

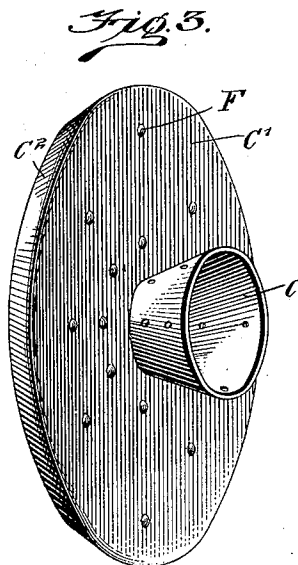
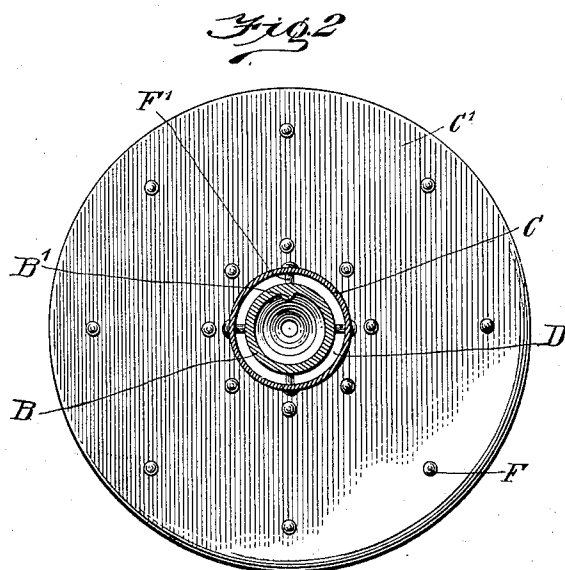
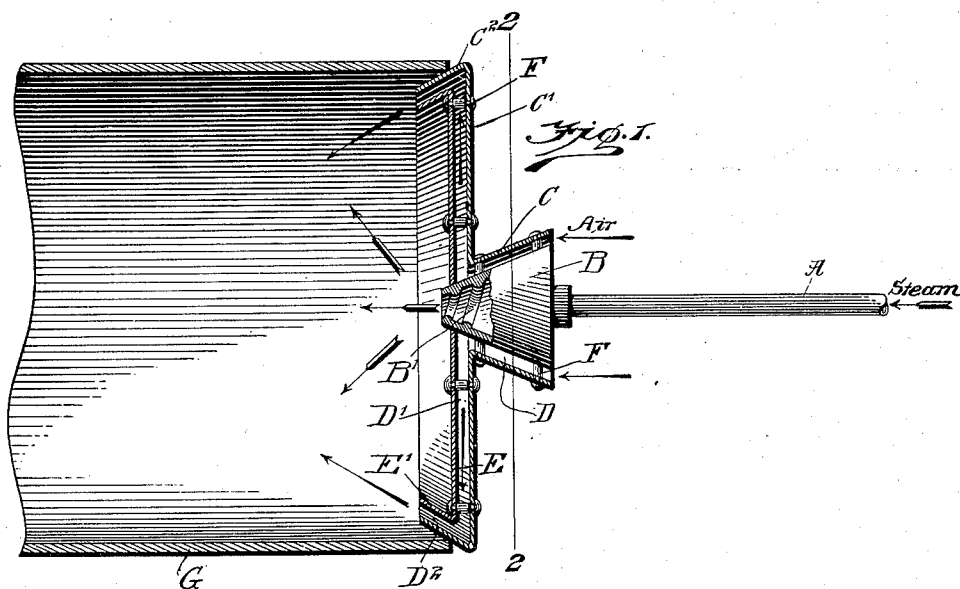
No. 653,090.

Patented July 3, 1900.

W. H. INGERSOLL.
BOILER TUBE CLEANER.

(Application filed Apr. 17, 1900.)

(No Model.)



WITNESSES:
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UNITED STATES PATENT OFFICE.

WORTHINGTON HOOKER INGERSOLL, OF HAMBURG, NEW JERSEY.

BOILER-TUBE CLEANER.

SPECIFICATION forming part of Letters Patent No. 653,090, dated July 3, 1900.

Application filed April 17, 1900. Serial No. 13,268. (No model.)

To all whom it may concern:

Be it known that I, WORTHINGTON HOOKER INGERSOLL, a citizen of the United States, and a resident of Hamburg, in the county of Sussex and State of New Jersey, have invented new and useful Improvements in Boiler-Tube Cleaners, of which the following is a full, clear, and exact description.

My invention relates to devices for cleaning boiler tubes and flues by means of a steam-jet, and has for its object to provide a cleaner of the above-indicated class which will be particularly effective for cleaning large tubes or flues.

