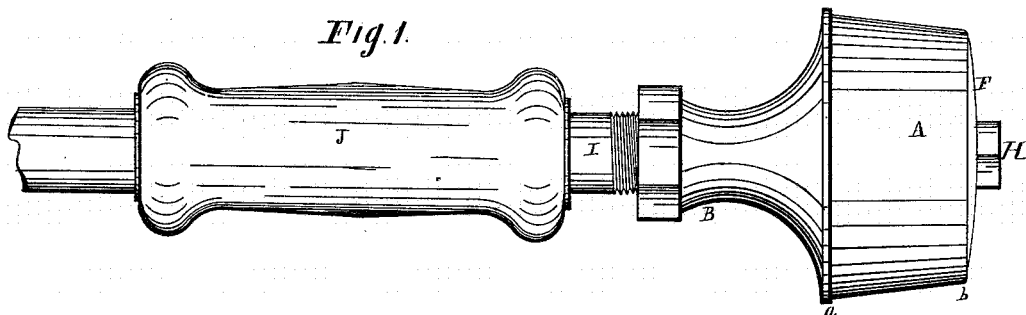


B. B. BURTON & L. LYNDE.  
Steam-Boiler Flue-Cleaners.

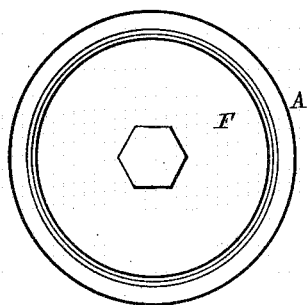
No. 220,959.

Patented Oct. 28, 1879.

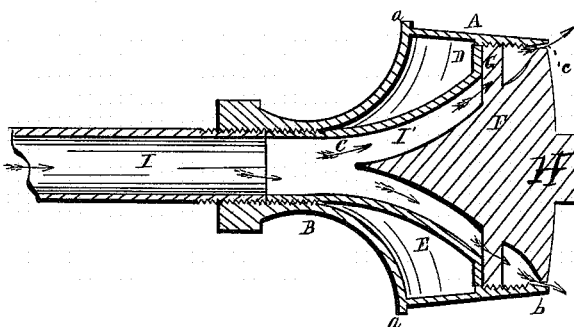
*Fig. 1.*



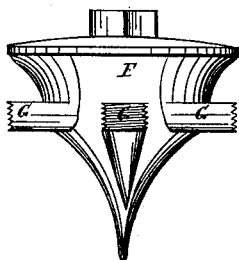
*Fig. 2.*



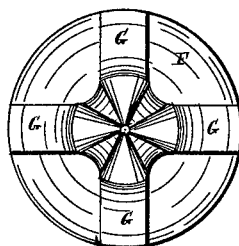
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



WITNESSES.

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# UNITED STATES PATENT OFFICE.

BYRON B. BURTON AND LEONARD LYNDE, OF CLEVELAND, OHIO; SAID  
BURTON ASSIGNOR TO JOHN J. WIGHTMAN, OF SAME PLACE.

## IMPROVEMENT IN STEAM-BOILER-FLUE CLEANERS.

Specification forming part of Letters Patent No. **220,959**, dated October 28, 1879; application filed  
May 26, 1879.

*To all whom it may concern:*

Be it known that we, BYRON B. BURTON and LEONARD LYNDE, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Steam-Boiler-Flue Cleaners, of which the following is a description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an external side view of the cleaner. Fig. 2 is an end view. Fig. 3 is a transverse longitudinal section. Fig. 4 is a side view of the cone. Fig. 5 is an end view of the same.

Like letters of reference refer to like parts in the several views.

This invention is an injector for cleaning boiler-flues by the use of steam, which is injected into the flues from a circular opening in the head of the injector, whereby the steam is applied directly to the sides of the flues for removing the soot, &c., adhering to them.

The said injector consists of an external cylindrical-shaped shell, having fitted therein a cone-shaped core, the outer end or head of which is a little less in diameter than the shell, so that between the shell and the core there is a narrow annular opening for the passage of steam; also, within the shell is fitted a funnel-shaped lining, surrounding the inner end of the conical core above alluded to, and through which the steam passes to and around the core to the annular opening, thence into the flue.

The construction and operation of the invention will be more fully understood by the following more complete description.

As shown in the drawings, A represents the shell above alluded to. Said shell tapers from the shoulder *a* to the end *b*, to adapt it to different size flues, into which it is inserted for injecting therein steam for cleaning them.

In the neck B of the shell is cut a thread, into which is screwed the smaller end of the funnel-form lining C. The upper edge or rim of the lining is provided with an annular flange, D, projecting so far from the rim as to fit closely the inside of the shell, whereas the part of the lining immediately below the flange is distant from the shell, thereby causing a space, E, between the shell and lining. The

purpose of the said lining will presently be shown.

On the inner side of the shell, above the lining, is cut a thread, into which is screwed the conical cone F, (detached views of which are shown in Figs. 4 and 5,) in which it will be seen that the core is provided with radial arms G, in the ends of which is cut a thread, whereby the core is screwed into the shell, as shown in Fig. 3.

It will be observed, on examination of the said Fig. 3, that the head H of the core does not touch the sides of the shell by which it is surrounded. A portion of the shell above the thread is chamfered off, thereby forming a narrow annular space or opening, *c*, between the head of the core and the side of the shell, as seen in said Fig. 3.

The lower end or point of the core projects into the neck of the lining, around which is ample room for steam to pass around the core to the annular opening *c*.

Into the outer end of the neck of the shell is screwed a section of pipe, I, whereby the injector is handled by grasping the wooden shield J when in practical use.

As above said, this invention is for cleaning the flues of steam-boilers. To this end the injector, by means of the pipe I, is attached to the steam-boiler by a flexible tube. The head or shell A is then inserted in the end of the flue, and from the tapering form of the head it can be made to fit tightly therein.

The steam issuing from the boiler through the flexible tube and the pipe I passes through the injector, as indicated by the arrows, into the flue. The steam therein causes a relaxation of the soot from the sides of the flue, and the impelling force of the steam drives it out of the opposite end.

The steam issues from the injector in an annular form and close to the side of the flue. Therefore it acts directly or endwise upon the incrustation of the flue, forcing it from the sides and out therefrom, thereby cleaning it.

The purpose of the lining C is to prevent the steam from spreading into the corners E of the shell, which, if permitted to do so, would form eddies, and obstruct and break the force of the steam in its way through the injector

to the flues. By allowing the steam to pass through the space I' in nearly a direct line its effect upon the flue is more forcible and effective in cleaning them.

The conical shape of the core divides the steam, causing an equal amount of pressure thereof on all sides of the core, so that its issue from the injector through the annular opening *c* will be equally effective on all the inner surface of the flue.

In the event there should be any reaction of the steam, causing it to return around the shell, it is prevented from contact with the hand grasping the shield J by the shoulder *a*, which deflects the steam from the hand, and preventing it from being burned, thereby making the handling of the injector quite safe.

What we claim as our invention, and desire to secure by Letters Patent, is—

In a flue-cleaner, the combination, with the shell A and the outwardly-flaring lining C, the smaller end of which is screwed into the neck of the shell A, and the larger end fitting against the interior surface thereof, of the cone F, provided with lugs or arms G, substantially as set forth.

BYRON B. BURTON.  
LEONARD LYNDE.

Witnesses:

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J. H. BURRIDGE.