Sept. 6, 1927. 1,641,375

T. W. DAILEY

BOILER TUBE OR FLUE CLEANING IMPLEMENT

Filed Oct. 7, 1926

Fig. 1.

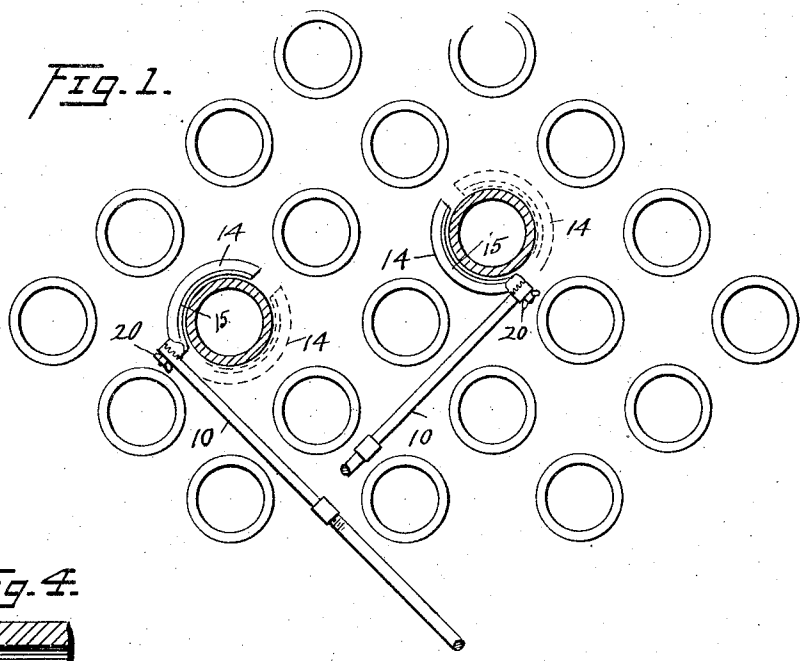


Fig. 4.

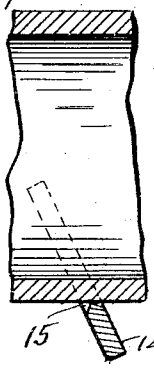


Fig. 2.

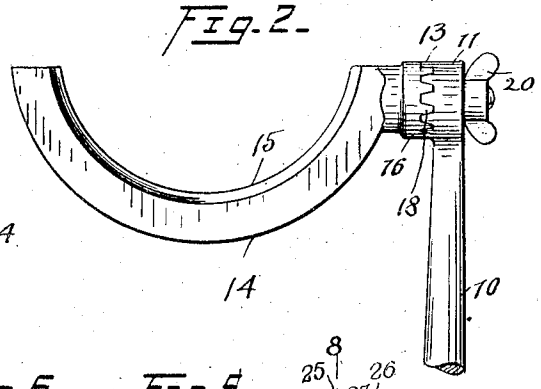


Fig. 3.

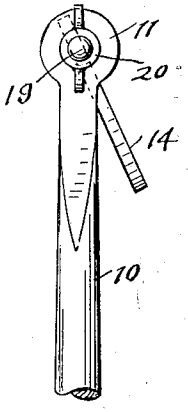


Fig. 6.

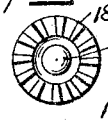
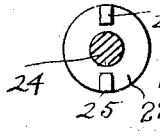


Fig. 5.

Fig. 7.

Fig. 8.



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Patented Sept. 6, 1927. 1,641,375

UNITED STATES PATENT OFFICE.

THEODORE W. DAILEY, OF CLEVELAND, OHIO.

BOILER-TUBE OR FLUE CLEANING IMPLEMENT.

Application filed October 7, 1926. Serial No. 139,998.

This invention relates to a boiler tube or flue cleaning implement and has for its object to provide a simple and inexpensive tool which is so constructed that it may be used to clean all of the tubes or flues of a boiler.

Accumulations of soot, dust and scale on the tubes or flues of a boiler greatly reduces the efficiency of the boiler and by reason of the close spacing and staggered arrangement of the tubes great difficulty has been experienced in cleaning the tubes or flues by reason of the inaccessibility of portions of the tubes.

An important object of the present invention is to provide a single tool of simple construction which may be engaged with any part of the surface of any tube or flue in the boiler and which is capable of effective cleaning action on any tube surface with which it may be engaged.

A further object of the invention is to provide a curved scraping tool adapted to conform to the curved surface of a tube or flue and mounted for angular adjustment on the handle so that its position may be reversed for engagement with opposite sides of a tube and also capable of adjustment through a lesser angle so that the blade may be so positioned that its scraping edge is at the angle to the tube most effective for removing scale therefrom.

With the above and other objects in view the invention may be said to comprise the device as illustrated in the accompanying drawings hereinafter described and particularly set forth in the appended claims together with such variations and modifications thereof as will be apparent to one skilled in the art to which the invention appertains.

