P. H. Coyle,

Boiler Cleaner

No. 102,374. Patented Apr. 26, 1870.

Fig. 1

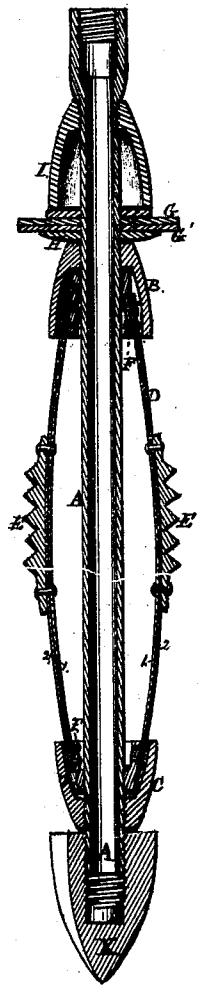


Fig. 2

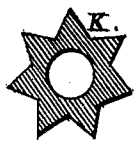


Fig. 3

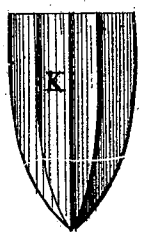
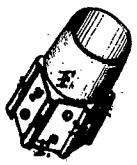


Fig. 4

Fig



Witnesses
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UNITED STATES PATENT OFFICE.

PATRICK H. COYLE, OF NEWARK, NEW JERSEY.

BOILER-TUBE CLEANER.

Specification forming part of Letters Patent No. **102,374**, dated April 26, 1870.

To all whom it may concern:

Be it known that I, PATRICK H. COYLE, of the city of Newark, county of Essex, and State of New Jersey, have invented certain Improvements in Tube-Cleaners; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

The present invention is an improvement upon the tube-cleaner patented to me November 9, 1869, No. 96,552.

My improvements relate to the construction of the springs, the means for securing the more uniform and steady action of the scrapers, and which means also serve to facilitate the putting together and taking apart the apparatus, to the employment, in combination with the scrapers, of elastic disks or rings, serving as a brush to more thoroughly cleanse the tubes, and to the employment upon the implement of a spear-head to pierce and break any stubborn solid matter or coke that may collect in the tubes.

A is the tubular rod upon which all the other parts are mounted, all the parts being shown in Figure 1 in longitudinal section.

B and C are the removable heads or cups, which receive within their cavities the ends of the springs and their heads, and which, as in my former patent, serve, by being turned in one direction upon the screw-thread on the rod, to cause the springs to bulge and expand the diameter of the circle of the series of scrapers and by being turned in the other direction to allow the springs to resume more or less of their normal condition, and hence to contract and lessen the diameter.

The springs D, upon which are secured the scrapers E, instead of being made as in my above-named patent, each of a single piece, I make of two thin pieces of steel, 1 2, each laid flat upon the other, the scraper being secured to them by rivets passing through both springs. I thus attain more elasticity and greater durability than when the spring is made of a single piece, and the elasticity is preserved longer, and the elasticity of all the springs is rendered more uniform with regard to each other.

Instead of cutting away a portion of the ends of each spring and inserting its ends loosely in an opening or slot in a loose disk of metal, I provide a head, F, for each end, fasten fixedly the springs thereto with screws or rivets, as shown, and also provide ridges 3 upon the heads, (see Figs. 4 and 5,) the springs being preferably made of such breadth as to fill the space between the ridges, the latter thus serving also, independently of the screws or rivets, to aid in holding the springs from lateral movement. This positive uniting together into one whole of the springs (and scrapers) and the two heads not only prevents any accidental disarrangement of the parts when in action, but also prevents any rocking or wabbling, and the consequent strain or torsion of the springs and the liability of damage to individual springs; and in putting together or taking apart the apparatus for any purpose the springs cannot drop away from their heads, or vice versa, wasting time to collect and put them together again. The form of the head F also, by reason of having a long bore, causes it to hold its place more firmly upon the rod than is possible with a thin disk or button. By firmly uniting these parts together I also insure a perfectly-uniform collapse of all the springs together, as all must move positively and coincidently when permitted to straighten out after having been expanded.

G G′ are disks of gum, rubber, felt, or equivalent material, perforated at the center to admit the rod A, and serving as a brush to clean and carry out from the boiler or other tube all the fine dirt that may be left behind the scrapers. Instead of such disks or rings, an annular wire brush may be employed and secured in the same manner as shown in the drawings by being clamped between two parts, H and I, one or both of which may be removable from and adjustable upon the rod, to allow of the putting on, taking off, and tightening of the brush.

Upon the forward end of the rod is fastened a fluted pointed spear-head, K, (shown in plan in Fig. 3, in cross-section in Fig. 2, and in central longitudinal section in Fig. 1.) In marine boilers and in locomotive-tubes, and wherever boiler-tubes become leaky, coal or coke accumulates and hardens in them, and they require to be penetrated, and this accumulation to be broken and removed. This spear-head is designed for this purpose, and it acts as a pioneer boring-tool, and opens the way for the scraper and brush, each succeeding

the other in order, and finishing up the work left undone by the other. By turning the scraper on its longitudinal axis while within the tube the ribs of the spear-head act as levers to break away the coke, &c.

I claim—

1. The combination, with a circular system of scrapers, of the double springs 1 2, when the latter are all rigidly affixed to the heads, as shown and described

2. The combination, with an expansible boiler-tube cleaner, of the ribbed spear-head K, as and for the purpose set forth.

3. The combination, with an expansible boiler-tube cleaner, of a brush acting in rear of the scrapers, as and for the purpose set forth.

4. The combination, of the ribbed spear-head, a circular system of scrapers, and a follower-brush, substantially as shown and set forth.

PATRICK H. COYLE.

Witnesses:
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