

J. R. WALLS.
Heating and Ventilating Stoves.

No. 199,672.

Patented Jan. 29, 1878.

Fig. 1.

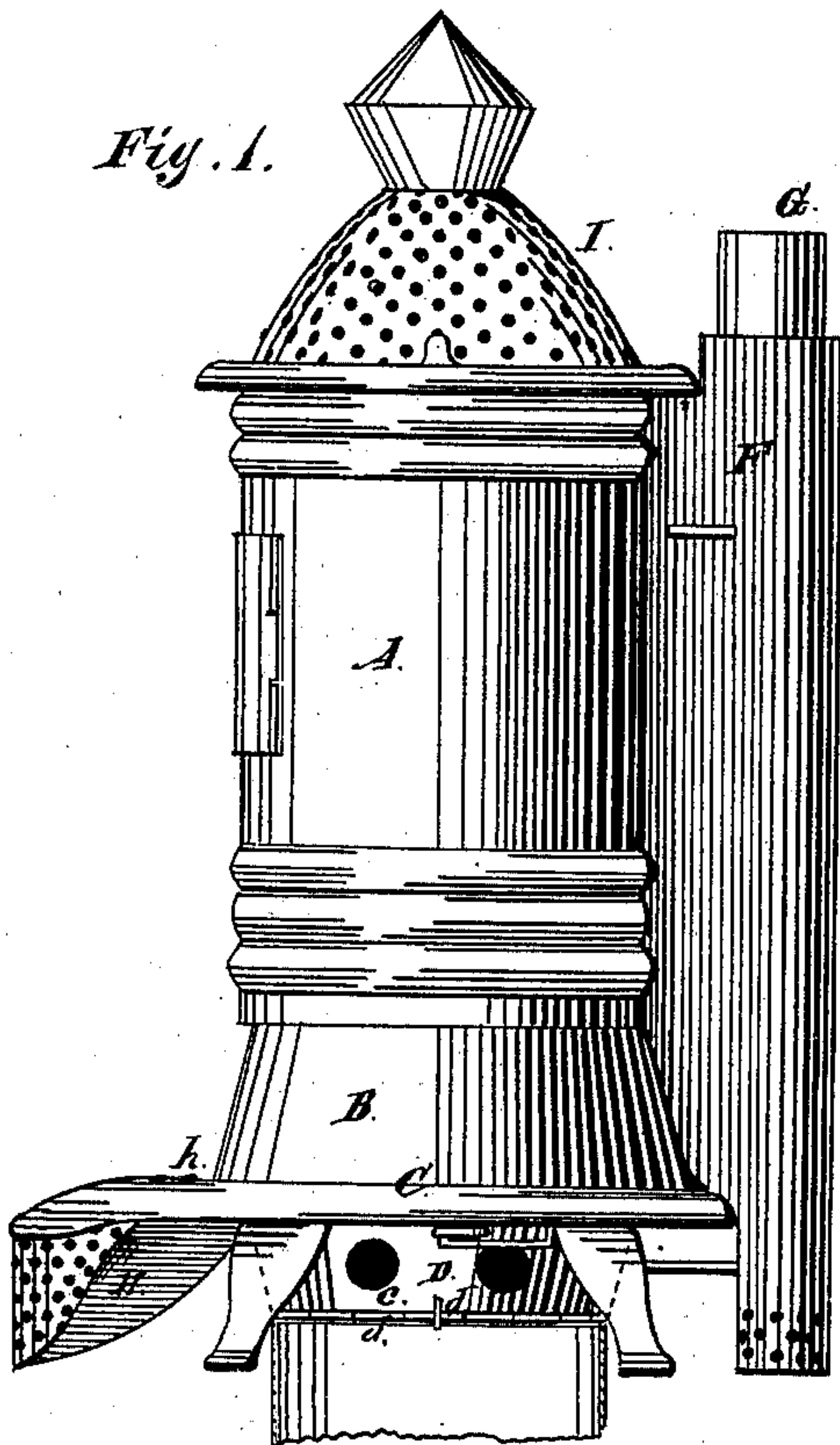


Fig. 3.

