

(No Model.)

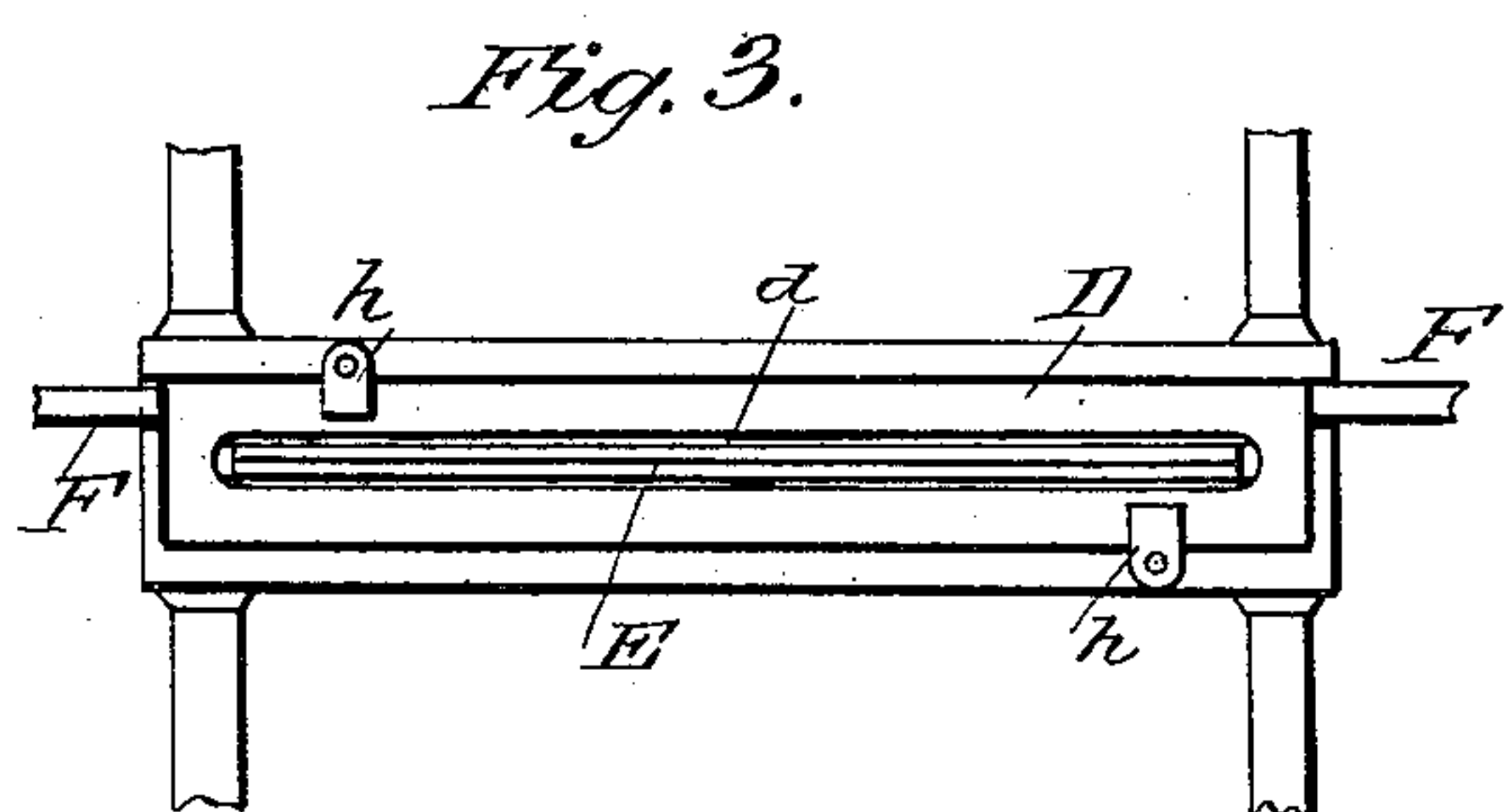
