No. 617,805. Patented Jan. 17, 1899.

R. H. BURNS.

SMOKE PREVENTING APPARATUS.

(Application filed Aug. 16, 1898.)

(No Model.)

Fig. 1.

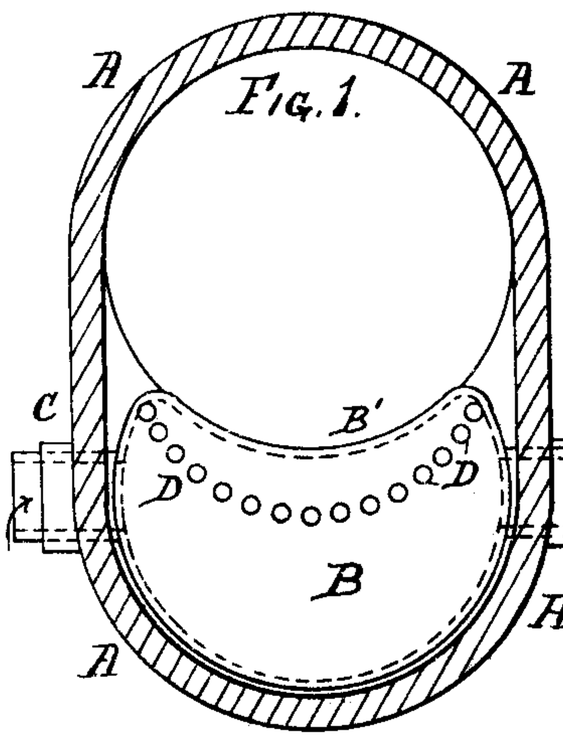


Fig. 2.

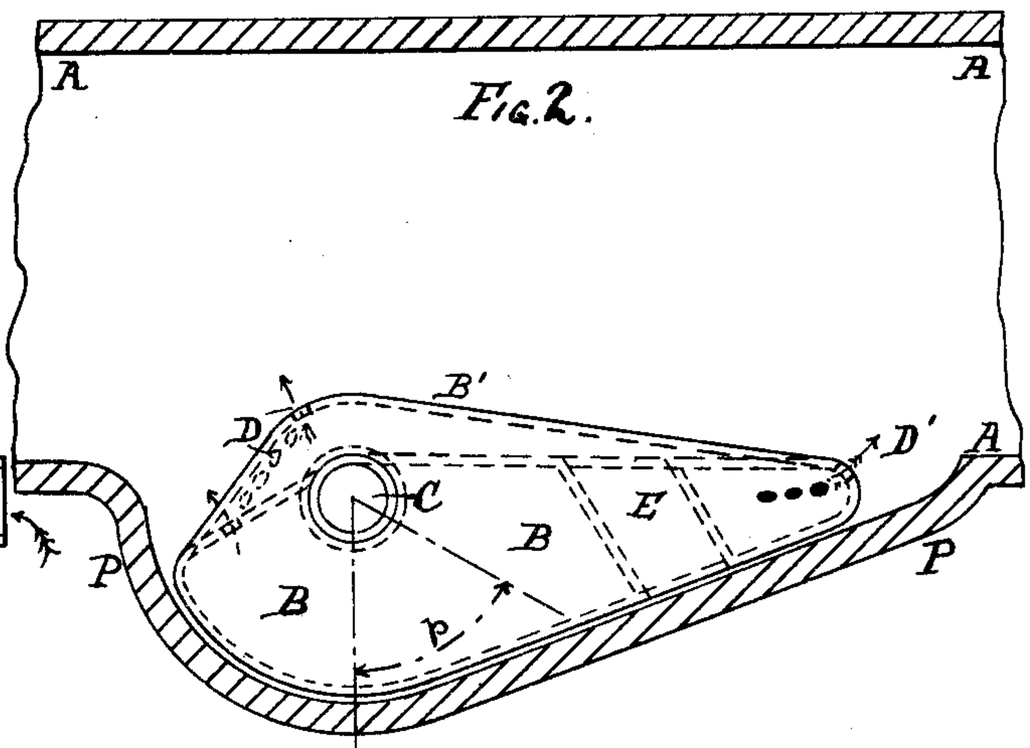


Fig. 3.

