

(No Model.)

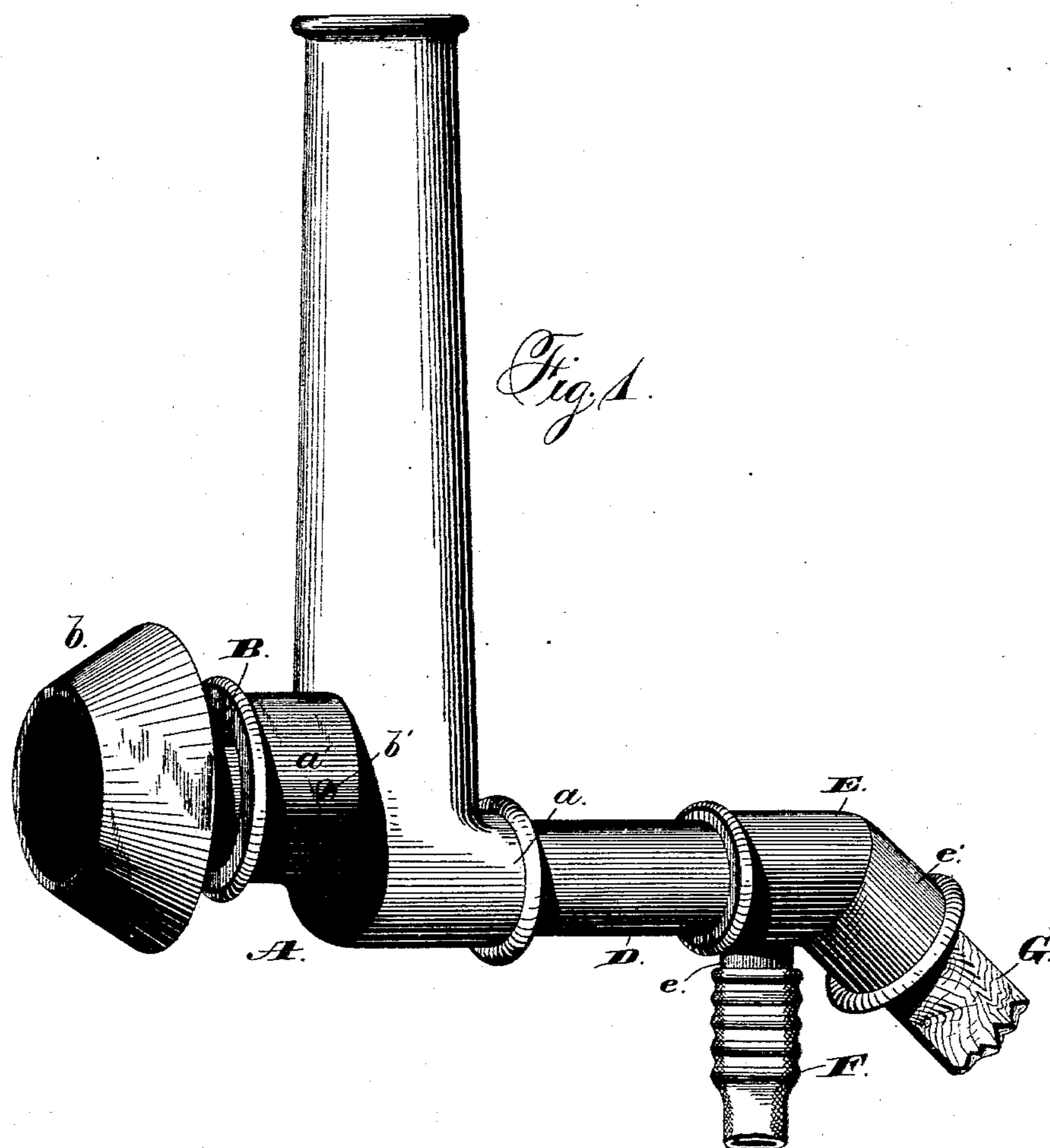
2 Sheets—Sheet 1.

W. H. COOPER.

FLUE CLEANER FOR STEAM BOILERS.

No. 315,738.

Patented Apr. 14, 1885.



Witnesses:  
Jas. C. Hutchinson.  
Henry C. Hazard.

