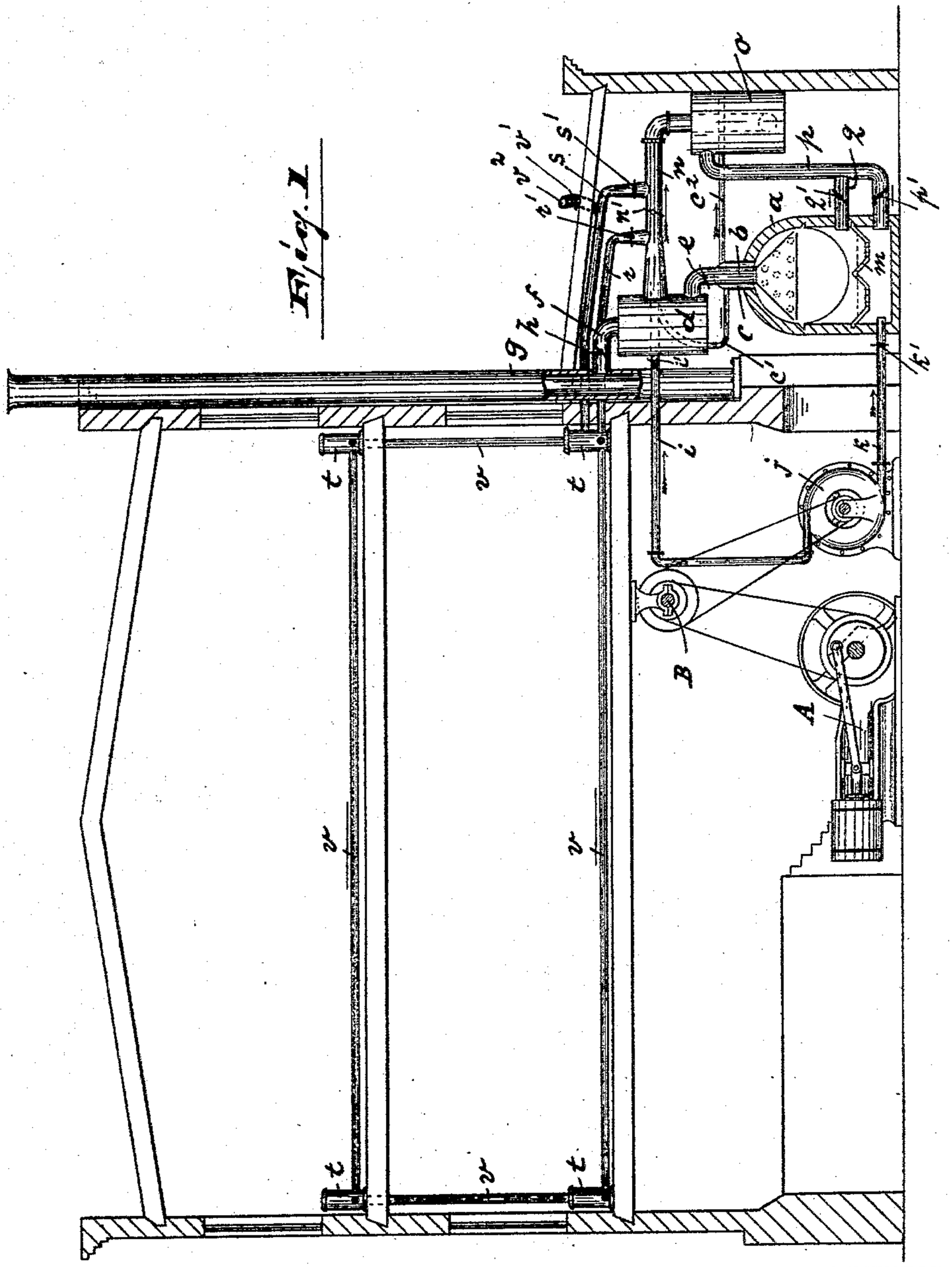
(No Model.) 3 Sheets—Sheet 1.

