

(No Model.)

3 Sheets—Sheet 1.

A. W. MORTON.
GAS STOVE OR HEATER.

No. 248,875.

Patented Nov. 1, 1881.

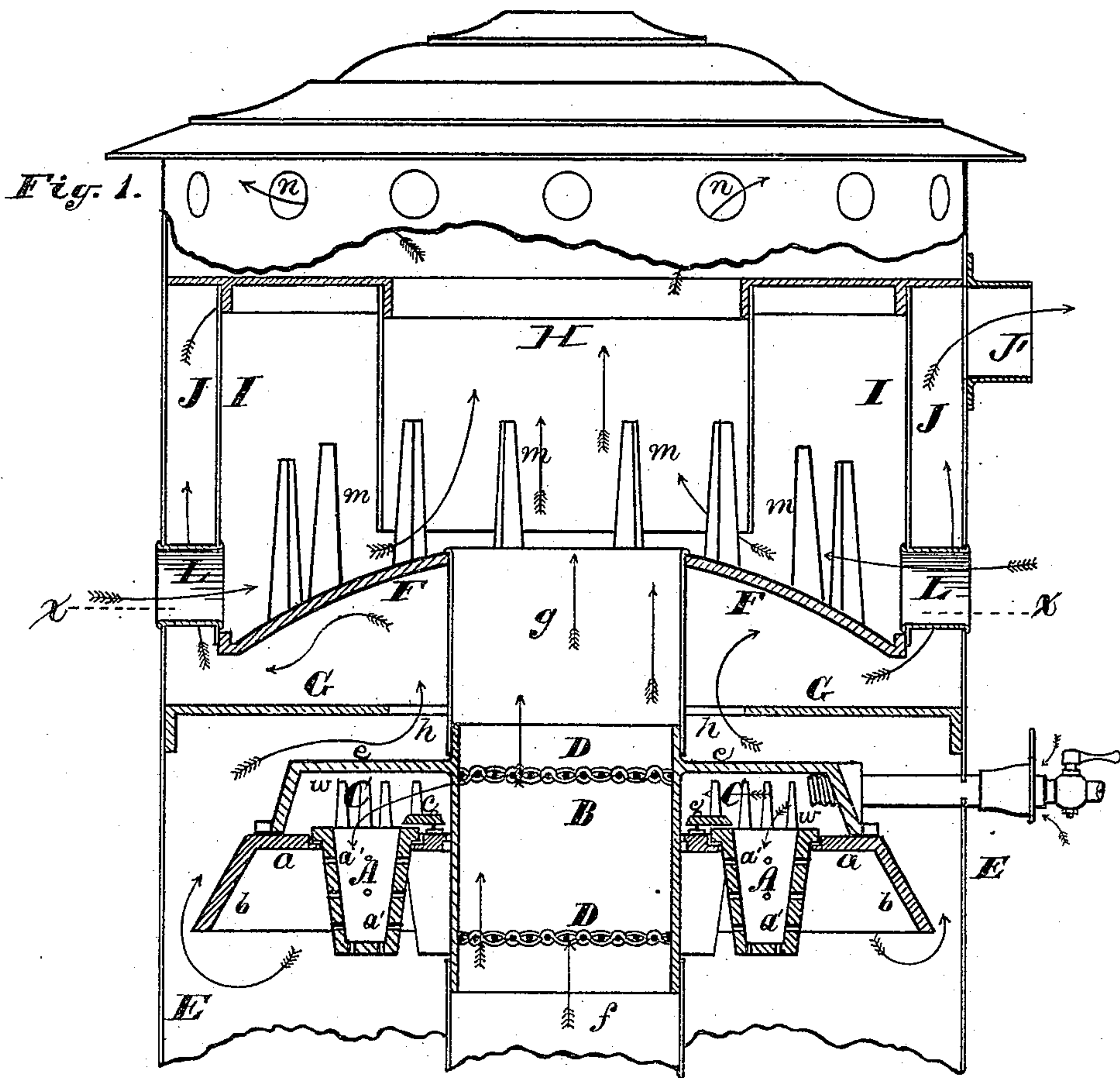
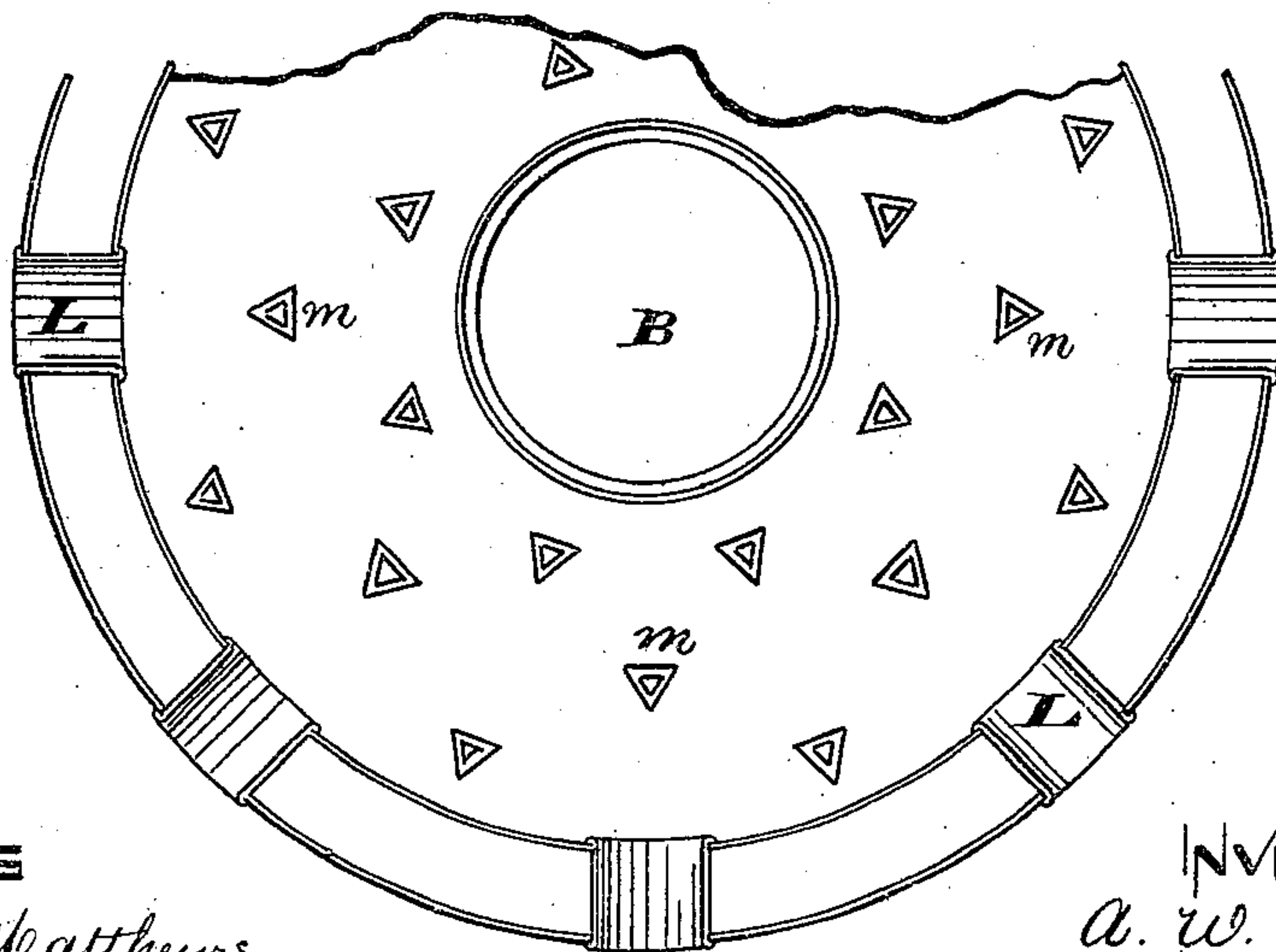


Fig. 2.