Inventor.  
Wm. H. Cooper, by  
Pindle & Russell, his Attys

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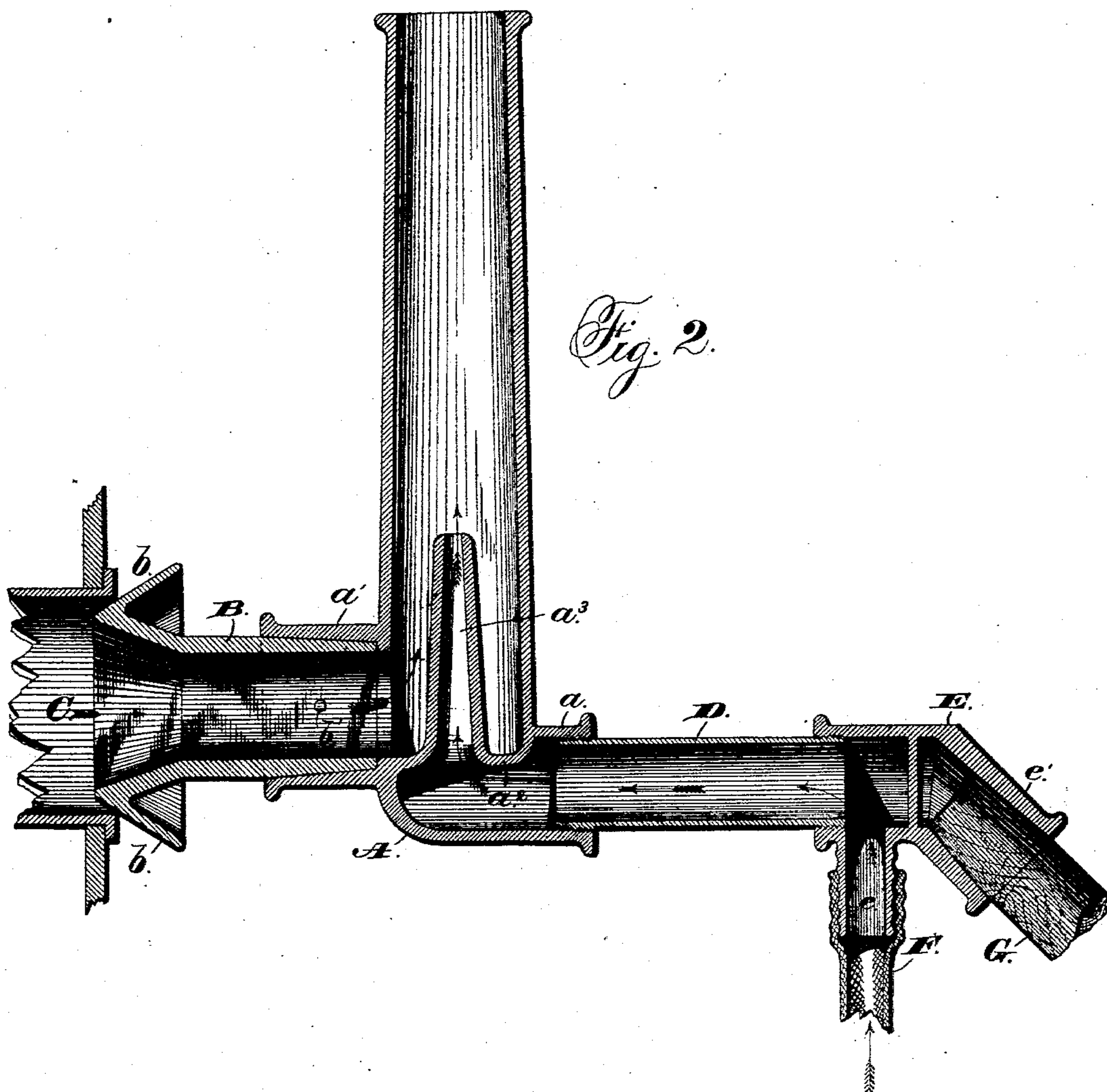
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# UNITED STATES PATENT OFFICE.

WILLIAM H. COOPER, OF QUINCY, ILLINOIS.

