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P. RUCK ET AL.

BOILER TUBE CLEANER

Original Filed March 30, 1922

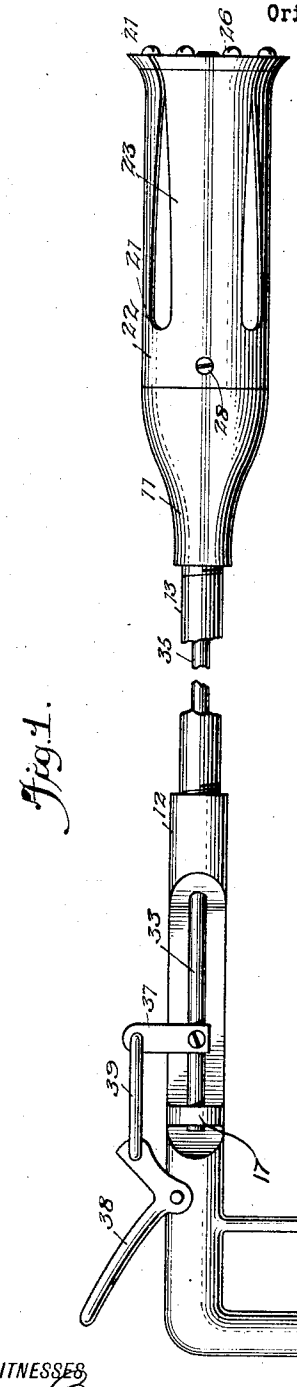


Fig. 1.

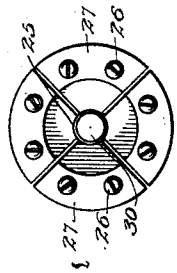


Fig. 3.

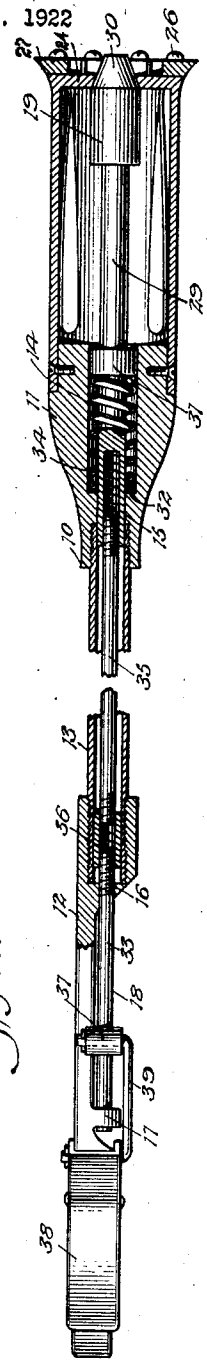


Fig. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

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BOILER-TUBE CLEANER.

Refiled for abandoned application Serial No. 548,091, filed March 30, 1922. This application filed June 7, 1927. Serial No. 197,207.

This application is a substitute for application No. 548,091 filed March 30, 1922, which became abandoned March 15, 1924.

This invention relates to cleaning devices primarily designed for use in cleaning flues, such as boiler tubes.

In cleaning certain pipes and boiler flues it is desirable to draw the material coating the inside of the same to the end.

In order to accomplish this it is necessary to provide some means of smaller diameter than the pipe or flue to be cleaned which may be projected into the same and then expanded to the diameter of the pipe or flue so that the material coating the pipe or flue may be drawn to the end.

The general object of this invention is the provision of a device having expansible means associated therewith and provided with means for expanding said expansible means so that after the device has been projected into a pipe, flue or the like, the expansible means may be expanded to clean the walls of the pipe, flue or the like as it is withdrawn from the same.

This object is accomplished by mounting on the body or handle an expansible head and associating with the body means for expanding the expansible head and providing means for operating said expanding means.

This and other objects of the invention will be more clearly understood from the following detailed description and accompaying drawings.

Figure 1 is a side elevation of the flue cleaning device;

Figure 2 is a section through the flue cleaning device showing the details of the construction;

Figure 3 is an end elevation of the flue cleaning device showing the scraper plates.

Referring to the above-mentioned drawings, a body or handle assemblage 10 consisting of a stock 11 and a handle member 12 joined together by means of a tube 13, is shown. The stock 11 has a chamber 14 provided therein and a channel 15 leading from the lower end of the chamber 14 to the tube 13. This channel is of a diameter equal to the internal diameter of the tube. A notch 18 is cut in the handle member 12 and a channel 16 communicates with the tube 13 and the notch 18. Projecting outward from the handle member is a collar 17 provided with an opening extending therethrough parallel to the length of the handle member. The handle member 12 is also provided with a hand grip 20.