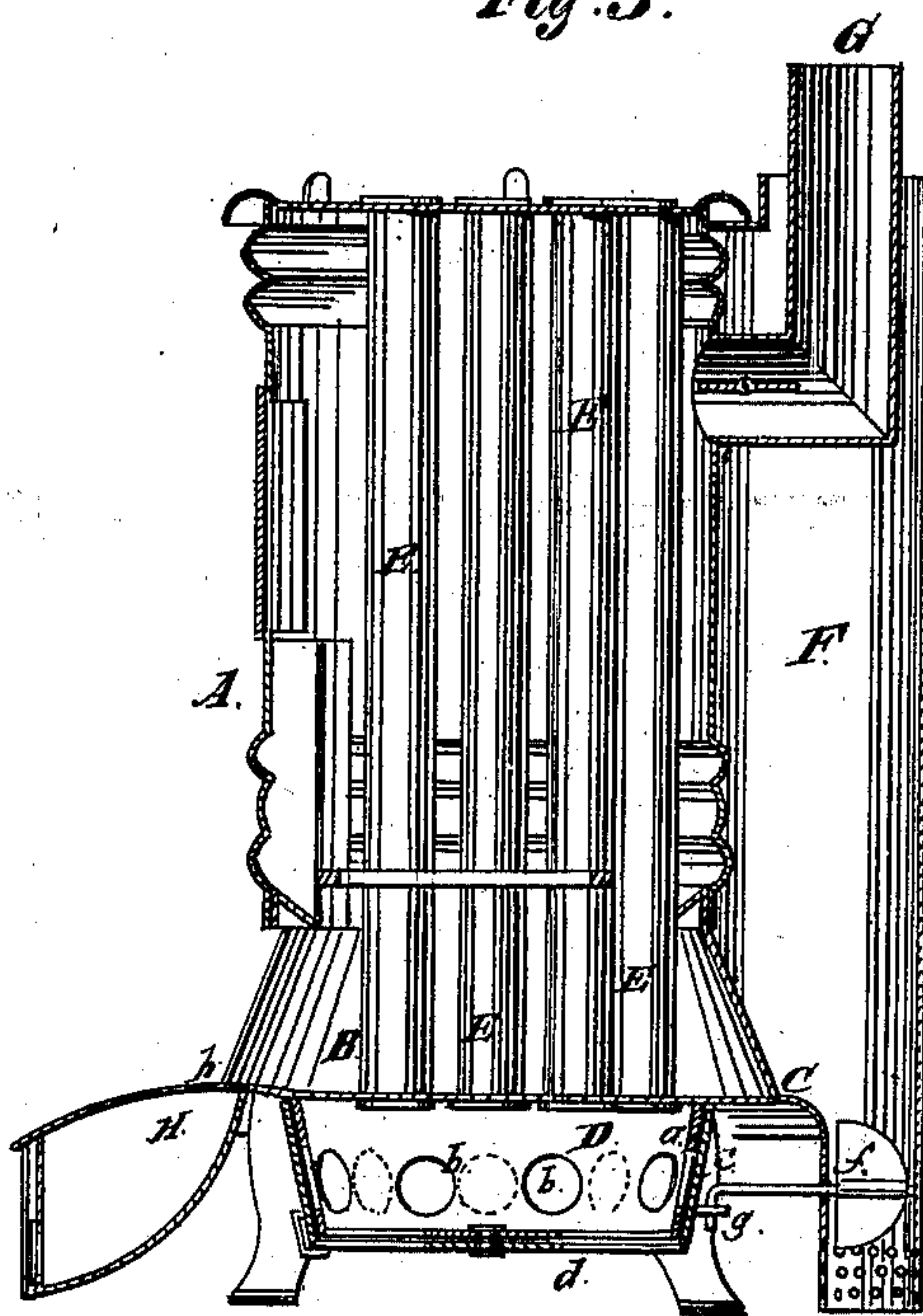
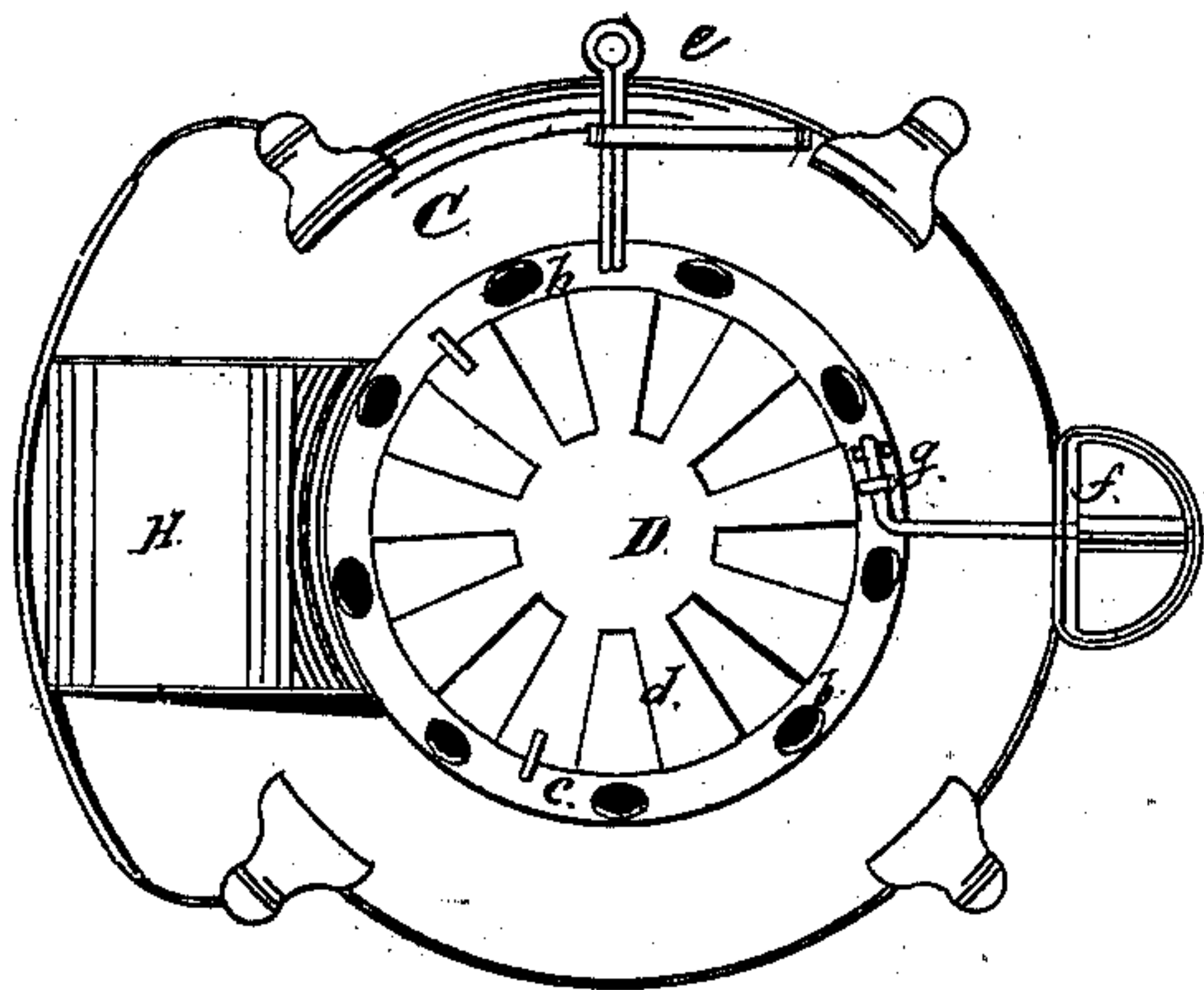