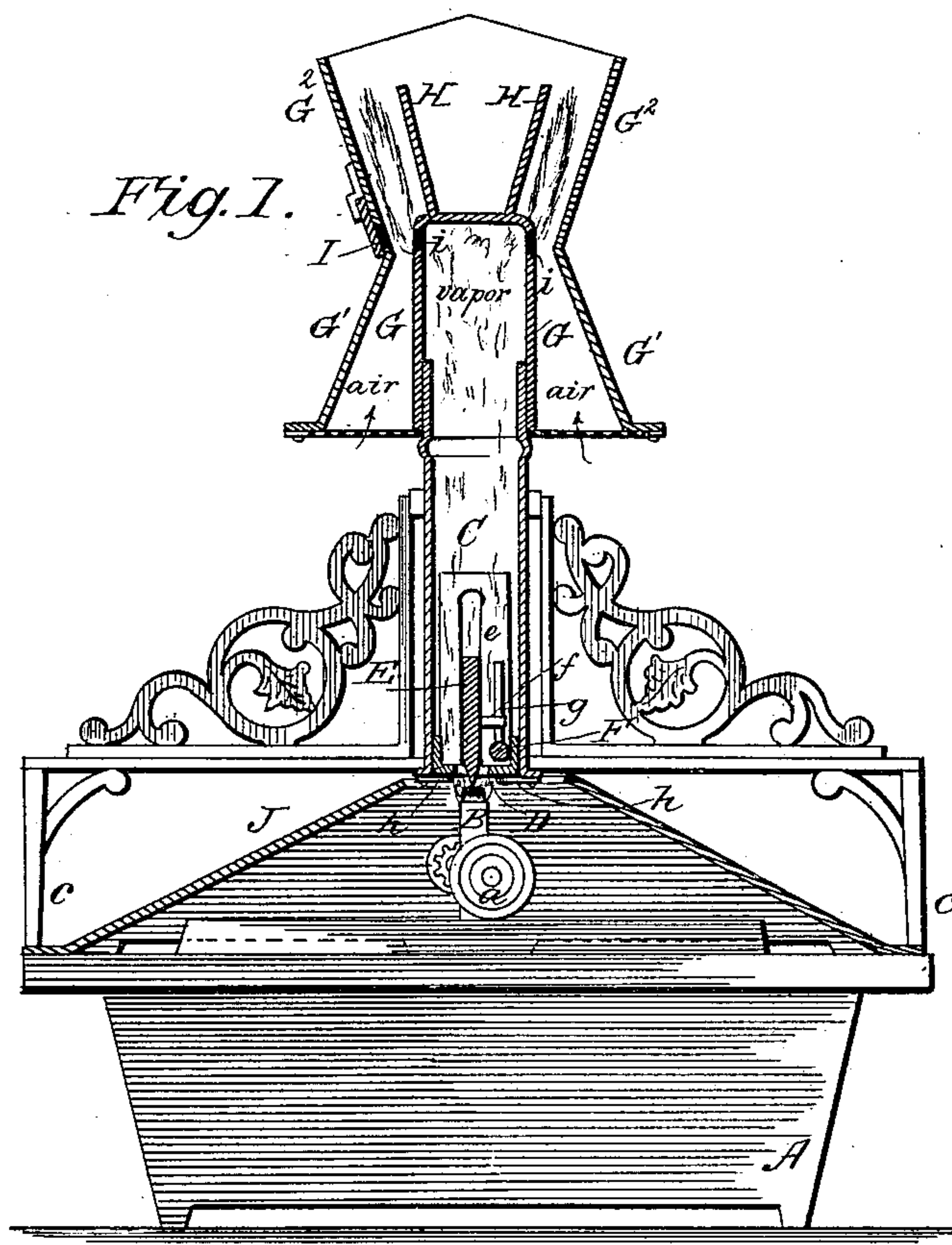
2 Sheets—Sheet 1.