G. W. POOLE.

HEATING AND SMOKE CONSUMING APPARATUS.

No. 515,718. Patented Feb. 27, 1894.

Fig. 1.



WITNESSES:

Wm. D. Bell.

O. M. Robertson.

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(No Model.) 3 Sheets—Sheet 2.

G. W. POOLE.

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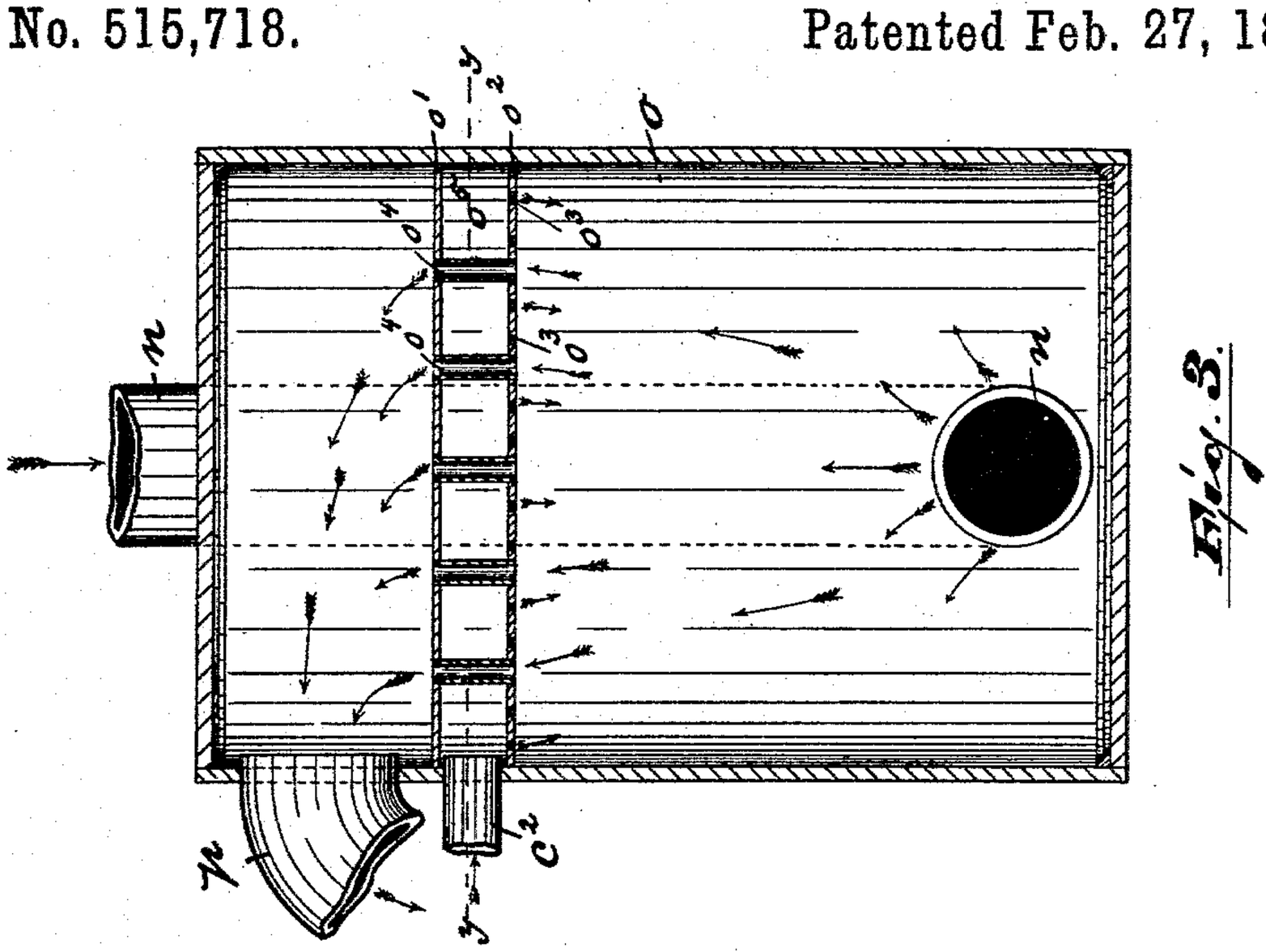

Fig. 3.

