

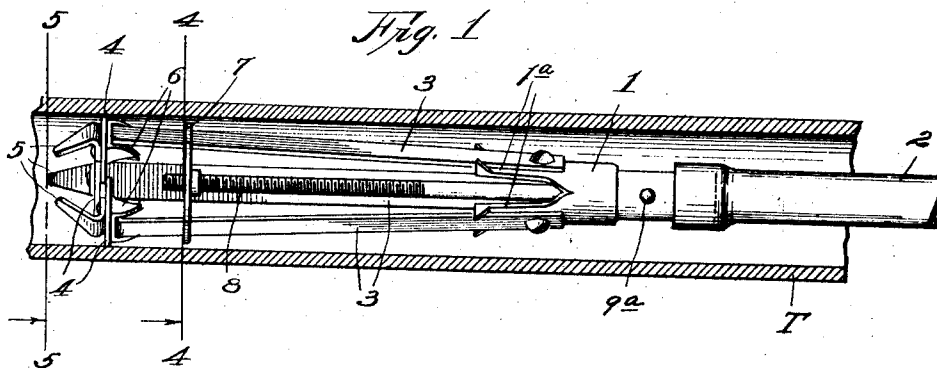
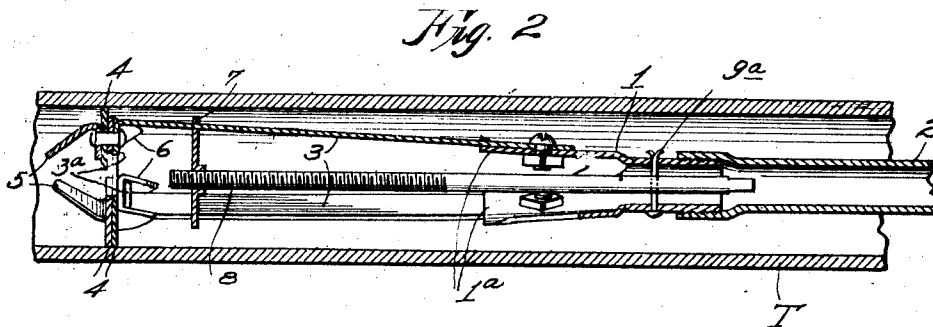
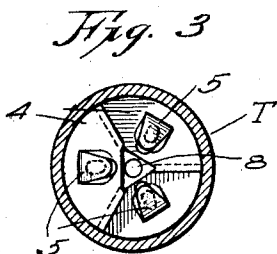
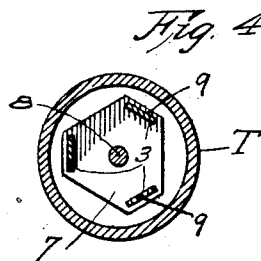
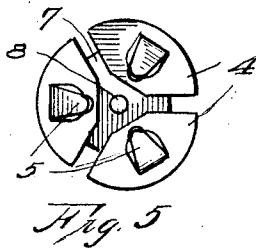
Jan. 17, 1928.

W. J. BAKER

1,656,465

FLUE SCRAPER

Filed Aug. 31, 1925



Witness:

R. Hamilton

INVENTOR.
Walter J. Baker.
BY *Thomas E. L. Field*
ATTORNEY.

UNITED STATES PATENT OFFICE.

WALTER J. BAKER, OF CHILLICOTHE, MISSOURI.

FLUE SCRAPER.

Application filed August 31, 1925. Serial No. 53,465.

This invention relates to improvements in flue scrapers, and refers more particularly to a device for removing soot, scale, sediment or other deleterious matter from the interior of cylindrical pipes or flues. It is primarily adapted for use in cleaning tubes of steam boilers.

Fig. 1 is a side elevational view of the device.

Fig. 2 is a side elevational section of the device.

Fig. 3 is a front view of the cutters.

Fig. 4 is a view taken along the line 4—4 in Fig. 1.

Fig. 5 is a view taken along the line 5—5 in Fig. 1 with the cutters partially spread.

Referring to the drawings, at 1 is shown a hollow shank to which is attached—either screw-threaded or otherwise—a portion of pipe or handle 2 by means of which the scraper is pushed forward and backward through the tubes. The end of this shank is severed in two or more parts shown at 1^a in the form of flattened portions to which are attached the spring members 3. These spring members are preferably formed of spring steel and are riveted or bolted to the flattened portions of the shank. The upper end of the spring members are turned inwardly, as shown at 3^a, to form a flattened portion. These flattened portions are punched with irregular holes to receive rivets which extend through the cutters 4 which are mounted upon the flattened portions of the spring members. The purpose of these irregular or elongated punched holes in the bent over portions of the spring members carrying the cutters, is to prevent displacement or shifting of the cutters or guides. These cutters are shaped to form the sectors of a circle, their outer surfaces being rounded in form, the three cutters forming a complete circle and conforming with the interior surface of the tube. The cutters are positioned at substantially right angles to the spring members so that in their passage backward and forward through the tubes the outer arcs of the cutters are constantly abraded by the interior of the tubes, maintaining at all times relative sharp edges on both the front and rear contacting edges of the cutters. Furthermore, the cutters are of tempered steel to better withstand the wear and friction to which they are subjected. On the front of the cutters are front entrance guides 5 which facilitate the insertion of the

