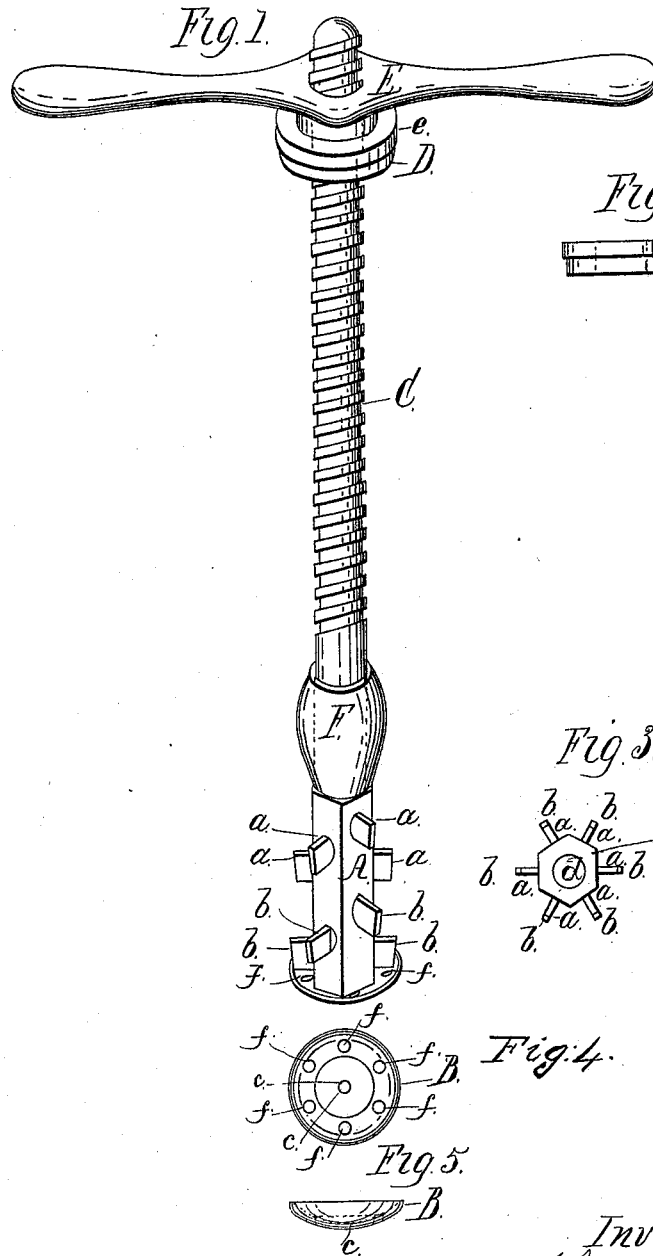


*Daley & Marrill,*  
*Steam-Boiler Cleaner.*

*No 46,339.*

*Patented Feb. 14, 1865.*



*Witnesses;*  
*Stephen Welch,*  
*John White*

*Inventors;*  
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*Joseph H. Hearwill*

# UNITED STATES PATENT OFFICE.

JOHN DALEY AND JOSEPH H. MARVILL, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN TOOLS FOR SCALING TUBES OF BOILERS.

Specification forming part of Letters Patent No. 46,339, dated February 14, 1865.

### *To all whom it may concern:*

Be it known that we, JOHN DALEY and JOSEPH H. MARVILL, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Boiler-Tube Scaling-Tool; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the tool. Fig. 2 is an edge view of the guide D. Fig. 3 is a top view of the cutter-stock A. Fig. 4 is a top view of the circular cutter B. Fig. 5 is an edge view of the same.

Like letters in all the figures represent the same parts.

The nature of our invention consists of a tool for removing the scale or incrustation from the internal surface of the tubes of steam-boilers. Its construction and operation will be understood by the following description.

A is a cutter-stock, which is provided with perpendicular rows of cutters that project radially from its periphery. In the drawings but two cutters are represented in each row, yet a greater number may be used, if desired.

The upper cutters, *a*, are shorter than the lower ones, *b*, the former cutting a portion of the depth of the scale, and the latter the remainder, or nearly so. These cutters are made double, running clear through round holes in the cutter-stock, the part of the cutters which they embrace being of corresponding form. This form of the holes we prefer, simply on account of convenience in its construction; otherwise square holes would be preferable.

B is a circular dish-form cutter, which is secured on the lower end of the cutter-stock A by means of a screw, which passes through the central opening, *c*, of the cutter, as seen in Figs. 4 and 5, or in any other convenient manner. The object of the said cutter is to cut off the remaining portions of the scale which are left by the radial cutters *a b*. It is slightly less in diameter than the inside of the tubes, to prevent its cutting the latter. The said cutter B also serves as a guide to keep the cutter-stock A in its central position as it passes through the tube. The cutter-stock A is moved in its upward motion during the op-

eration of the cutters and in its return to the bottom of the tube by means of the central screw-shaft, C, the lower end of which is securely fastened in the upper end of the said stock by means of a screw formed on the shaft which fits in the opening *d*, as seen in Fig. 3. The upper end of the shaft slides in the circular guide-piece D, which fits in the end of the tube, there being an annular flange, *e*, that rests on its end.

E is a handle for operating the screw, there being a female screw in the former, which fits thereon. On the lower end of the stock, and resting on the upper end of cutter-stock A, there is an Iowa guide, F, which is somewhat smaller than the interior part of the incrustation of the tube, so as to pass freely through the same and act as a partial guide to the cutters, especially until the circular cutter B has entered the bottom of the tube.

The operation is as follows: The cutter-stock A being placed in the bottom of the tube and the guide D in the upper end of the same, the handle E is turned in the direction of the arrow, causing the screw-shaft C to ascend in the tube to operate the radial cutters *a b* and the circular cutter B until they have passed through the incrustated part of the tube, the scale by the operation of the cutters being made fine enough to pass through the openings *f* in the circular cutter B. The dish form of the cutter causes the particles to readily fall into the openings which are toward its center, as seen in Figs. 4 and 5.

It will readily be seen that a great amount of time and expense may be saved by the use of this tool, inasmuch as the tubes may remain in the boilers until they are worn out, whereas they ordinarily have to be replaced with new ones as soon as the scales become so thick as to render them unserviceable, which is usually in about two years, and thus not only involving a heavy expense in the price of new tubes and in the labor of replacing them, but causing great inconvenience and expense in the loss of time during the operation.

Having thus fully described the construction and operation of our boiler-tube scaling-tool, what we claim therein as new, and desire to secure by Letters Patent, is—

1. The combination and arrangement of the

cutters *a b* in the cutter-stock A, the cutter-stock being operated by the central screw-shaft, C, substantially as herein set forth.

2. The combination and arrangement of the circular cutter B with the cutter-stock A, substantially as and for the purpose set forth.

3. The combination of the guide D with the screw-shaft C, arranged in relation to the tubes, substantially as and for the purpose set forth.

4. The combination of the guide F with

the screw-shaft C, substantially in the manner described, and for the purpose specified.

In testimony that the above is our invention we hereunto set our hands and seals, this 4th day of January, 1865.

JOHN DALEY.

[L. S.]

JOSEPH H. MARVILL.

[L. S.]

Witnesses:

STEPHEN USTICK,

JOHN WHITE.