W. HARPER.

FLAME TUBE CLEANERS FOR STEAM BOILERS.

No. 180,025. Patented July 18, 1876.

Fig. 1

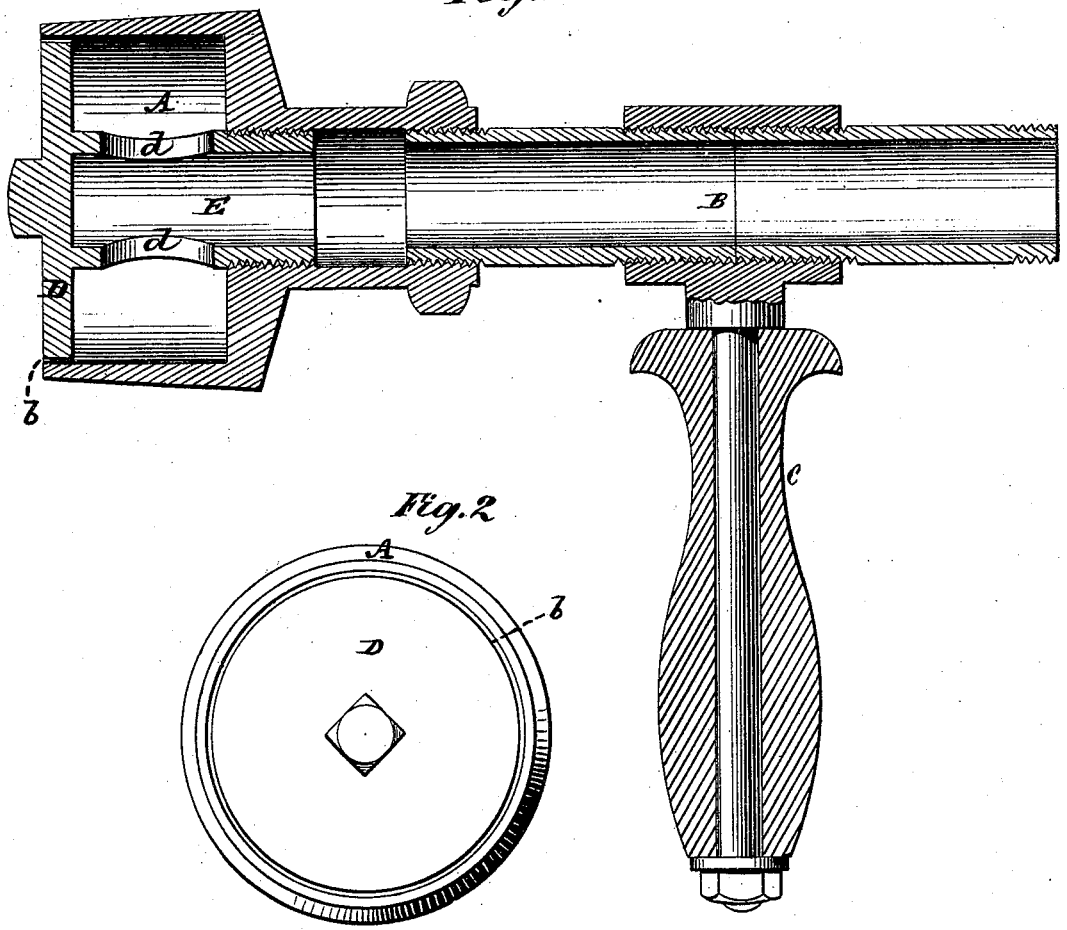

Fig. 2

Witnesses:
Michael Ryan
Fred. Haynes

William Harper
by his Attorneys
Brown & Allen.

UNITED STATES PATENT OFFICE.

WILLIAM HARPER, OF NEW HAVEN, CONNECTICUT, ASSIGNOR OF ONE-HALF HIS RIGHT TO WILLIAM T. PORTER, OF SAME PLACE.

IMPROVEMENT IN FLAME-TUBE CLEANERS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **180,025**, dated July 18, 1876; application filed May 29, 1876.

To all whom it may concern:

Be it known that I, WILLIAM HARPER, of the city and county of New Haven, in the State of Connecticut, have invented certain new and useful Improvements in Steam-Tube Cleaners; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms part of this specification.

This invention relates to means for cleaning the tubes of tubular boilers and other tubular structures by blowing a current or currents of steam through the tubes.

The invention consists in a steam-tube cleaner, provided with a hollow plug or shell, constructed to enter and fit the end of the tube in the boiler, and closed at its back, excepting where the same communicates with a steam-supply pipe or branch, but having one or more openings in front for escape of the steam from said hollow plug into and through the boiler-tube. Said hollow plug forms a steam head or receptacle, which, by its closing the end of the boiler-tube, confines all the escaping steam within and to the tube, and prevents any steam or soot from blowing back upon the operator.

The front end of this hollow plug it is proposed to construct or provide with a plate or disk attached to a perforated steam-supply stem within the plug, and fitted and proportioned to leave a small steam-outlet, preferably a continuous annular one, beyond the edges of said disk, and between the same and the front end or edges of the body of the plug, whereby the steam, as it issues from the plug, is directed and distributed with the full boiler-pressure along the interior surfaces or sides of the tube, thus effectually cleaning the latter, and economizing both steam and time in the performance of its work.

Such tube-cleaning device is connected with the boiler for supplying it with steam, by any suitable pipe or hose attachments, and may be separately applied to each tube in succession to effect a separate cleaning of the tubes; and to facilitate its manipulation as a convenient and portable tube-cleaner, it is furthermore proposed to combine with it a wooden or other handle, as hereinafter described.

Figure 1 represents a longitudinal section of a steam-tube cleaner constructed in accordance with my invention, and Fig. 2 a front view of the same.

A is the hollow steam plug or shell, made tapering externally, and of a size to enter and form a close fit within the end of a boiler-tube. B is a hollow stock, to which said hollow plug is attached by socket in its rear, and which serves to supply the plug or shell A with steam by a hose or pipe applied to connect the back end of the stock with the steam-space of the boiler.

A handle, C, preferably made of wood or other poor conductor of heat, is attached to the one side of the stock B, or to a coupling uniting two separate lengths or sections of the stock, to facilitate the manipulation of the cleaner when applying it successively to the several tubes of the boiler, and to add to its convenience as a portable steam-tube cleaner, designed to be applied by hand.

D is a plate or disk, fitted within the front end of the hollow plug or shell A, and mainly closing the same, but leaving a contracted annular outlet or opening, *b*, all around the plate or disk, whereby the steam is delivered in a thin stream, at full boiler-pressure, or thereabout, along the interior sides of the tube which is being cleaned, and which is closed by the plug. This disk D may be carried by a hollow stem, E, arranged within the shell A, and fast to the back of the latter, or fitting within the rear socket thereof, and virtually forming a forward continuation of the hollow stock B. Said hollow stem E has one or more perforations, *d*, in it for distributing or supplying the steam to the hollow shell A.

I claim—

In combination with the hollow head A, secured to and communicating with the tube B, the hollow perforated tube E, carrying the disk D, the whole adapted to be secured in the head A, so as to leave an annular outlet for the same, substantially as described.

WILLIAM HARPER.

Witnesses:

ADOLPH ASHER,

DAVID CURTISS.