

(No Model.)

J. B. CHRISTOFFEL.
BOILER TUBE SCRAPER.

No. 423,128.

Patented Mar. 11, 1890.

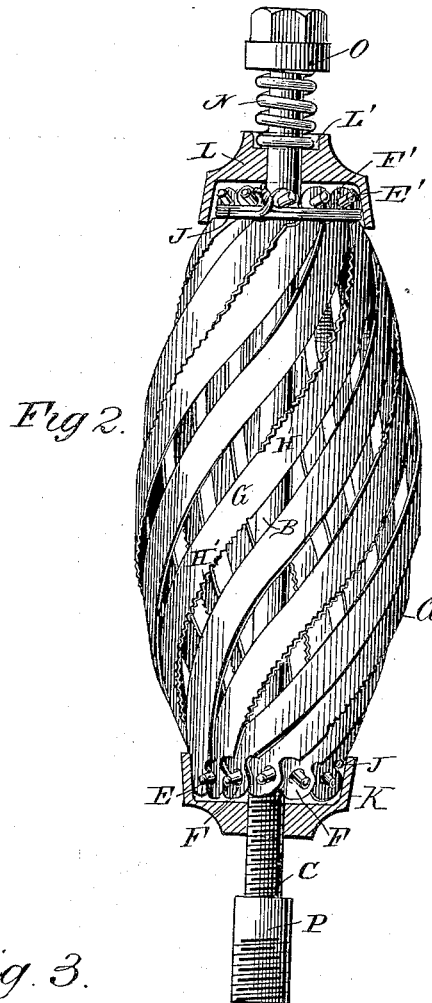
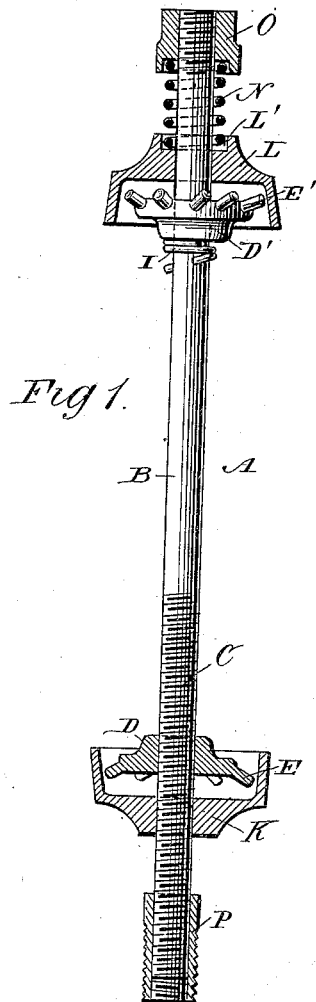
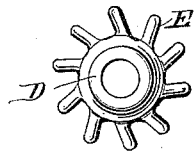


Fig 3.



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UNITED STATES PATENT OFFICE.

JOHN B. CHRISTOFFEL, OF BROOKLYN, NEW YORK, ASSIGNOR TO ANNA CHRISTOFFEL, OF SAME PLACE.

BOILER-TUBE SCRAPER.

SPECIFICATION forming part of Letters Patent No. 423,128, dated March 11, 1890.

Application filed December 13, 1889. Serial No. 333,631. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. CHRISTOFFEL, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Boiler-Tube Scraper, of which the following is a full, clear, and exact description.

The invention relates to boiler-tube scrapers, such as shown and described in the United States Letters Patent No. 137,826, granted to me April 15, 1873.

The object of the present invention is to provide a new and improved boiler-tube scraper which is simple and durable in construction and can be easily and quickly contracted or expanded to fit various-sized tubes, and which serves to cut the hard crust usually formed in water and steam tubes by sediment formed from substances contained in the water or the fluid passing through the tube.

The invention consists of a series of spring-blades having serrated edges and arranged spirally.

The invention also consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement with the spring-blades removed and the central rod in elevation. Fig. 2 is a like view of the same with the spring-blades in position and shown in elevation, and Fig. 3 is a plan view of one of the collars for fastening the spring-blades to the central rod.

The improved boiler-tube scraper A is provided with a central rod B, the lower end of which is provided with a screw-thread C, on which screws a collar D, provided on its periphery with a series of pins E, projecting downward and at an angle, as is plainly shown in Fig. 3, and on which are hooked eyes F, formed on the spring-plates G, hooked by the eyes F' on the other ends on similar pins E', projecting upward from a collar D', and also standing at angles similarly to the pins on the collar D. The collar D' is held loosely near the upper end of the rod B, and

rests on a short coiled spring I, secured on the rod B. (See Fig. 1.)