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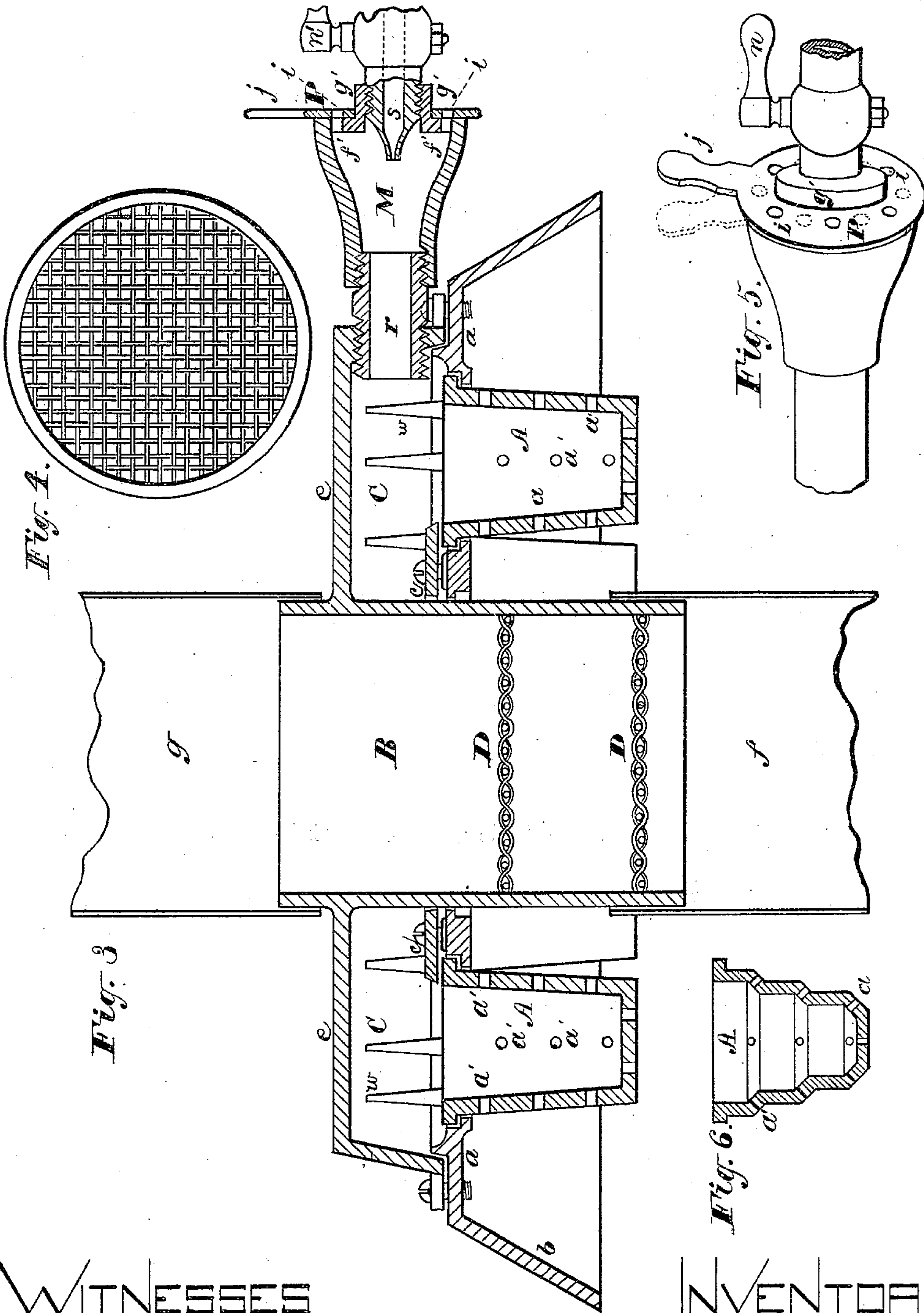
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Fig. 7.