Mounted on the stock 11 is an expansible head assemblage 21 which consists of a hollow cylindrical base 22 and a plurality of spring arms 23 which extend approximately parallel to the axis of the cylindrical base. Each of these arms is provided with an inturned sector shaped portion 24, the inner curved face 25 of each inturned portion being beveled. Attached to the end of each spring arm by means of screws 26 is a scraper plate 27. These scraper plates 27 are sector shaped and have their outer edges beveled so as to present a sharp scraping edge. As seen in Figure 1, the arms 23 flare outward slightly at the ends and the scraper plates are beveled so as to conform with the flaring ends of the arms 23. When the arms 23 are in their normal positions the scraper plates 27 simulate an annular plate, as seen in Figure 3. The hollow cylindrical base 22 is attached to the stock 11 by means of screws 28 and is countersunk so that the contour of the stock and the cylindrical base is one continuous surface.

A rod 29 is carried by the bearing collar 31 which is slidably mounted in chamber 14 of the stock 11. A solid head 19 having its forward end 30 frustum shaped is carried by the rod 29. A spring 34 is mounted on the rod 29 and located between the collar 31 and the shoulder 32 formed at the junction of the channel 15 and chamber 14. This spring 34 normally serves to hold the solid head 19 projected forward and in engagement with the inturned portions 24 of the arms 23. A rod 33 is slidably mounted in the channel 16 and the opening in the collar 17. This rod 33 is connected to the rod 29 by means of a connecting rod 35 which engages an internal thread provided in the end of the rod 29 and a buckle 36 attached to the rod 33.

A plate 37 is rigidly attached to the rod 33 and connected to the bell crank lever 38 by means of a link 39. This lever may be operated to give the rod 33 a reciprocating motion.

In order to adapt this flue cleaning device for cleaning flues of various lengths the connecting tube 13 and the connecting rod 35 have been provided. When it is necessary to

change the length of the cleaning device these units are removed and units of a different length are inserted in their places.

In the operation of this device the lever 38 is first pressed down, drawing the head 19 backward out of engagement with the inturned portions 24 of the arms 23. This allows the arms 23 to take their normal position. In this position the diameter of the expansible head should be smaller than the diameter of the flue or pipe which it is desired to clean. The device is then projected into the flue or pipe which it is desired to clean and the lever 38 released. The spring 34 then carries the rod 29 forward, projecting the head 19 into engagement with the inturned portions 24, forcing them outward, thus increasing the over-all diameter of the expansible head. The over-all diameter of the head should then be approximately the diameter of the pipe and as the device is drawn from the pipe or flue the material which is collected on the walls of the same will be drawn outward.

We would state in conclusion that while the illustrated example constitutes a practical embodiment of our invention we do not limit ourselves strictly to the exact details herein illustrated since manifestly the same can be considerably varied without departing from the spirit of the invention as defined in the appended claims.

We claim:

1. As a new article of manufacture a boiler tube cleaner including a body, a head comprising a cylindrical shell, one end of which is attached to the body, the shell being longitudinally slotted from its other end throughout the major portion of its length to define a plurality of integrally connected spring fingers, the free ends of which are turned inwardly and of general sectoral shape cooperatively defining an annulus having a relatively small central opening therein, arcuate scraper plates attached to the inwardly turned ends of the fingers and including scraping edges extending radially therebeyond, and a spring pressed conical spreader normally urged through the central opening to expand the blade carrying fingers.

2. As a new article of manufacture a boiler tube cleaner including a body, a head comprising a cylindrical shell, one end of which is attached to the body, the shell being longitudinally slotted from its other end throughout the major portion of its length to define a plurality of integrally connected spring fingers, the free ends of which are turned inwardly and of general sectoral shape cooperatively defining an annulus having a relatively small central opening therein, arcuate scraper plates attached to the inwardly turned ends of the fingers and including scraping edges extending radially therebeyond, and a spring pressed conical spreader normally urged through the central opening to expand the blade carrying fingers, the said first mentioned end of the shell defining a sleeve encircling a reduced neck at one end of the body at which the aforesaid attachment is made.

3. As a new article of manufacture a boiler tube cleaner including a body, a head comprising a cylindrical shell, one end of which is attached to the body, the shell being longitudinally slotted from its other end throughout the major portion of its length to define a plurality of integrally connected spring fingers, the free ends of which are turned inwardly and of general sectoral shape cooperatively defining an annulus having a relatively small central opening therein, arcuate scraper plates attached to the inwardly turned ends of the fingers and including scraping edges extending radially therebeyond, a spring pressed conical spreader normally urged through the central opening to expand the blade carrying fingers, and a rod to which the conical spreader is connected guided for sliding movement in the body, and a spring encircling the rod pocketed in the body and constituting the means for urging the spreader into engagement with the fingers.

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