Fig. 2.



Witnesses:

Heinrich A. Bruns.
L. M. Harris

James R. Walls, Inventor.

By Coburn & Thacher, Attys.

UNITED STATES PATENT OFFICE.

JAMES R. WALLS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN HEATING AND VENTILATING STOVES.

Specification forming part of Letters Patent No. **199,672**, dated January 29, 1878; application filed March 6, 1876.

To all whom it may concern:

Be it known that I, JAMES R. WALLS, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Heating and Ventilating Stoves, which is fully described in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the stove. Fig. 2 is a plan view of the bottom of the stove; Fig. 3, a vertical central section from front to rear.

The object of my invention is to provide a ventilating-stove for use in school-rooms, halls, and other large assembly-rooms, by means of which the air may be evenly heated throughout the room.

The invention consists in several special devices and combinations of devices, all of which will be hereinafter fully set forth.

In the drawings, A represents the main body of the stove, below which is the ash-pit B. C is the bottom of the stove, to which is attached an air-chamber, D. The side *a* of this chamber has a series of holes, *b*, in it, and the bottom is slotted radially. An annular plate, *c*, is fitted loosely around the outside of this receiver, which also has a series of holes corresponding to those in the side of the chamber.

A radial valve or damper, *d*, is pivoted to the bottom of the receiver, and connected to the annulus *c*, as shown in Fig. 2, so as to be turned with it, and to the latter is attached a handle, *e*, extending out below the bottom of the stove, by means of which the valves are turned.

Pipes E are fitted in the bottom of the stove, opening into the air-chamber, and pass up through the interior of the stove and out at the top thereof, in which their upper ends are fitted. The pipes have spaces between them, so that the fire within may also heat the outside casing.