W. W. BATCHELDER, Jr.

OIL VAPOR HEATER.

No. 373,429.

Patented Nov. 22, 1887.



WITNESSES:

*Fred G. Dieterich*  
*Edw. W. Byrnes*

INVENTOR:

*W. W. Batchelder, Jr.*  
BY *Munn & Co.*  
ATTORNEYS.

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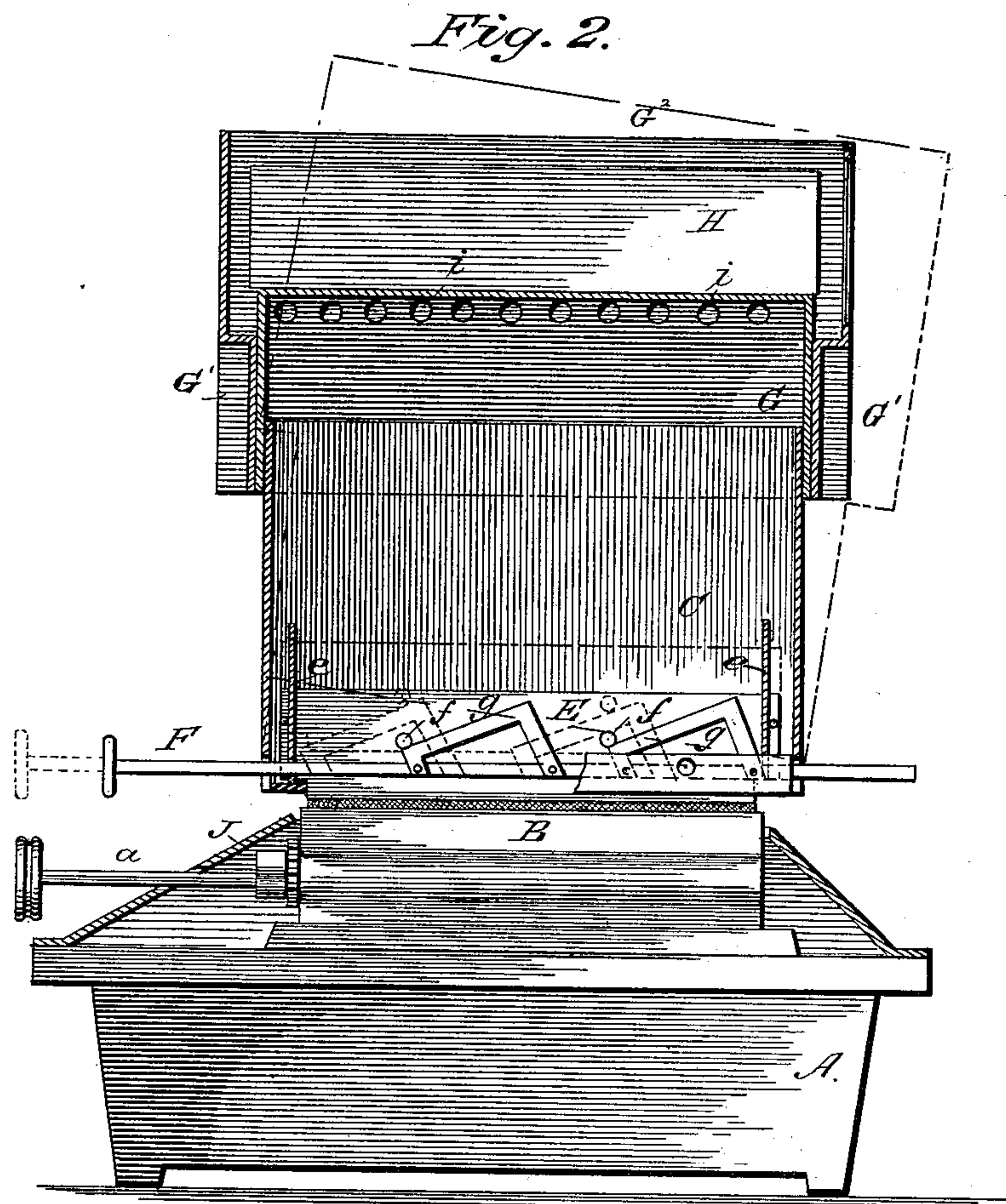
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# UNITED STATES PATENT OFFICE.