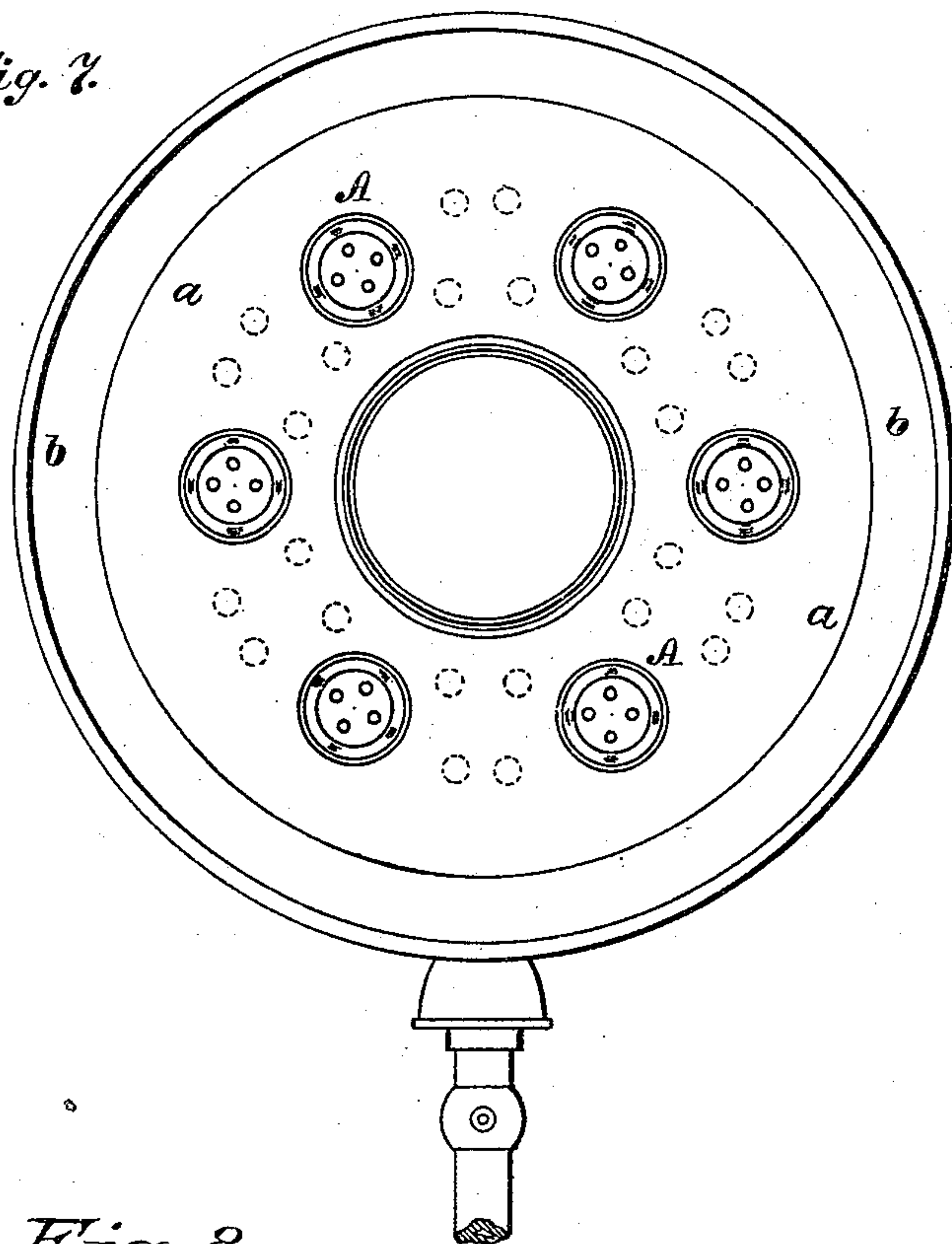
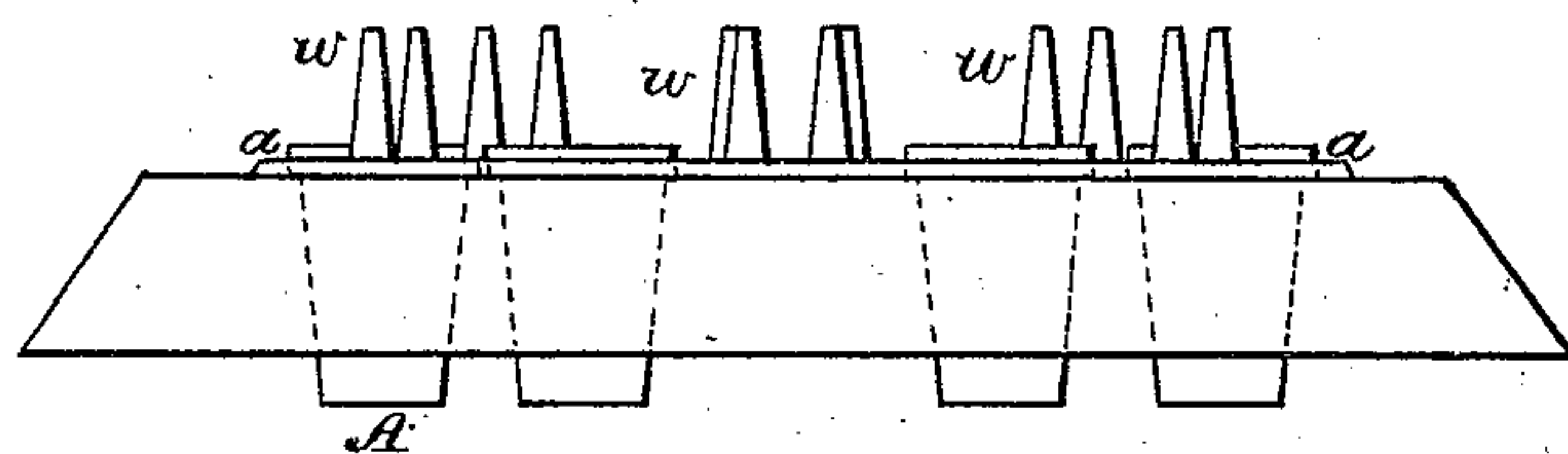


