

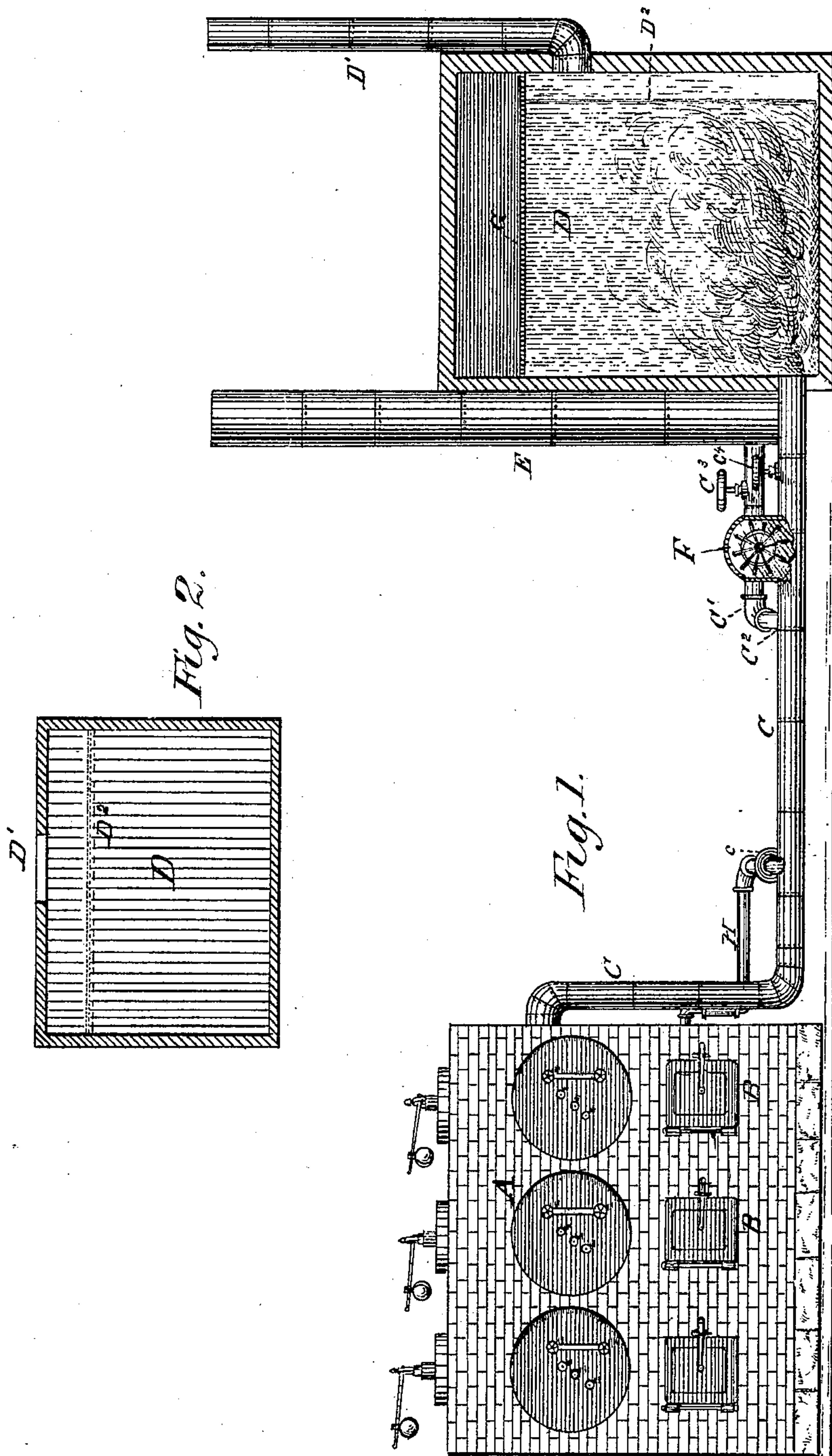
(No Model.)

W. CHISHOLM.

APPARATUS FOR CONSUMING SMOKE.

No. 245,278.

Patented Aug. 9, 1881.



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR CONSUMING SMOKE.

SPECIFICATION forming part of Letters Patent No. 245,278, dated August 9, 1881.

Application filed April 26, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM CHISHOLM, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and  
5 useful Improvements in Apparatus for Consuming Smoke; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to  
10 make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an apparatus for the disposition of the unconsumed combustible  
15 elements of smoke arising from burning any kind of coal, condensing the same, and adapting the product to be used as a fuel, and in mechanism for carrying out my process.