WILLIAM W. BATCHELDER, JR., OF BOSTON, MASSACHUSETTS.

## OIL-VAPOR HEATER.

SPECIFICATION forming part of Letters Patent No. 373,429, dated November 22, 1887.

Application filed February 21, 1887. Serial No. 228,604. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM W. BATCHELDER, Jr., of Boston, in the county of Suffolk and State of Massachusetts, have invented  
5 a new and useful Improvement in Oil-Vapor Heaters, of which the following is a specification.

My invention relates to that class of oil stoves or heaters in which a wick is employed  
10 to draw up the oil, which is first vaporized at the wick by a small initial flame and then passes in the form of an unconsumed vapor up to the burner proper, where its heat and light are utilized.

15 The main objects of my invention are to prevent the escape of bad odors when the burner is extinguished, to increase the heating capacity of the burner, and to regulate the vaporization of the oil; and it consists in the peculiar construction and arrangement of parts,  
20 which I will now proceed to describe with reference to the drawings, in which—

Figure 1 is a vertical transverse section through the burner. Fig. 2 is a vertical longitudinal section, and Fig. 3 is an inverted  
25 plan view, of the vapor-chamber.

A represents the oil-reservoir, from which rises the wick-tube B, provided with the usual toothed wheels, and a projecting shaft, *a*, with  
30 milled disk for raising and lowering an ordinary wick, *b*. Mounted upon the four feet *c* on the reservoir is the vertical vapor-chamber C, which is arranged to tilt at one end, as shown in dotted lines, Fig. 2, on one pair of  
35 feet, to give access to the wick. This vapor-chamber is a little wider and a little longer than the wick, and its lower end is open and rests immediately above the wick-tube. In order to cause the ignited wick to vaporize  
40 the oil without consuming the vapor at this point, it is necessary that only enough flame should be allowed at the wick to produce the volatilization of the oil, and to effect this the relation of the wick and its tube to the vapor-  
45 chamber above is so close as to allow only a small amount of air to combine with the vapor at the wick, so that the bulk of the vapor passes up the vapor-chamber unconsumed till it reaches the burner proper above.

50 In the lower part of the vapor-chamber is a diaphragm, D, with a narrow slit, *d*, in it, which

bears such a close relation to the wick below as to permit the result just described. As, however, the wick is raised and lowered, the space between the wick-tube and the slit varies, and to prevent too great access of air, which would permit too great a luminosity and an imperfect combustion here, which would throw off and deposit soot, I have provided a compensating-bar, E, whose length is  
55 equal to the width of the wick and which is wedge-shaped on its lower edge, and rests in the plane of the wick immediately above and normally touching the same. The object in making the lower edge of this bar wedge-  
60 shaped is to prevent it from spreading laterally or smothering the flame to too great an extent. As the wick is lowered and the space increased between the wick and the slit *d* above, this compensating-bar or follower  
65 drops down through said slit with the wick, reducing the size of the opening and partially smothering the flame, so as to correspondingly reduce the flame at this point in proportion to the lowering of the wick, keep-  
70 ing the flame down to a blue line instead of allowing it to become luminous and smoky. This bar E has also the function by being raised above the wick, as shown in dotted lines Fig. 2, of allowing free access of air to the  
75 wick, and a free exposure of the top of the latter to allow the flame on the wick to burn freely and unobstructed and the production temporarily of the maximum amount of heat at this point which is needed when the wick  
80 is first lighted in order to bring up the temperature of the vapor-chamber to a point where it does not condense the vapors and produce a bad smell. To effect this adjustment of the bar its ends pass into slots in vertical guides *ee*,  
85 and it has at one side laterally-projecting pins *ff*, which rest upon the upper surfaces of the inclined cams *gg*, attached to a sliding rod, F, which extends out through the side of the vapor-chamber. Now, as this rod F is slid in  
90 or out its inclines, sliding beneath the pins *ff*, cause the compensating-bar to be positively raised and lowered independently of its contact with the wick. I do not, however, confine myself to this particular means of adjust-  
95 ment, as other means for raising and lowering the bar may be used. I prefer this adjustment,  
100