Fig. 8.



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UNITED STATES PATENT OFFICE.

ALBANUS W. MORTON, OF BROOKLYN, NEW YORK.

GAS STOVE OR HEATER.

SPECIFICATION forming part of Letters Patent No. 248,875, dated November 1, 1881.

Application filed February 4, 1881. (No model.)

To all whom it may concern:

Be it known that I, ALBANUS W. MORTON, of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Gas Stoves or Heaters, of which the following is a specification.

This invention relates more particularly to gas-stoves for heating purposes; and its object is to provide a stove in which the heated air shall be kept separate from the hot products of combustion, and in which, furthermore, the burned or intensely-heated air shall be mingled with a volume of air of a lower temperature previous to issuing from the apparatus into the room to be heated or warmed.

The invention is also designed to provide against the "lighting-back," so termed, very commonly incident to the use of the apparatus of the class just indicated, and which is due to the fact that before the lighting of the gas for use the air previously contained in the burners mingles in disproportionate quantity with the gas first admitted to the latter, and forms an explosive mixture, which, on igniting, explodes with a puff, which carries the flame back to the gas-inlet of the apparatus, thereby producing more or less of annoyance and inconvenience.

The invention comprises certain novel combinations of parts, whereby the advantages just hereinbefore specified are effectively secured, and whereby also the most effective combustion, for heat-giving purposes, of the gas is secured.

Figure 1 is a vertical longitudinal sectional view of a gas stove or heating apparatus embracing my said invention, and Fig. 2 is a horizontal sectional view taken in the line *x* of Fig. 1. Fig. 3 is a vertical longitudinal sectional view, on a larger scale, of certain portions of the apparatus; and Figs. 4 and 5 are detail views of certain parts included in the apparatus. Fig. 6 shows a modification of one of the devices included in the construction of the apparatus, and Fig. 7 is an inverted plan of the burners of the apparatus on the same scale as represented in Fig. 1. Fig. 8 is a side elevation of these burners.