In the drawings, Figure 1 is a view, in elevation, of suitable mechanism for carrying out  
20 my process. Fig. 2 is a plan view of the chamber D.

In the drawings, A represents a boiler set in an arch having its fire-box B beneath it.  
25 With this fire-box is connected a flue, C, through which all the products of combustion carried in the smoke pass. This pipe C is connected directly with a closed chamber, D, of any suitable size or shape. C' represents a supplemental pipe, which taps the main flue C at C<sup>2</sup>.  
30 This pipe C' is provided with a damper or valve, C<sup>3</sup>, which may be opened or closed at will. This pipe C' is connected with any suitable chimney, as E. The object of this supplemental pipe is to permit a ready draft when  
35 the fires in the fire-box B are being started.

C<sup>4</sup> is a valve or damper in the pipe C, between the fire-box B and the room D. This valve or damper may be closed at will, and when closed  
40 the damper C<sup>3</sup> is opened, so as to permit the free passage of the smoke from the fire-box to the chimney or stack E, a short or low stack only being necessary. Any suitable fan or exhaust, F, may be placed at any point upon the main  
45 conduit C, between the damper C<sup>3</sup> and room D. The object of this fan or exhaust is to induce a draft through the pipe C and force the products of combustion into the chamber D. This chamber D is provided with a perforated  
50 ceiling, G, through which water may readily pass and drop to the floor in the shape of fine streams or spray, carrying with it the sooty

products of combustion. This may be operated and controlled by any suitable mechanism, but in itself does not constitute any portion of my  
55 invention. At one side of this chamber D may be placed an opening, D', through which any smoke or gases that are not condensed by the operation of the water may be allowed to pass  
60 into the stack or open air. If found necessary to arrest all of the unconsumed combustible matter in the smoke, there may be interposed between the main portion of the chamber D and this opening a water curtain, consisting of  
65 a narrow or thin film of water, through which the smoke must be forced to pass before reaching the flue D' or open air. At c in the main flue C an opening may be made and a small  
70 pipe introduced to permit the escape of the lighter, or, perhaps, explosive, gases. I would also provide a return-flue, H, provided with a funnel-shaped mouth, through which the gases  
75 escaping from the pipe c may be returned to the fire-box B and there consumed.

Having thus described the mechanism necessary for carrying out my process, its operation  
75 is as follows: Fires may be started in the fire-box B, the valve C<sup>4</sup> closed, the valve C<sup>3</sup> opened. The products of combustion will now pass through the pipe C to the junction C<sup>2</sup>. From  
80 thence through the supplemental pipe C' into the chimney or stack E. After the fire is sufficiently under headway the damper or valve C<sup>3</sup> may be closed and the valve C<sup>4</sup> opened. Now the products of combustion pass directly through  
85 the flue C to the chamber D. The water is now turned on. The constant falling spray from the ceiling into the room will condense and convey to the bottom of the room the carbon  
90 and other condensible parts which were unconsumed in the furnace. This product may be gathered in the shape and consistency of mortar and dried, or pressed into shape and then dried, as may be preferred. If thought  
95 desirable, fine or slack coal may be mixed with it before shaping or drying. It may then be returned to the furnace as fuel. If any of the gases are incapable of being condensed they  
100 will pass through the water film, (indicated in Fig. 2) by the line D<sup>2</sup> to the flue D', and from thence to the chimney; or they may be discharged directly into the open air without  
passing into the chimney at all.

To assist in drawing the smoke from the fire-

box B through the pipe C to the chamber D, I would place between the chamber and the damper C<sup>4</sup> a covered exhaust or pump, and run it at a sufficient speed to create a vacuum and draw the smoke from the fire-box B into and through the pipe or conduit C into the chamber.

The water need not be wasted, as it can be pumped to the boilers or used for any other purposes.

10 What I claim is—

1. The combination, with a furnace, of the pipe C, chamber D, and water-distributor G, the return-pipe H, and valves C<sup>3</sup> C<sup>4</sup>, substantially as set forth.

15 2. The combination, with a furnace, of the

pipe C, chamber D, water-distributor G, pipe C', valves C<sup>3</sup> C<sup>4</sup>, and fan F, substantially as set forth.

3. The combination, with a furnace, of the pipe C, chamber D, water-distributor G, chim- 2c neys E D', pipe C', and valves C<sup>3</sup> C<sup>4</sup>, substantially as set forth.

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

WILLIAM CHISHOLM.

Witnesses:

JNO. CROWELL, Jr.,  
ALBERT E. LYNCH.