

C. H. Keener,
Steam-Boiler Cleaner.

N^o 49,416.

Patented Aug. 15, 1865.

A detailed technical drawing of a mechanical device, possibly a pump or engine component. The drawing shows a central vertical shaft (A) passing through a large, circular flywheel or gear (B) with radial spokes. Above the flywheel is a horizontal arm (C) with a handle (D) and a hook (E). The shaft is supported by a frame (F) with rollers or guides (G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z). The base of the device is mounted on a frame with rollers or guides (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z).

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UNITED STATES PATENT OFFICE.

CHARLES H. KEENER, OF THE UNITED STATES NAVY.

IMPROVEMENT IN SCALE-BORERS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. 49,416, dated August 15, 1865.

To all whom it may concern:

Be it known that I, CHARLES H. KEENER, of the United States Navy, have invented a new and Improved Scale-Borer; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a sectional front elevation of this invention. Fig. 2 is a sectional side elevation of the same.

Similar letters of reference indicate like parts.

This invention relates to a tool intended to remove the scale from the interior of boiler-tubes, and particularly from tubes in what is known as the "Martin boiler."

In order to be able to introduce the tool into the boiler, it must be so arranged that it can be taken apart and its parts passed through the man-hole, and that the same, after having all been passed into the boiler, can be put up in the limited space which is afforded for this purpose, and which in Martin boilers, such as are in general use in the United States Navy, does not generally exceed thirty inches in height.

My tool consists of a bed-plate, A, to which is bolted by means of a screw, *a*, the standard B, and this standard is provided with a journal-box, *b*, on its top to form the bearing for the driving-shaft C, and with two boxes, *c c*, on its side, which form the bearings for the hub D of a bevel-wheel, E, as shown particularly in Fig. 2 of the drawings. The bevel-wheel E gears into another wheel, F, mounted on the end of the driving-shaft, and it is bored out to receive the bore-spindle G. This spindle connects with the wheel and its hub by means of a feather-key fitting into a groove, *d*, so that it is compelled to rotate with the same and still allowed to slide through it in a longitudinal direction.

Secured to the lower end of the bore-spindle is the cutter-head H, which is furnished with two or more adjustable cutters, *f*, that serve to remove the scale from the interior of the tubes. To avoid injury to the tubes the cutters must be adjusted to bore somewhat smaller than the bore of the tube, and the scale which may still remain adhering to the tube can be removed

by scrapers, which may be secured to the top of the cutter-head, and which ought to be made yielding, so that they are enabled to follow existing irregularities in the inner surface of the tube.

The bore-spindle is fed down through the tube by means of a hand-lever, I, which has its fulcrum on a pivot, *g*, that is adjustable in a standard, J. A clamp, K, which is attached to the hand-lever, and the jaws of which catch into a circular groove, *h*, turned in the upper end of the bore-spindle, forms the connection between said spindle and the hand-lever, as shown in Fig. 2, and one of the jaws of said clamp is movable, so that the same can be readily attached to or detached from the hand-lever. After the spindle has been fed down as far as its length will permit it is clamped in the hub D by means of a suitable set-screw, and another length, G*, is added to it. This additional length is provided with a screw at its lower end to screw into a corresponding socket in the upper end of the spindle G, and the upper end of said additional length is furnished with a circular groove, *h**, so that the clamp K can be conveniently connected to it. By these means the cutter can be fed through the entire length of the tube.

If desired, an ordinary feed-screw may be used instead of the hand-lever I.

The crank L, which serves to impart motion to the driving-shaft, is slotted, so that its handle can be moved closer to or farther from the center of rotation, according to the power required.

The bed-plate A is slotted and provided with suitable clamping-screws, by means of which it can be secured to the tube-sheet.

By this tool the operation of scaling boiler-tubes is rendered easy, and the tubes are not liable to be injured.

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

The combination and arrangement of the bed-plate A, spindle G, cutter-head H, auxiliary spindle G², hand-lever I, clamp K, and standard J, substantially upon the principle and in the manner as herein set forth.

CHARLES H. KEENER.

Witnesses:

THOMAS HARRISON,
THOS. HANNIGAN.