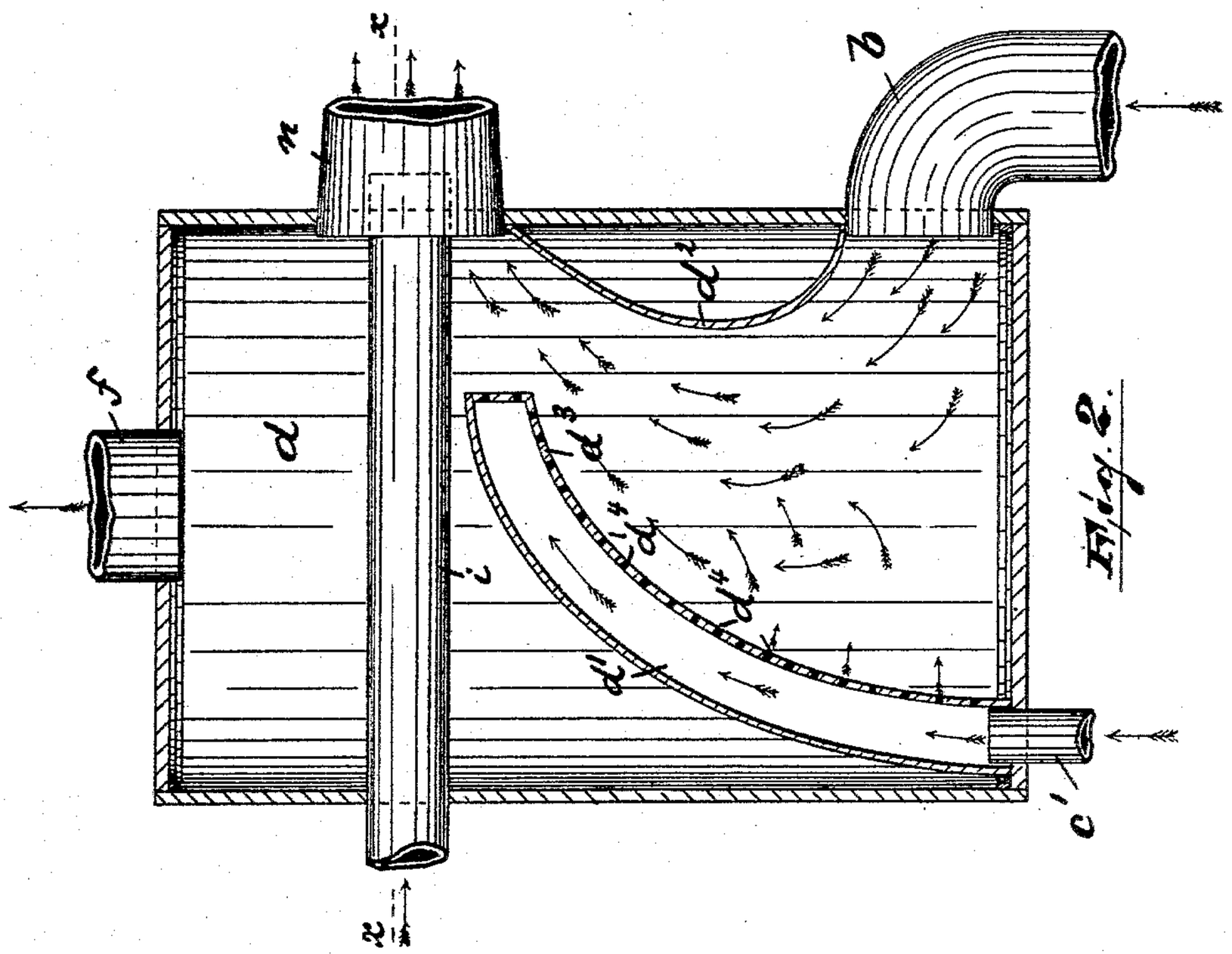

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

G. W. POOLE.