A are the burners, which extend downward from a supporting-plate, *a*, which may be of circular or any other suitable form, and preferably with a circumferentially downwardly-

extending flange, *b*, which, by directing the outermost portions of the flames in a downward direction, serve to elongate the same and secure their most effective heating action below and around. The burners A have substantially the form of truncated cones, as represented in Figs. 1 and 3, with their orifices or gas-outlets *a'* arranged in radial directions, in order that the flame may surround the circumference of each of the said burners. When the burners A are made separate from the plate *a*, in order to be affixed or attached thereto, the orifices *a'* may be horizontal; but when it is desired to cast the said burners in one piece with the said plate, the burners should have the form represented in Fig. 6, in order that the outlet *a'* may, in the operation of constructing the burner, be bored in the latter without interference from the flange *b*. When the burners A are made detachable, as represented in Figs. 1 and 3, they are held in position by a flat ring, *c*, which bears upon the innermost upper edge of each of the burners, thereby holding the same down in its seat in the plate *a*. The burners A are placed in a series around a central flue, B, which latter also extends through a flange-plate, *e*, the flange of which rests upon the top of the plate *a*, so that a chamber, C, is provided above the burners A, and in direct communication with the interiors of the said burners.

Placed within the flue B are transverse webs, D, of wire-netting, having in practice a mesh of, say, about three-sixteenths of an inch dimensions.

By means of a suitable tube, *f*, which may be of sheet metal, the flue B is extended downward to any required extent within the external shell, E, of the apparatus, and in like manner, by means of a similar tube, is extended upward through a diaphragm, F, between which latter and the plate *e* is a horizontal partition, G, so constructed and arranged that the space below the partition G communicates with the space between said partition and the diaphragm F. Extending upward from the diaphragm F are metallic studs or bars *m*, the purpose of which is to receive and transmit heat from the diaphragm F, and to communicate said heat to air passed in contact therewith, as hereinafter explained.

An outlet-passage, H, is arranged above the

tube *g*, in order that the aeriform matter passed through the flue B and its tubes or extensions *f g* may be conducted into the top of the apparatus, from which they make their exit through
5 suitable openings, as indicated by the arrows at *n* in Fig. 1.

Placed within the upper part of the shell, yet some distance therefrom, is a circumferential partition, I, so arranged that an annular
10 chamber, J, is formed in the upper part of the apparatus. This annular chamber J communicates direct with the space between the diaphragm F and plate G, the space last mentioned communicating, as hereinbefore de-
15 scribed, with the space below the said plate G by means of the passage or passages *h*. The gaseous products of combustion from the flames of the burners A pass therefrom upward from the passage *h*, through the space G, upward
20 through the annular chamber J, and from the latter to a suitable flue, J', outward, preferably, to a suitable chimney. Simultaneous with the aforesaid passage of the gaseous products of combustion from the burners, and with the
25 transmission or radiation of heat from the shell E, which latter is heated more or less by the said products of combustion, a draft of atmospheric air is introduced in an upward direction through the flue B and its extensions or
30 tubes *f g*. This air, passing through the meshes of the wire-netting D, is heated thereby, as also by contact with the interior of the flue itself, the latter being heated by impact of the innermost portion of the flames of the burners A
35 against the outer surface of said flue. The air thus heated flows upward through the passage H, and thence outward, as shown by the arrows at *n*, as hereinbefore explained. Simultaneous with this there flows inward through
40 one or more passages, L, provided in the sides of the apparatus, as represented in Fig. 1, a volume of the relatively cooler atmospheric air, which, passing in contact with the studs or radiators *m*, receives a greater or less degree
45 of heat therefrom, and then mingles with a volume of the relatively intense heated air flowing upward through the flue B and tubes *f g* into the passage H, the relatively cool air thus mingling with and tempering the volume
50 of intensely-hot air, so that the volume of heated air finally issuing into the room or space to be heated is devoid of the noxious effect of a small volume of air at an extremely high temperature, and provides for the heating of the
55 compartments or spaces by means of a relatively large volume of air at a suitable, but not excessive, temperature.