Reference should be had to the accompanying drawings forming a part of this specification in which:

Fig. 1 is a diagrammatic view showing a transverse section through a bank of boiler tubes or flues and showing various positions in which the tool may be placed for cleaning the surfaces of the tubes or flues.

Fig. 2 is a side elevation of the tool.

Fig. 3 is a side elevation of the tool as viewed from the right of Fig. 2.

Fig. 4 is a sectional view showing the scraper in engagement with a tube.

Fig. 5 is a fragmentary section through the pivotal connection between the scraper and handle.

Fig. 6 is a plan view of the serrated scraper attaching head.

Fig. 7 is a fragmentary sectional view showing a modified form of connection between the scraper and handle.

Fig. 8 is a section on line 8—8 of Fig. 7.

Referring to the accompanying drawings, my improved tool is provided with a rigid handle preferably straight and of a length sufficient to reach any of the tubes of a boiler. This handle may be made in sections so that its length may be convenient for the particular tube upon which the tool is operating, the upper tubes requiring a long handle while for the lower tubes a short handle is more convenient. The handle 10 is provided with a flattened head at one end through which there is a central aperture 12 which is surrounded upon one face of the head by equally spaced radially disposed teeth 13.

A curved scraper blade of substantially arcuate form is secured to the head 11 of the handle and has an inner chisel edge 15 for scraping engagement with the surface of the tube. The curved blade 14 has an integral attaching head 16 at one end which is provided with an integral pin 17 projecting from the center thereof, the pin 17 being adapted to pass through the aperture 12 in the head 11. Upon the outer face of the head surrounding the central pin 17 there are equally spaced projecting teeth 18 adapted to fit between the teeth 13 on the head 11, the contiguous serrated faces of the heads 11 and 16 of the handle and blade forming an interlocking connection for rigidly holding the blade in any angular position to which it may be adjusted. The outer end 19 of the pin 17 is screw threaded to receive a clamping nut 20 by means of which the serrated head 16 can be clamped against the serrated head 11 to lock the blade in adjusted position. By loosening the nut 20 the blade may be moved outwardly from the handle a sufficient distance to free the teeth 18 from the teeth 13 so that the blade may be turned to any desired angle with respect to the handle. After the blade has been adjusted to the desired angle the nut can be again tightened to rigidly clamp the blade in adjusted position.

As shown in Fig. 1 of the drawing the tool may be inserted diagonally between the tubes from the bottom of the bank and may be turned to shift the scraper blade into the space between two adjacent tubes so that it

may be engaged with the top or under surface of a tube, depending upon the position of adjustment of the blade with respect to the handle. The upper portions of the tubes may be scraped with the scraper in one position and the under surfaces thereof may be scraped when the position of the blade with respect to the handle is reversed. By scraping the upper and under portions of the tubes with the tool inserted at one inclination and by again scraping the tubes in a similar manner with the tool inserted at the opposite inclination as indicated in Fig. 1 all of the tubes may be completely cleaned.

Figs. 7 and 8 of the drawing show a modified form of interlocking connection between the handle and scraper in which the blade 21 is provided with an integral head 22 with an integral pin 24 projecting outwardly from the center thereof. On the outer face of the head there are two radial grooves 25 on opposite sides of the pin and interposed between the head and the handle 10 there is an annular locking member 26 which fits over the pin 24 and is provided on one face with radial ribs 27 adapted to fit in the grooves 25 of the head and on the other face with teeth 28 corresponding to the teeth 13 on the handle and which are adapted to interfit with the teeth on the handle to lock the blade in adjusted position. The outer end 29 of the pin 24 is threaded to receive a nut 30 by means of which the blade is clamped to the handle. By providing the annular locking element separate from the attaching head of the scraper blade instead of integral therewith, as shown in Fig. 2, the scraper blade, the annular locking member and the handle may each be produced by forging and no machining operations are required on the teeth whereas in the modification shown in Fig. 2 it is necessary to cut the teeth in the scraper attaching head.

Having thus described my invention, what I claim is:

1. A boiler tube or flue cleaner comprising a handle having a transverse aperture at one end, an arcuate blade having at one end a threaded pin extending through said aperture and rotatable therein, a nut engageable with the threaded end of the pin for clamping the blade to the handle, and means forming an interlock between the contiguous faces of the blade and handle to rigidly hold the blade in different angular positions with respect to the handle.

2. A boiler tube or flue cleaner comprising a handle having a transverse aperture at one end and having one face thereof provided with serrations surrounding the aperture, an arcuate blade having at one end a threaded pin adapted to extend through the aperture and to rotate therein, a part non-rotatably secured to the blade and having a serrated face engageable with the serrated face on the handle to lock the blade against turning movement, and a nut adapted to be screwed on said pin to clamp the blade to the handle.

In testimony whereof, I hereunto affix my signature.

THEODORE W. DAILEY.