at its rear end to one bow spring and at its forward end to an adjoining bow spring and means for adjusting the rod through the tubular part.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANDREW THOMPSON STEWART.

Witnesses:

DENNIS J. O'LEARY,
JEROME H. HENNESSY.