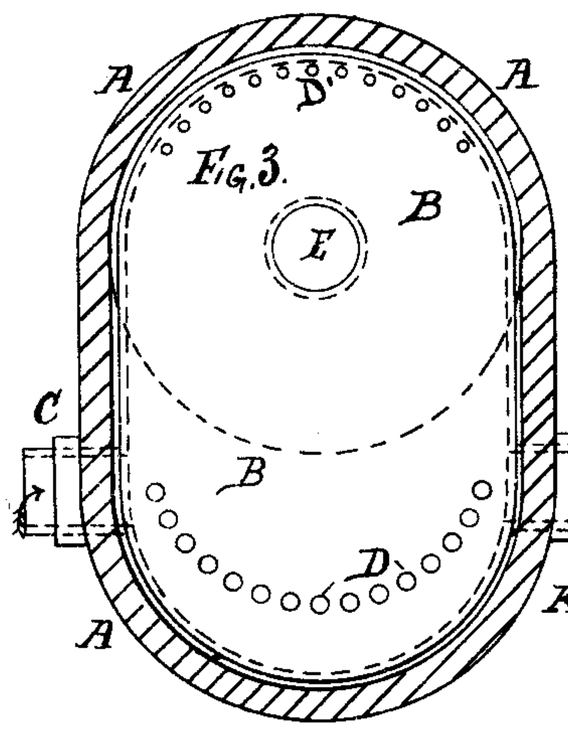


Fig. 4.