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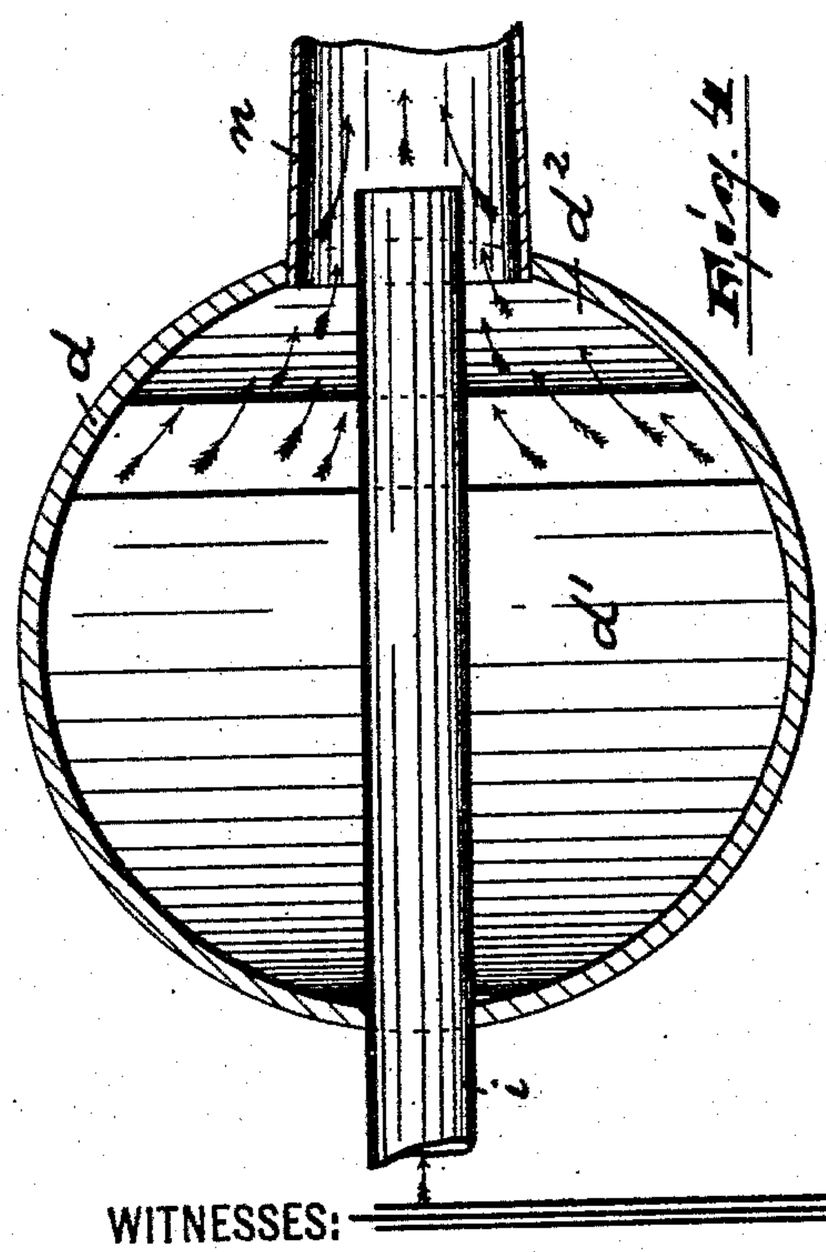

Fig. 4.

