J. V. SYMONS.

BOILER TUBE CLEANER.

APPLICATION FILED MAR. 15, 1909.

942,798.

Patented Dec. 7, 1909.

Fig. 1.

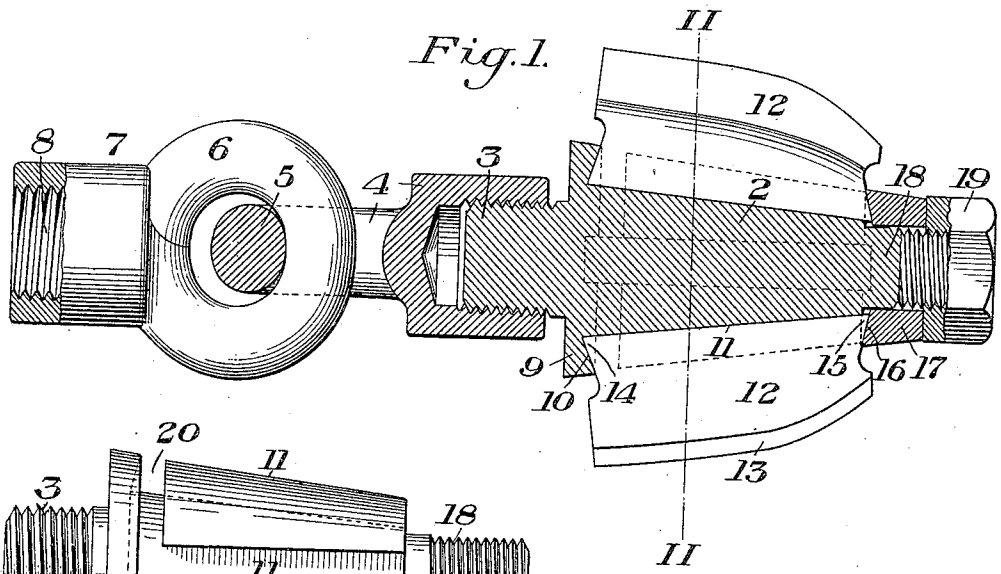


Fig. 5.

Fig. 2.

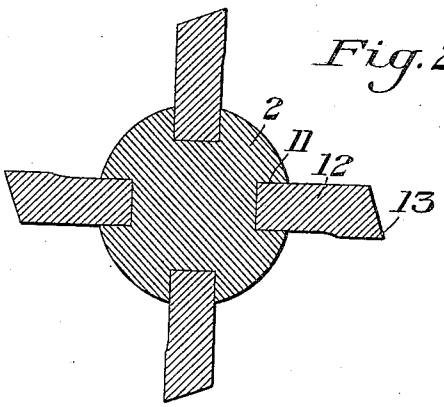


Fig. 3.

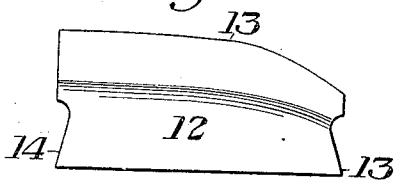
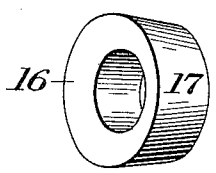


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHNSON V. SYMONS, OF JOHNSTOWN, PENNSYLVANIA, ASSIGNOR TO LIBERTY MANUFACTURING COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

BOILER-TUBE CLEANER.

942,798. Specification of Letters Patent. Patented Dec. 7, 1909.

Application filed March 15, 1909. Serial No. 483,400.

To all whom it may concern:

Be it known that I, JOHNSON V. SYMONS, of Johnstown, in the county of Cambria and State of 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, forming part of this specification, in which—

Figure 1 is a longitudinal, sectional view, illustrating the preferred embodiment of my invention; Fig. 2 is a section on the line II—II of Fig. 1; Fig. 3 is a detail view of one of the cutter blades removed, and Fig. 4 is a detail, perspective view of the washer. Fig. 5 is a side view of the head with the blades removed.