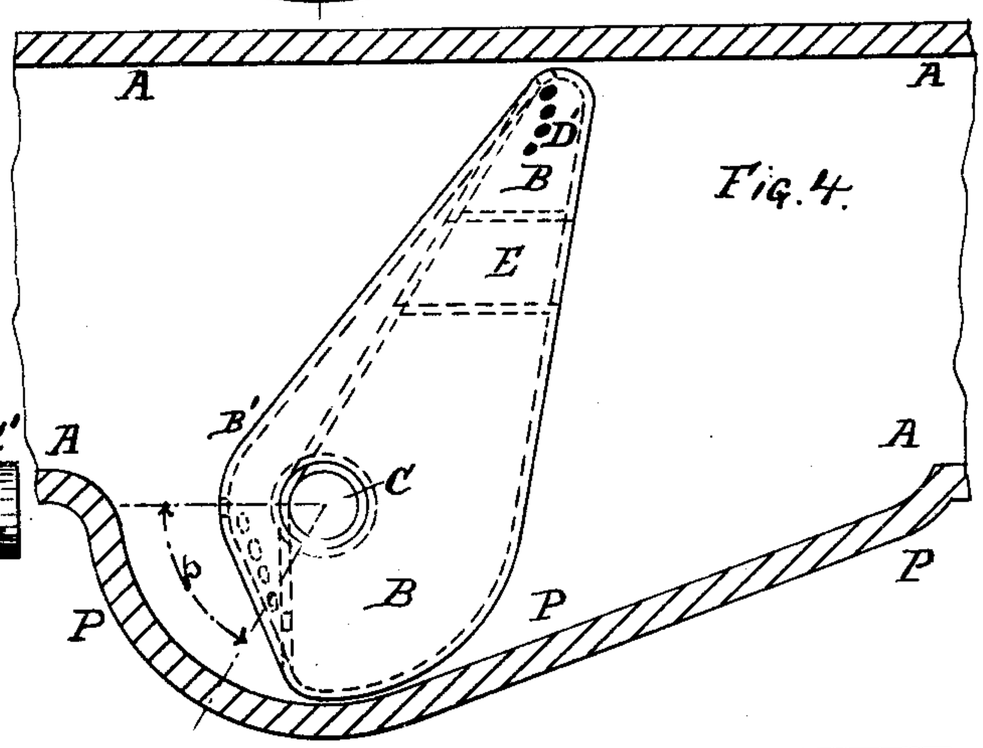


Fig. 5

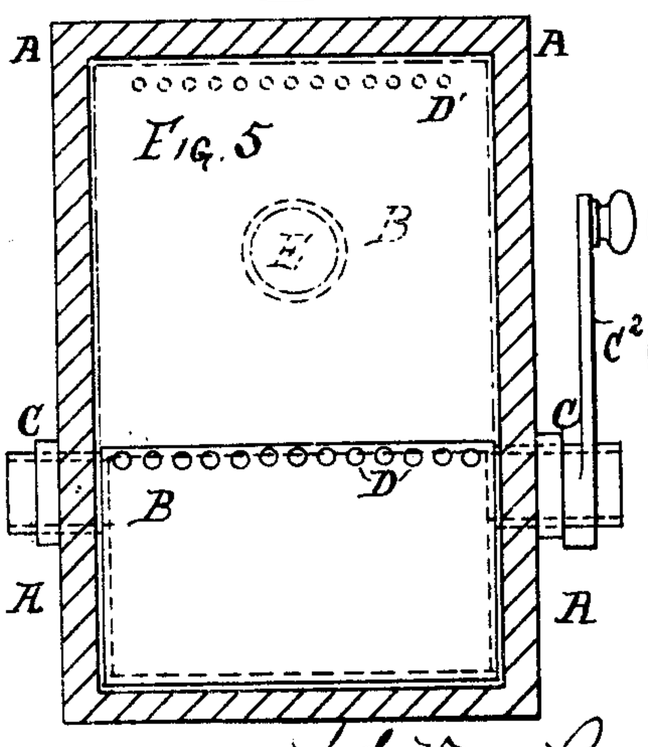
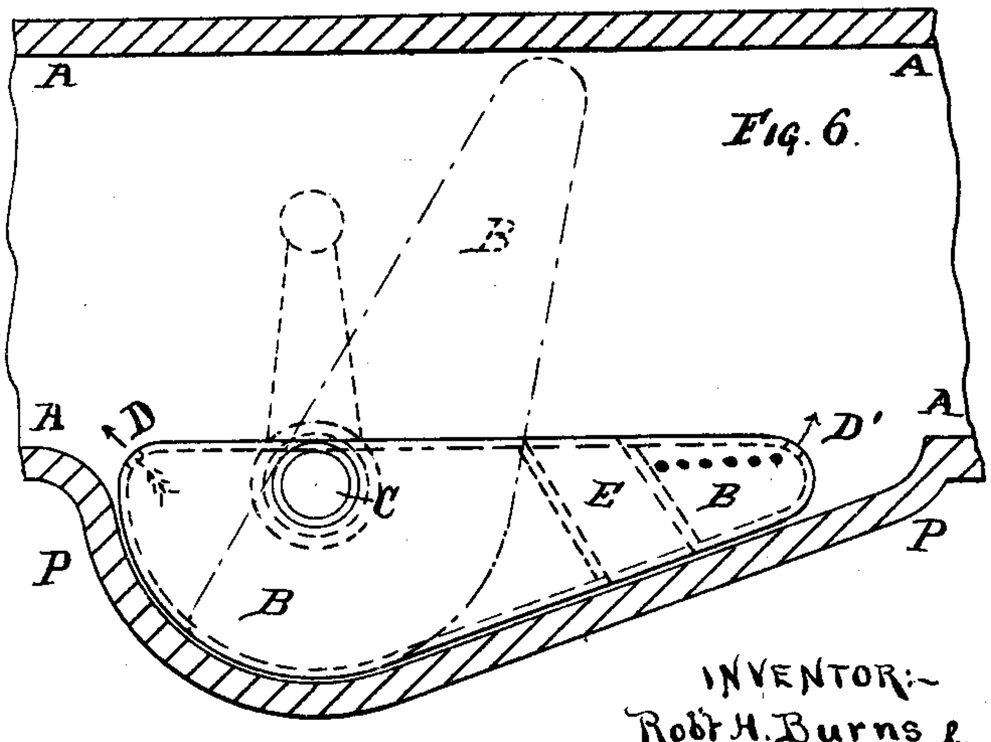


Fig. 6.



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INVENTOR:-
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Wm H. Weightman
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UNITED STATES PATENT OFFICE.

ROBERT H. BURNS, OF NEW YORK, N. Y.

SMOKE-PREVENTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 617,805, dated January 17, 1899.

Application filed August 16, 1898. Serial No. 688,733. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. BURNS, a citizen of the United States, residing in New York city, county of Kings, and State of New York, have invented certain new and useful Improvements in Smoke-Preventing Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to a special means for introducing a new air or combustion effecting and assisting medium into the chimney flue or flues of a furnace or combustion-chamber, whereby an antagonistic impingement and a resultant-heating and mingling of the admitted medium with the furnace-gases is effected, causing an increased and more efficient combination of the fuel and its gases.

My improvements consist in the insertion within a chimney-flue of a hollow revolving chamber riding upon trunnions made tubular on one or both sides for the admission of the combustion effecting or assisting medium to said revolving chamber. This revolving chamber is supplied with holes or perforations to secure a scattered exit or discharge of the contained medium either by means of applied force, expansion-pressure, or ordinary circulation. The revolving chamber is preferably located in as close proximity to the furnace or combustion-chamber as possible, so that the combustion effecting or assisting medium may the more readily reach the gases to be consumed and secure their complete combustion as near the point of best use as possible.

For an economical and complete combustion of fuel and its gases in a heating, evaporating, and like apparatus it is essential and necessary that as much heat as possible shall pass from the fire and combustion to the heating, evaporating, or work to be done. It is likewise essential and necessary that a certain quantity of the manufactured heat shall pass out through the flue and chimney for draft purposes. If, now, a sufficient and final combustion of any spare or unburned gases is provided for and secured within the flue and close to the other combustion through a new and independent supply of the combustion effecting and assisting medium, a maximum efficiency will have been provided for and attained, since a greater quantity of heat has been passed to the heating or evaporating plant and the flue-combustion has furnished the heat for chimney circulation and discharge.