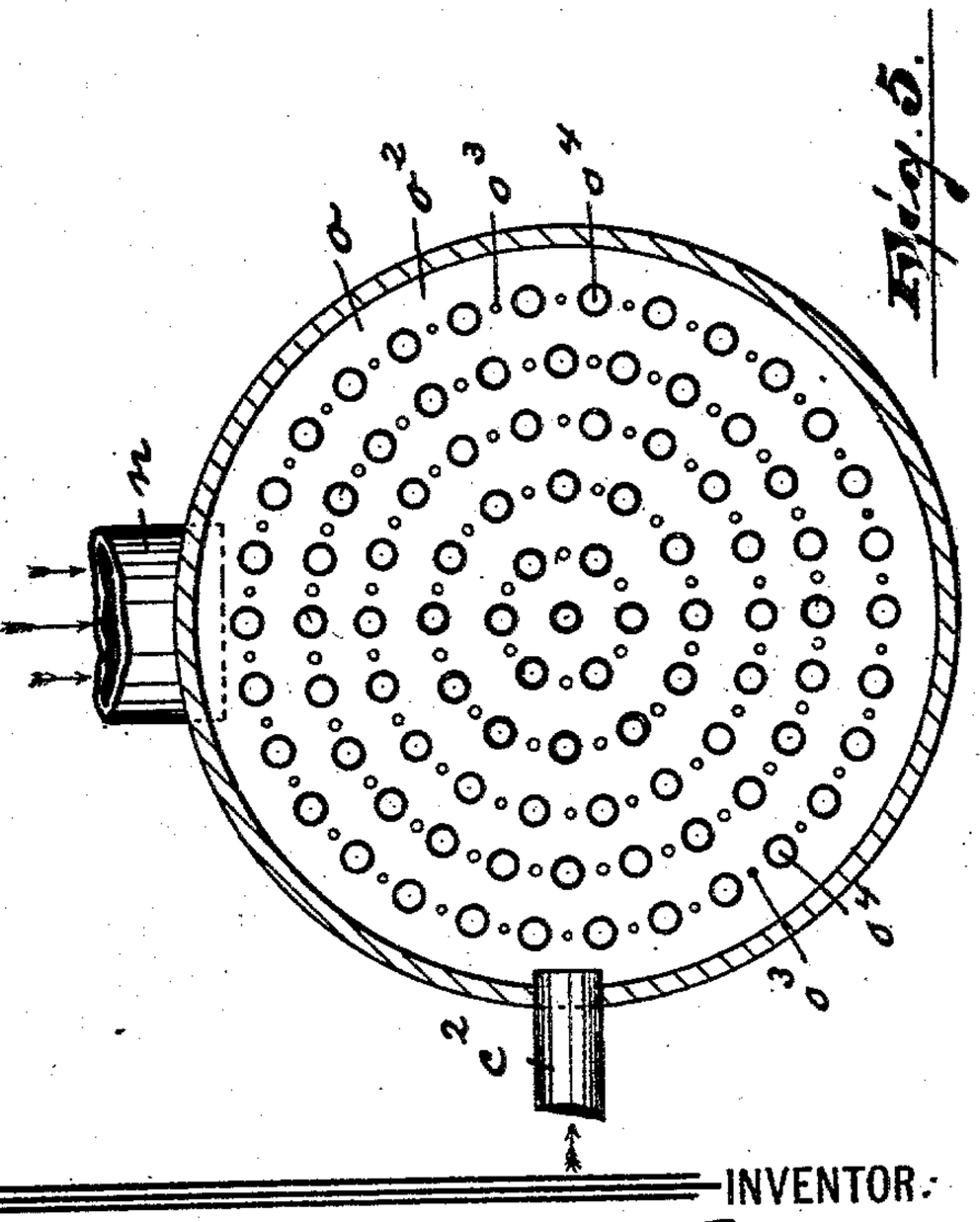

Fig. 5.