The bottom of the chamber D is intended to be connected with a flue leading to the open air, so that when the bottom valve is open fresh air will be admitted directly to the chamber from outdoors.

The bottom valve and the annular or side valve are so arranged with relation to each

other that when one is open the other is closed, and therefore, when air is received into the chamber directly from the outside of the building, none enters from the room. If, however, the handle is moved so as to close the bottom valve, the side valve will be rotated, so as to admit air through the side apertures from the room into the chamber.

A large pipe, F, is attached to the back of the stove, which surrounds the smoke-pipe G, and extends down to the floor, being perforated at its lower end to admit the foul air at the bottom of the room. This pipe is carried up around the smoke-pipe until it enters the chimney-flue, into which it opens. The smoke-pipe heats the air in this ventilating-pipe sufficiently to cause it to rise, and thereby a current is created from near the floor of the room through this duct into the chimney, and thus the foul air and noxious gases, which fall to the bottom of a room, are carried off.

A valve, *f*, is attached to a shaft which has its bearings in the sides of the ventilating-pipe F. One end of the shaft projects inward toward the stove, is bent down, and passes between two pins attached to the side valve, as seen at *g*.

The rotation of the valve *c* will therefore open and close the valve *f* by the action of the pins against the bent end of the valve-shaft. The parts are so arranged that when communication between the chamber and the fresh-air flue is open the valve *f* is open also; but when communication is opened from the room into the chamber, the valve *f* is closed. The valve *f* may, however, be disconnected from the valve *c*, if desired.

At the front of the stove and below the bottom a depressed air-passage, H, is constructed, which leads from the floor to the opening into the ash-pit by means of perforations in the bottom of the stove at *h*, just above the upper end of the passage, and directly in front of said opening. This constitutes a supplementary draft-duct for the fire, and also acts as a ventilator by conducting the foul air from the bottom of the room directly into the fire. This passage may be controlled by suitable valves.

The top of the stove is surmounted by a suitable cover, I, which is perforated, so as to

permit the air coming up through the pipes E to pass out into the room.

It will be seen that in the construction described above the fire will be in immediate contact with the circulating-pipes E, which construction will answer with a wood-fire. If, however, coal is used, the pipes will not stand the intense heat of the mass of ignited fuel; and for a coal-stove the construction should, therefore, be modified, so as to protect the pipes from the direct action of the fire by suitable partition-plates.

The operation of my invention is as follows: When the fire is kindled within the stove the surrounding pipes E become heated, thereby raising the temperature of the air within the pipes, and causing it to rise and pass into the room from the top of the stove. The pipes, however, being provided with a receiver or air-supply chamber, continuous currents through the pipes E will be created, and thus the room furnished with a constant supply of fresh air warmed by its passage through heated pipes. When the fire is first kindled and the room is cold it may be desirable to close for a time the communication between the receiver and the open-air flue, in which case a circulation of the air in the room is produced by its passage from the floor through the heated pipes to the ceiling, by which the air in the room will be sufficiently warmed and the temperature equalized throughout. The valves or dampers are then changed, so as to open communication with the cold-air flue, which is properly warmed during its passage through the pipes, and so the proper temperature of the room maintained. At the same time the valve at the lower end of the ventilating-pipe is opened, and, as heretofore described, the foul air at the bottom of the room is drawn off into the chimney. This ventilation of the room is also assisted by de-

pressing the draft-flue of the stove, so that its entrance is nearly on a level with the floor.

By this system of heating and ventilating rooms a comparatively pure atmosphere is obtained, and an equable temperature throughout the room.

It is evident that this heating apparatus may be used to warm rooms on different floors by simply attaching to the top of the stove a suitable receiver and conducting-pipe, to form a communication between the pipes E and the room above. Where the apartment in which the heater stands is not too large this plan may be adopted with success, for the stove itself radiates a large amount of heat from it bodily in the ordinary way.

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

1. The ventilating and auxiliary draft-flue H, arranged underneath the hearth, and extending from the floor of the room to the front of the ash-pit, substantially as and for the purpose set forth.

2. The ventilating-pipe F, constructed without openings into the room, except at the lower end, and extending from the floor of the room to the chimney-flue, in combination with the smoke-pipe G inclosed therein, substantially as and for the purpose set forth.

3. The combination of the ventilating-pipe F and the regulating-damper *f*, substantially as and for the purpose set forth.

4. The combination of the ventilating-pipe F, damper *f*, and annular damper *c* connected thereto, substantially as and for the purpose set forth.

JAMES R. WALLS.

Witnesses:

L. A. BUNTING,

HEINRICH F. BRUNS.