Referring, now, more particularly to Figs. 3 and 5, it should be remarked that the gas
60 passes to the gas-chamber C, and thence to the burners from an inlet-chamber, M, the inlet-chamber M communicating with the chamber C by a suitable passage, *r*. The gas is supplied to the chamber M from a nozzle, *s*,
65 which in its turn connects with a suitable inlet-pipe, which may be provided with the usual

cock, *n'*. To provide for the mingling of atmospheric air with the gas previous to combustion, upon the principle of the well-known
70 Bunsen flame, the gas-chamber M communicates with the outer atmosphere by openings *f'*, and in order to provide for shutting off the atmospheric air, for the purpose herein presently explained, there is provided to said air-
75 inlet *f'* a valve or cut-off, P, which consists of a plate placed upon and capable of turning round the boss *g'*, into which is screwed the nozzle *s*, as represented in Fig. 3. In this plate are formed openings *i*, which, when the plate P is turned to a certain position, are co-
80 incident with the openings *f'*, and thus admit air into the gas-chamber M, thereby providing for the combustion of the flame as in a Bunsen burner and as hereinbefore indicated; but
85 when the said cut-off P is turned to another position the openings *i* are brought away from the openings *f'*, so that the plate or cut-off effectually shuts off or closes the openings *f'*, thereby preventing the admission of air to the
90 gas-chamber, and thereby causing the gas-burners to give the ordinary yellow or light-giving flame.

The cut-off P may be most conveniently operated by a suitable handle, *j*.

The result of this construction in the opera-
95 tion of the apparatus is as follows: When gas is first turned on to supply the burners A, the atmospheric air previously contained within the latter and also in the chamber C must
100 be displaced before the normal operation of the burners can proceed. During this displacement a portion of the gas mingles with the air in such proportions as to constitute an explosive mixture, and hence when the flame
105 is kindled a slight puff or explosion is likely to occur, and this carries the flame back to the nozzle *s*. In order to extinguish this the cut-off P is turned to shut off the access of atmospheric air from the gas-chamber M, whereupon
110 the flame at the nozzle *s* is extinguished for lack of oxygen, while that of the burners continues, because of the supply of oxygen from the surrounding atmosphere within the shell E, the flame itself being, however, in this case
115 the ordinary yellow or light-giving flame; but by reversing the movement of the cut-off to again admit atmospheric air to the gas-chamber M the burners are caused to afford the
120 Bunsen or non-luminous flame required in securing the most effective operation of the apparatus for heating purposes.

What I claim as my invention is—

1. The combination, in a gas stove or heater, of the flue B, the gas-chamber C, the burners
125 A, placed to heat the said flue, and a gas-supply tube or pipe, substantially as and for the purpose herein set forth.

2. The combination of wire-netting D with the flue B, gas-chamber C, and gas-supply tube
130 or pipe, and a series of burners, A, placed to heat the said flue, and thereby cause the upward draft of a volume of air through the flue

and in contact with the heated netting, substantially as and for the purpose herein set forth.

3. The combination of the flue B, provided
5 with the wire-netting D, the gas-chamber C, the gas-supply pipe or tube M, the series of burners A, placed to heat the flue B, and its contained wire-netting, and the studs or radi-
10 ondary volume of air during its passage to unite with the primary volume of air heated by its passage through the flue B, substantially as and for the purpose herein set forth.

4. The combination of the burner or burners
15 A, a surrounding external shell, E, and a gas-inlet, M, constructed with a nozzle, s, and a

cut-off, P, the whole arranged substantially as herein set forth, for the purpose of enabling the air to be shut off from the chamber M, when the flame flares back from the burner or
20 burners A within the shell to the nozzle s in lighting the burner or burners, as described.

5. The combination of the heat-radiating studs or spurs *w*, formed upon the plate *a*, with the gas-chamber C, gas-supply pipe or tube M, 25 flue B, and burners A, substantially as and for the purpose herein set forth.

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