WITNESSES:
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O. M. Robertson

INVENTOR:
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UNITED STATES PATENT OFFICE.

GARRETT WALLACE POOLE, OF NEWARK, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NEW JERSEY BLOWER COMPANY, OF SAME PLACE.

HEATING AND SMOKE-CONSUMING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 515,718, dated February 27, 1894.

Application filed May 16, 1893. Serial No. 474,418. (No model.)

To all whom it may concern:

Be it known that I, GARRETT WALLACE POOLE, a citizen of the United States, residing in Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Heating, Ventilating, and Smoke-Consuming Apparatus; 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to a new and useful improvement in combined heating, and smoke consuming apparatus, and it consists in the combination and arrangement of parts and details hereinafter set forth and claimed.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the interior of a building and of my approved apparatus in position. Fig. 2, is an enlarged side elevation partly sectioned of the chamber designed to receive the unpurified smoke from the furnace. Fig. 3 is a similar view of the chamber in which the smoke is purified. Fig. 4 is a cross section taken on the line x—x of Fig. 2; and Fig. 5 is a cross section taken on the line y—y of Fig. 3.

In said drawings A represents an engine of usual construction, communicating motion through shaft B and pulleys to a fan or blower J. At one side of the engine A is arranged the furnace a, within which an ordinary boiler is placed. Leading from the dome of the furnace a is the fuel or smoke pipe b provided with a damper e. This smoke pipe b enters a chamber d and smoke leaves said chamber d through pipe f provided with damper h, which pipe f enters the usual chimney g (see Fig. 1). The blower j is provided with two outlet pipes i and k, the lower one (k) of which enters the furnace a beneath the grate bar m thereof, and is provided with a damper k'. The upper pipe i is provided with a damper i' and extends through the chamber d into the funnel shaped pipe n, which has an opening into said chamber d. This pipe n is provided with a damper n' and enters a chamber o, preferably at the lower end thereof. From said chamber o leads a pipe p into the furnace a below the grate m, while a branch tube q enters said furnace above said grate, as clearly shown in Fig. 1 of the drawings. Said pipes p and q are provided with dampers p' and q' respectively.

From the pipe n and on either side of its damper n' lead the pipes r and s, provided with dampers r' and s' respectively. These pipes r and s are respectively the inlet and outlet pipes to and from a system of heating pipes v and radiators t. The pipe s has an outlet v^2 into the open air, provided with a damper v', see Fig. 1.

Leading from the steam dome c of the boiler is a pipe c', which terminates inside the chambers d in a semi-dome shaped case d' the under wall d^3 of which is perforated as at d^4 (see Fig. 2). Arranged on the side of the chamber d above the mouth of pipe b is a deflecting plate d^2 for the purpose hereinafter described. Also leading from said steam dome c is another steam pipe c^2 entering the chamber o and terminating in a cylindrical chamber o^5, having an upper wall o' and a lower wall o^2. The lower wall is perforated by minute orifices o^3. This chamber o^5 separates the chamber o into two compartments, and is placed below the mouth of pipe p (see Fig. 3). Communication between the two compartments of chamber o is effected by tubes o^4 extending through the walls o' o^2 and the entire chamber o^5.

In operation, when the apparatus is to be used for smoke consuming, the dampers i', n', e and q' are opened, while the dampers r', s', p' and k' are closed. The damper h is opened wholly or partly as may be necessary to allow excess of smoke from the furnace to escape into the chimney g. In this position smoke from the furnace a ascends into chambers d, wherein it is sprayed by minute jets of steam from orifices d^4 of the semi dome shaped chamber d', and in this chamber d the smoke is deflected by plate d^2 toward the wall d^3 and toward the outlet pipe n. Air is now forced into the funnel shaped end of pipe n from the blower j through pipe i (damper i' being open) and the suction thus produced in

pipe n serves to draw in the sprayed smoke from the chamber d. The air and smoke is then forced through pipe m (dampers r' and s' being closed and n' open) into the chamber o below the cylindrical partition o^5. The compartment below said partition o^5 is preferably filled or partly filled with sawdust (not shown) or similar matters, through which the air and smoke are strained. In this compartment the combined air and smoke are sprayed by steam from the orifices o^3 in the under wall o^2 of the partition o^5, and the sprayed air and smoke are then forced through the tubes o^4 into the upper compartment from whence it enters the pipe p. The combined air and smoke is then forced through pipe q (damper q' being open and damper p' closed) into the fire chamber above the grate m, where it is consumed.