The spring-blades G, as shown in Fig. 2, are bent spirally, and are either smooth at their edges or provided with serrations H and H', of which the former are arranged near one end at one edge, while the serrations H' are arranged on the other edge at the opposite end, as is plainly shown in Fig. 2.

All the blades G may be provided with serrations H or H', or only a few of them, or, as shown in the drawings, every alternate one, the front serration H acting on the crust in the tube when the scraper is moved forward, while the other serration H' acts on the crust when the scraper is pulled rearward.

In order to hold the eyes F and F' securely on the pins E and E', respectively, a wire band J is placed around the eyes next to the pins E and E', thus preventing the eyes from becoming detached from the pins. The ends of the spring-blades G, as well as the pins E and E' and the wire bands J, are covered up by collars K and L, each provided with a flange passing over the said parts, as is plainly shown in Fig. 2. The collar K screws on the thread C, while the collar L is held loosely on the upper end of the rod B, and is pressed over the pins E', the eyes F', and the wire J by a spring N, pressing with one end against the outer end of the collar L and resting with its other end on a nut O, screwing on the outer end of the rod B.

By adjusting the nut O the tension of the spring can be regulated so as to press the collar L with more or less force over the upper ends of the spring-blades G, as previously described. The pins E and E' are arranged angularly, so as to prevent the displacement of the eyes F and F' when the spring-blades are contracted or expanded by turning the nut K up or down on the thread C of the rod B.

When the operator desires to use the device, he screws the nut K outward on the thread C, and then turns the screw-rod B by holding the blades G stationary in the hand or in part of the tube until the diameter of the series of blades G corresponds with the inside diameter of the tube to be cleaned. The operator then turns the screw-rod B in

an opposite direction, so as to move the nut D inward, whereby the blades G are expanded and fit snugly on the inside of the tube, after which the entire scraper is moved forward and backward in the tube by a suitable handle screwing on a collar P, held on one end of a screw-rod B. When the device is pushed inward in the tube, the serrated front edges of the blades G cut into any crust which may have formed on the inside of the tube, and as the said blades are arranged spirally the crust is cut in small chips throughout the interior of the tube, said chips passing between successive plates and being removed from the tube when the scraper is drawn outward. When this latter movement takes place, the serrated edges H' of the plates G again cut into any remaining sediment which may adhere to the inside of the tube. Thus by drawing the scraper once or twice through a tube the latter is thoroughly cleaned of all sediment or other matter contained in the tube. It will be seen that as the spiral blades G can be expanded or contracted so as to bulge in the middle the scraper can be used on various-sized tubes.

The blades G form in the middle a cylinder which guides the scraper in the tube, while toward the ends the serrated edges of the blades extend outward, so as to cut easily into the crust contained in the tube.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a boiler-tube scraper, a series of spring-blades having serrated edges and arranged spirally, substantially as shown and described.

2. In a boiler-tube scraper, a collar provided with pins standing at angles and projecting outward, substantially as shown and described.

3. In a boiler-tube scraper, the combination, with a screw-rod, of a collar having pins and held loosely on the said screw-rod, a second collar screwing on the said screw-rod and also provided with pins, and a series of spiral blades having eyes held on the pins of the said collars, substantially as shown and described.

4. In a boiler-tube scraper, the combination, with a screw-rod, of a collar having pins and held loosely on the said screw-rod, a second collar screwing on the said screw-rod and also provided with pins, a series of spiral blades having eyes held on the pins of the said collars, and wire bands passing around the eyes of the said spring-blades to hold the latter on the said pins, substantially as shown and described.

5. In a boiler-tube scraper, the combination, with a screw-rod, of a collar having pins and held loosely on the said screw-rod, a second collar screwing on the said screw-rod and also provided with pins, a series of spiral blades having eyes held on the pins of the said collars, wire bands passing around the eyes of the said spring-blades to hold the latter on the said pins, a collar having a flange and screwing on the said screw-rod, and a second spring-pressed collar held on the other end of the said screw-rod, substantially as shown and described.

6. In a boiler-tube scraper, a series of spring-blades arranged spirally, and of which each alternate one is provided on opposite edges on its ends with serrations, substantially as shown and described.

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Witnesses:

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