cutter into the tube. In the same way, beneath the cutters are attached rear guide members 6 to assist in feeding the cutters into the tube when the scraper is drawn rearwardly through the tube. The particular form of guide may be varied according to circumstances, as the function of both the front and rear guides is merely to assist in the entering of the scraper into the tube when it is pushed forwardly or withdrawn rearwardly through the tube.

Centrally of the spring members is positioned an adjustable cutter spreader 7 which is mounted on a central spreader stem 8. This stem is threaded for a considerable portion of its length and is screwed into the center of a threaded hole in the cutter spreader member. The cutter spreader is slotted, as shown at 9, to accommodate the spring members which pass therethrough. The function of the spreader is to increase or decrease the size of the cutting circle. This is accomplished by longitudinally moving the spreader either forwardly or rearwardly along the spring members by means of the threaded stem. A key or pin 9^a is inserted in a hole drilled through both the shank 1 and the spreader stem 8. The function of this key or pin is to hold the stem and likewise the adjustable spreader in a permanent set position, thereby making the adjustment of the cutting circle set or permanent. In operation, when the spreader is screwed forward toward the cutter members, the diameter of the cutting circle is decreased and conversely when the spreader is screwed rearwardly, by manipulation of the spreader stem after removal of the pin or key, the spring members are spread and the cutting circle increased to the desired amount. The cutters are detachable in order that they may be replaced in case they are broken or new cutters are required. This enlarging or decreasing of the cutting circle is effected by the forward or rearward movement of the spreader due to the fact that the spring members are positioned upon the flattened portions of the shank and extend outwardly therefrom in tapered relation, i. e., their outer extremities are at a greater distance from a central point than are the ends of the spring members which are attached to the flattened portions of the shank.

The novel and advantageous features of the present invention lie in the fact that the

flue scraper as described is of light construction and, when mounted upon the end of a long handle or pipe, is easily manipulated by an operator. Furthermore, the form and positioning of the cutters automatically maintains sharpened outer edges on the cutters due to the natural wear of use. Furthermore, the front and rear guides facilitate the entering or introduction of the scraper into both the front and rear ends of the tubes. The adjustable spreader serves a double function—first, to set the cutters in a manner to give the desirable tension to the cutters against the interior walls of the tubes in order to remove the deleterious matter therefrom, and furthermore, to maintain this tension in spite of wear occasioned by constant use of the scraper.

In addition to the advantages stated above, the scraper is exceptionally rugged and durable and requires the least amount of effort to produce a maximum amount of cleaning. It is a notorious fact that the irksome duty of cleaning flues is, to a great extent, neglected due to the difficulty in manipulating the common type of flue or tube scraper or cleaner. The cutters in the scraper described are of steel having almost glass hardness which assures, at all times, a keen cutting edge.

I claim as my invention:

1. In a flue scraper, the combination with a hollow shank, of a plurality of spring members attached thereto, cutters mounted on said spring members, an independent spreader stem rotatable in the shank, a spreader having engagement with the spring members and adjustably mounted upon the spreader stem, whereby the cutters are manually adjustable relative the interior diameter of a flue, and means for locking said stem against rotation.

2. In a flue scraper, the combination with

a shank, of a plurality of spring members attached thereto, cutters on said spring members, an independent spreader stem rotatable in the shank, a spreader having engagement with the spring members, and adjustably mounted on the spreader stem, a pin for locking the stem against rotation or longitudinal movement in the shank.

3. In a flue scraper, the combination with a shank, of spring members attached thereto, cutters mounted on said spring members, the edges of said cutters conforming with the interior surface of the flue, a spreader stem extending through the shank, a cutter spreader adjustably mounted on said stem whereby the diameter of the cutter members may be increased or decreased, a key member extending through the shank and stem for holding the spreader in a fixed position and preventing the increasing or decreasing of the size of the cutting circle.

4. In a flue scraper, the combination with a shank, spring members attached at their inner extremities thereto, cutters attached to the spring members, elongated holes in the spring members and cutters, guide members on the faces of the cutters also having elongated holes and fastening means snugly fitting the holes to secure the cutters and guide members immovably to the respective spring members.

5. In a flue scraper, the combination with a hollow shank, spring members attached at their inner extremities thereto, cutters at the outer extremities of the spring members, an independent spreader stem rotatable in the shank, a spreader having closed slots through which the spring members pass, and mounted upon a threaded portion of the spreader stem, a pin extending through the shank and stem for locking the adjustment put upon the spreader.

WALTER J. BAKER.