To this end my invention consists in the novel construction and arrangement of parts hereinafter described and claimed.

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

Figure 1 is a longitudinal sectional elevation of my improved cleaner applied to a boiler-flue with parts broken away. Fig. 2 is a cross-section on line 2 2 of Fig. 1; and Fig. 3 is a separate perspective view of the shell or air-drum, which forms a part of my cleaner.

The improved cleaner is provided with a suitable handle A, which is tubular, so as to allow steam to pass therethrough, the detail construction of the handle forming no part of my present invention. At the end of said handle A is secured the discharge head or nozzle B, which may be of any suitable construction, and, as shown, is a conical hollow body tapered toward the discharge end and provided in its interior with spiral ribs B' to give the steam-jet a twisting motion. So far the construction presents no features to which I lay claim in this application.

Around the head B, I place a shell or air-drum having a conical portion C spaced from the head, so as to form therewith an annular conical air-chamber D. At the forward end of said conical portion C, I provide an outwardly-projecting transverse disk or plate C', the outer edge of which is bent forward and inward, as shown at C². Forward of the disk C' and within the space inclosed by the flange C² is located another disk E, which is in contact with the head B, adjacent to its discharge end, so as to compel the air from the cham-

ber D to travel outward in the space D' between the disks C' and E. The outer edge E' of the disk E is bent parallel with the flange C², so as to form therewith an annular discharge-channel D², directed forward and inward. The conical portion C and disks C' and E may be connected with each other and with the head B in any suitable manner—for instance, by means of bolts F, connecting the two disks, and of bolts F', spacing the conical portion C from the head B.

In operation the flange C² is placed against the end of the flue G to be cleaned and steam is admitted through the pipe or handle A. The beveled flange C² will automatically center the cleaner relatively to the flue. The steam will be discharged with a twirling or eddying motion at the front end of the head B, and the jet will spread somewhat toward the walls of the flue. It will be obvious that the steam-jet will produce a suction which will cause air to be drawn into the flue through the chamber D, the space D', and the channel D². The air will therefore first pass in contact with the hot outer surface of the head B, and instead of being then thrown into the flue near the center thereof it is deflected outwardly in the space D' and finally discharged toward the center, near the periphery of the flue. I thus secure a plentiful supply and effective distribution of heated air, the more so as the air gets further heated in its passage along the disk or wall E, the inner surface of which is exposed to the steam within the flue G. The flue therefore becomes filled with the cleaning agent (a blast of steam and hot air) in its entire width, and the blast is very effective where it is needed most—that is, at the periphery, as the steam-jet is thrown in that direction.

By the above-described invention a relatively-small head may be used for cleaning tubes or flues of large diameter, and it becomes possible to keep but one standard size (or a few standard sizes) of head, which by the aid of various sizes of shells or air-drums may be applied to the cleaning of flues of different diameters. It will also be obvious from Fig. 1 that the shell or air-drum may be readily attached to existing cleaners of this type.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

1. A cleaner for tubes and flues, comprising a discharge nozzle or head tapered toward the discharge end, a tapering sleeve or air-drum surrounding said head and spaced therefrom, a transverse plate or disk extending outwardly from the narrow end of the sleeve, and another transverse plate or disk parallel with the first-named plate, and extending in advance of the narrow end of the sleeve, the space between said plates communicating with the air-space surrounding the head, and being open at the periphery.
2. A cleaner for tubes and flues, comprising a discharge nozzle or head, a sleeve or air-drum surrounding said head and spaced therefrom, and transverse plates or disks at the discharge end of the head, the space between said plates communicating with the air-space surrounding the head, and the outer portions of the plates having inwardly-bent flanges forming a discharge-channel between them.
3. A cleaner for tubes and flues, comprising a discharge nozzle or head, a sleeve or air-drum surrounding said head and spaced therefrom, a transverse plate or disk extend-

ing outwardly from the forward end of said sleeve and spaced from the head, another transverse plate or disk arranged in front of the first-named plate in contact with the head, the plates being spaced to form an air-chamber, said chamber being open at the periphery.

4. An attachment for tube and flue cleaners, comprising a sleeve and two spaced transverse plates or disks located at the front end thereof, one of said plates extending outwardly from the front end of the sleeve, and the other being in front of said end and having a central aperture.

5. An attachment for tube and flue cleaners, comprising a sleeve and two spaced transverse plates or disks located at the front end thereof, one of said plates extending outwardly from the front end of the sleeve, and the other being in front of said end and having a central aperture, the outer end of the rear plate having an inward flange.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WORTHINGTON HOOKER INGERSOLL.

Witnesses:

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