Referring to the accompanying drawings, Figures 1 and 2 represent transverse and longitudinal sections of a chimney-flue embodying my improvements, the flue being represented as open. Figs. 3 and 4 represent the same, the flue being represented as closed. Figs. 5 and 6 represent a square flue supplied with my improvements, the full lines showing the flue open, the dotted lines showing it closed.

Similar letters of reference designate like parts or portions in all the figures.

Letter A designates the flue in section.

B designates a hollow revolving chamber or compartment adapted to contain and discharge the air or combustion effecting or assisting medium.

C designates the trunnions upon which chamber B revolves or swings and through which the air or combustion effecting or assisting medium is admitted or forced into chamber B, within which when in service it becomes completely or partially heated, according to the speed at which it passes through.

Letter D designates exit-holes or perforations at the larger end, and D′ designates holes or perforations at the smaller end, of chamber B, as illustrated. Through these holes or perforations the combustion effecting or assisting medium is scattered or passed to mingle with the gases from the fuel for increased combustion.

C′ designates a cap or like means for closing the tubular trunnions to prevent or stay the admission of the combustion effecting or assisting medium to chamber B. When outside air is admitted, it may be closed by placing caps C′ over the ends of the trunnions. When pressure or the combustion effecting or assisting medium is made use of, a valve of any well-known type will be necessary.

C^2 designates an operating lever or handle to open or close the flue.

E designates a vent hole or passage for flue-ventilation when the furnace is not in use or when a slow fire is desired or when the fires are banked.

Letter *p* indicates the angle of movement

to swing the chamber B to a full opening or closing of the flue.

P designates a flue-pocket into which chamber B swings to open the flue. Should the flue be of ample size, this pocket P need not be provided, the chamber B resting and revolving within the immediate and direct line of the flue.

In the operation of the device the combustion effecting or assisting medium is admitted or forced into chamber B through trunnions C and passes out through holes D at large end or holes D' at the small end, or through both, according to necessity or desire. When the combustion effecting or assisting medium passes out through the holes or perforations D, it comes into immediate and direct and antagonistic contact with and impinges upon the fire or furnace gases, resulting in an immediate and more efficient combustion and result. When the medium passes out through the perforations D', it mingles with gases of combustion more slowly and moving in the same direction assists them mechanically to a more speedy exit. When the draft of chimney is good, there will be no necessity for holes or perforations D' and they should be omitted. These holes or perforations D or D' may of course be located at any portion of chamber B. They, however, act more efficiently at the ends, as shown.

The flue side of chamber B is preferably made concave, as shown, when used in connection with round flues. The chamber B is made in form and shape best suitable to that of the flue in which it is to be used. It is not essential that it shall be large at one end and small at the other, but only that the chamber shall be sufficiently large to carry the required combustion effecting or assisting medium.

When the flue is not in use for heating purposes, air may be permitted to pass into chamber B and out through the holes or perforations and thence through the ventilating-passage E for flue and chimney ventilation.

When a minimum combustion in slow-fire practice is desired, chamber B is revolved to fill the flue, its periphery being in closed contact with the inner surface of the flue, the combustion-assisting medium passing out through holes or perforations D at the furnace end of chamber B in a direction toward the furnace, meeting, impinging upon, and mingling with its unconsumed gases or combustion, thereby effecting a resultant combustion of the same.

The combustion effecting or assisting medium may be, as preferred, atmospheric air, assisting gases, atomized petroleum, or the like.

A damper of ordinary or preferred make may be inserted within the flue or chimney beyond and outside of the combustion-effecting chamber B for ordinary and usual purposes.

What I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a furnace or chimney flue, an inclosed chamber, the periphery of which is made to conform to the inner surface of said flue and make closed contact therewith, tubular inlet-trunnions upon which said chamber revolves, and exit holes or perforations, as and for the purposes set forth.

2. In combination with a chimney-flue, an inclosed revolving chamber adapted in shape to permit of a complete opening and closing of the flue, tubular trunnions upon which it revolves, exit holes or perforations in the walls of said chamber, and a ventilating-passage through said chamber, substantially as and for the purposes set forth.

3. In combination with a furnace or chimney flue, an inclosed chamber, the periphery of which is made to conform to and make closed contact with the inner surface of said flue, tubular inlet-trunnions upon which said chamber revolves, and exit holes or perforations located at the furnace end of said chamber, as and for the purposes set forth.

4. In combination with a furnace or chimney flue, an inclosed chamber, the periphery of which is made to conform to and make closed contact with the inner surface of said flue, tubular inlet-trunnions upon which said chamber revolves, exit holes or perforations in the walls of said chamber, a vent or passage through said chamber, and a pocket into which said chamber may revolve as and for the purposes set forth.

ROBERT H. BURNS.

Witnesses:
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WM. H. WEIGHTMAN.