## FLUE-CLEANER FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 315,738, dated April 14, 1885.

Application filed December 18, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. COOPER, of Quincy, in the county of Adams, and in the State of Illinois, have invented certain new and useful Improvements in Flue-Cleaners for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my device, and Fig. 2 is a central longitudinal section of the same.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to enable boiler-flues to be easily and thoroughly cleaned from soot and ashes, to which end said invention consists in the construction of the apparatus whereby a jet of steam is enabled to dislodge and remove obstructions from within a flue, substantially as and for the purpose hereinafter specified.

In the annexed drawings, A represents the body of my device, which is constructed from cast metal, and consists of a hollow cylinder that is open at its upper end and closed at its lower end, and at points at and slightly above the latter is provided with two laterally-extending branch pipes, *a* and *a'*, respectively, which are arranged upon opposite sides of said body.

From a point upon a line with the lower side of the opening *a'* a diaphragm, *a<sup>2</sup>*, extends horizontally across the interior of the body A, and at its center is provided with a jet-pipe, *a<sup>3</sup>*, that extends axially upward within said body and decreases in diameter from its lower end to its upper end. Said diaphragm operates to divide the interior of said body into two parts, the upper of which parts communicates directly with said branch *a'*, while the lower part of said interior communicates directly with the branch *a*, and through said jet-pipe *a<sup>3</sup>* with said upper part.

Fitted into the branch *a'*, which is preferably slightly tapering, is a nozzle, B, that at its inner end corresponds to and closely fills said branch, and at its outer end has interiorly a sharp rearward and outward flare, and exteriorly has a forwardly and outwardly projecting flange, *b*, such construction giving to

the outer end of said nozzle a conical form, which adapts it to fit into and close the end of a flue, C, that has an interior diameter less than the largest diameter and greater than the smallest diameter of said flanged end. Said nozzle is preferably held in place within said branch pipe by means of a radial screw, *b'*, but may be screwed therein by any desired means which will permit of its ready insertion to or removal from position.

Within the branch *a* is fitted one end of a short pipe, D, preferably wrought or rolled metal, which is secured therein in any well-known manner, while upon the opposite end of said pipe is secured an L-fitting, E, that is adapted to receive upon its vertical branch *e* the end of a flexible hose, F. From the outer side of said fitting a socket, *e'*, projects downward and outward, and receives one end of a wooden bar, G, by means of which the apparatus is handled by the operator.

The apparatus thus constructed is used as follows, viz: The hose F being connected with a steam-supply, the tapering outer end of the nozzle B is placed within the end of a flue, C, after which steam is permitted to enter, and, escaping from the jet-pipe *a<sup>3</sup>*, forces the air contained within the body A upward and outward, so as to create therein a partial vacuum. Air to supply such vacuum flows through said flue C with a velocity which is governed by the pressure and volume of the steam passing through the apparatus, and by such air-current all soot, ashes, or other like substances within said flue are loosened and carried into and ejected from said body A, such operation requiring but a fraction of the time that would be necessary for cleaning said flue by use of scrapers or other like mechanism.

The capacity of the apparatus is rendered sufficient for flues having largely different diameters by providing several nozzles having different sizes, and changing the same to suit the flues being operated upon.

Having thus described my invention, what I claim is—

1. The apparatus for cleaning flues, consisting of a hollow cylinder provided with an axially-located jet-pipe, and means, substantially as shown, for connecting the same with a steam-supply, and a branch pipe or nozzle which ex-

tends laterally outward from said body, and is adapted at its outer end to fit within the end of a flue, so as to connect such flue with the interior of said body, substantially as specified.

2. In combination with the body provided with the axially-located steam-jet pipe, and the laterally-arranged branch pipe, the nozzle adapted at its outer end to fit within the end of a flue, and at its inner end to fit into said branch pipe, and means whereby the latter and said nozzle may be secured together, substantially as and for the purpose shown.

3. The apparatus described for cleaning flues, consisting of the cylindrical body having an open upper end, and provided with the horizontal diaphragm and axially-arranged

jet-pipe, and with the laterally-projecting branch pipes, the nozzle adapted at one end to fit within a flue, and at its opposite end to fit within the upper branch pipe, the L-shaped fitting adapted to receive a handle, and to have connected therewith a flexible hose, and the pipe extending between and operating to connect said fitting with the lower branch pipe of said body, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 13th day of December, A. D. 1884.

WILLIAM H. COOPER.

Witnesses:

EZRA BEST,

MOSES F. BASSETT.