My invention has relation to the class of boiler tube cleaning tools, and is designed to provide a simple and effective tool of this character, which can be manufactured at a relatively low cost, and by means of which, scale and other deposits of a hard nature can be rapidly and effectively removed from the interiors of the tubes.

A further object of my invention is to provide a cleaning tool of this character, having its cutting blades so constructed and secured to the head of the tool that they may be readily removed for sharpening or for renewal, when necessary.

The nature of my invention will be best understood by reference to the accompanying drawing in which I have shown the preferred embodiment thereof,—it being premised, however, that various changes may be made in the details of construction and arrangement by those skilled in the art without departing from the spirit and scope of my invention, as defined in the appended claims.

In these drawings, the numeral "2", designates the head of the tool which is provided at its rear end with a cylindrical threaded shank 3 for attachment to an arm or link 4. The arm or link 4 is connected by any suitable form of universal joint with a driving shaft, not shown.

In the form shown in the drawing, the joint between the arm 4 and the driving shaft, consists of an eye 5, which is loosely engaged with an eye 6 of a joint member 7, having a threaded socket 8 for attachment to the driving shaft. Any other suitable form of joint which will permit of universal movement of the cleaning tool may be employed. The body portion of the head 2 is preferably of tapered cone form, having at its rear end a flange 9, which is undercut on its front face, as indicated at 10. The body portion of the head is also provided with a plurality of longitudinally extending grooves 11 (in present instance four) to receive the radially arranged removable cutter blades 12. These blades are tapered longitudinally, as shown, and are also formed with the beveled cutting edges 13. The cutter blades fit in the grooves 11, and their seating portions are provided at the rear end with the heels 14 which fit the undercut face 10 of the flange 9. The forward end of the seating portion of each blade is also formed with a heel 15 which engages the undercut or concave face 16, of a washer 17, which is seated around the shank 18 at the forward end of the head. This shank is threaded to receive the securing nut 19, by means of which the washer 17 is securely clamped against the forward ends of the blades and the latter are readily secured in place. By removing or loosening the nut 19, any one or all of the blades can be readily removed from the head for grinding or renewal.

To facilitate the machining of the longitudinal grooves 11, the body portion of the head may be formed with the cylindrical groove 20, in front of the flange 9.

In operation, the cleaning tool is rapidly rotated within the tube to be cleaned, and the cutting edges of the blades effectively remove the scale or other adhering deposits.

The advantages of my invention result from the simplicity of construction, whereby an effective and durable cleaning tool can be cheaply made. In practice, the cutters wear rapidly and are also liable to become injured or broken, and it has been necessary with the cleaning tools of this type heretofore in use, with which I am familiar, to throw away the entire head in case one of the blades becomes injured or broken. The proper grinding of the blades has also been a matter of difficulty. By the present invention, any one, or all, of the blades can be quickly removed and replaced by others.

I do not limit myself to the various details of construction and arrangement which I have herein shown and described, since it will be obvious that various changes may be

made in such details without departing from the spirit and scope of my invention. Thus, the shape of the head; the form of the cutting blades, and the manner of securing the blades in the head may be varied in many ways within the scope of the claims.

I claim:

1. A tube cleaning tool, comprising a head, having an undercut flange at one end, and a plurality of longitudinal extending slots forward of said flange, a plurality of cutter blades removably seated in said slots, and clamping means at the opposite end of the head for securing the blades in said slots; substantially as described.

2. A tube cleaning tool, comprising a head having a plurality of longitudinal slots, an undercut flange at one end, and a removable washer at the opposite end,—said washer having an undercut or concave face, clamping blades removably seated in said slots, and having heel portions which engage the undercut face of the flange and washer, and means for clamping the washer against the blades; substantially as described.

In testimony whereof, I have hereunto set my hand.

JOHNSON V. SYMONS.

Witnesses:

MICHAEL SWICK,

H. M. WISSINGER.