The products of combustion can be utilized for heating purposes, in which case the dampers i', e, r', s', and p' are all opened to their full extent, while the dampers n' and q' are closed. The damper h is opened to an extent only to allow an excess of smoke to escape from the furnace. Supposing the dampers are in the position above described, air is forced from the blower j through pipe i into pipe n where it mingles with the hot air of chamber d which comes from the furnace, by reason of the well known siphon action in said tube n. The damper n' being closed and damper r' open, the heated air is next forced through pipe r into the heating pipes v and radiators t within the building. From the building the heated air passes through pipe s (damper s' being open) into the tube n on the other side of the damper n'. The spent hot air is then forced through chamber o and through pipe p below the grate and serves to increase the blast or draft. When an increased blast is required the damper k' may be opened wholly or partly, and air directly from blower j, fed below the grate m.

It is manifest that with proper regulation of the various dampers both heating and smoke consuming may be performed at the same time by my apparatus.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a smoke consuming apparatus, the combination of a furnace, and the steam dome of its boiler a chamber adapted to receive the smoke from said furnace, a blower and siphon adapted to suck the smoke from said chamber and to combine the same with air in the siphon, with a system of pipes leading from said siphon to the fire place of the furnace, and with a pipe leading from the steam dome to said chamber, all arranged so that the combined air and smoke after the latter has been sprayed with steam in the said chamber is forced from said chamber through the siphon to the fire place of the furnace, and above and below its grate bar substantially as described.

2. In a smoke-consuming apparatus the combination of a furnace, and the steam dome of its boiler a chamber adapted to receive the smoke from said furnace a blower and siphon adapted to suck the smoke from said chamber and combine it with air in the siphon, with a purifying chamber in communication with said siphon a system of pipes leading from said purifying chamber to the fire-place of the furnace, and a pipe leading from said steam dome to the said purifying chamber, all arranged so that the combined air and smoke in the siphon is forced through the purifying chamber and from thence after being sprayed with steam to the fire-place of the furnace, and above and below its grate bar substantially as described.

3. In a smoke consuming apparatus, a chamber interposed between the furnace and its chimney and provided with a steam spraying wall adapted to spray the smoke in said chamber and a deflecting wall adapted to deflect the smoke toward said steam spraying wall and toward the outlet of the chamber, substantially as described.

4. In a smoke consuming apparatus, a purifying chamber for combined smoke and air, consisting of an upper and lower compartment separated by a cylindrical hollow partition in communication with a steam chest said cylindrical partition having on its under face a series of minute orifices and being perforated with a series of tubes forming a communication between the two compartments substantially as described.

5. In a smoke consuming apparatus, the combination of a furnace and the steam dome of its boiler, a chamber adapted to receive the smoke from said furnace, a blower and siphon adapted to suck the smoke from said chamber and to combine the same with air in the siphon, with a purifying chamber in communication with said siphon, a system of pipes leading from said purifying chamber to the fire place of the furnace, a pipe leading from the steam dome to the chamber and a pipe leading from said steam dome to the purifying chamber, all arranged so that the smoke after being sprayed with steam in the chamber is combined with air in the siphon, and is forced through the purifying chamber, (where it is again sprayed with steam) into the fire place of the furnace, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 19th day of April, 1893.

GARRETT WALLACE POOLE.

Witnesses:

ALFRED GARTNER,

HENRY E. EVERDING.