however, because, while I am enabled to raise the bar at will, it leaves it, when seated upon the wick, free to act as a follower to the same when raised or lowered, and permits, also, of the adaptation of the bar or follower to any irregularities of the wick due to trimming—such for instance, as the trimming of one side of the wick higher or lower than the other—thus securing always a proper position and relation of the bar or follower on the wick, even if its upper edge be not a true horizontal line. For facility in cleaning these parts, as well as the interior of the vapor-chamber, the diaphragm D with its compensating-bar and its attachments are made together removable from the bottom end of the vapor-chamber C, being held therein by means of pivotal buttons  $h$ , or by set-screws or other equivalent means.

Upon the top of the vapor-chamber C is detachably seated the burner-chamber G, which fits with a sliding joint onto the top of the vapor-chamber, as shown; but the said burner and vapor chamber may be made integral, if desired. The burner is flanked upon each side with downwardly-flaring skirts G' G', having bottoms of perforated metal through which air is admitted to support combustion.

Opening through the sides of the chamber G is a series of holes,  $i$ , through which the vapors pass, and which vapors at this point come in contact with the air admitted beneath the skirts G' and burn in a series of flames. From the level of these jets the burner-case is extended upwardly with divergent sides G<sup>2</sup> G<sup>2</sup>, and upon the top of the chamber G, and in metallic contact with the walls of the latter, are one or more upwardly-projecting wings H H. These wings or projections serve two very important functions, in that they act as heat-conductors to transfer the heat of the flame to the vapor-chamber below and by raising and maintaining the temperature of the walls and interior of the vapor-chamber to so high a degree of heat that no vapor will or can remain to escape after the burner has been extinguished. With all burners of this class as ordinarily constructed vapor will remain on the inside surface of the walls and in the interior of the vapor-chamber, which vapor will continue to escape for some time after the burner has been extinguished, producing a very disgusting and nauseating odor. With the application of the heat-conducting wings or projections this extremely objectionable feature is completely overcome and avoided.

The wings H H not only act as conductors to transfer the heat of the adjacent flames to the vapor-chamber below, as abovestated, but they also act as deflectors to the currents to spread the flames and produce more perfect combustion, also affording additional heat-radiating surfaces, thereby considerably increasing the heating capacity of the burner.

It will be perceived that the outside casing of the burner is somewhat longer than the wings H and the chamber G. This is to give

a sufficient volume of air to the end jets, which would otherwise burn with a high flame and smoke.

In the outside casing are arranged one or more openings covered by a door or slide, I, through which access may be had to the jet-holes in chamber G, to clean them from the incrustation which sometimes accumulates. These openings may correspond in number and size to the jet-holes, and be covered by a slide having similar openings, as shown, or there may be a single horizontal opening in the casing provided with a hinged or sliding door for closing the same.

In the use of oil-burners of this class it is found that a certain amount of oil will unavoidably collect upon the top of the reservoir and create a bad smell. To avoid this smell I have arranged a hood or cover, J, fitting closely to the top of the reservoir at its edges and curving to a central outlet directly at the wick, so that the draft at the wick will draw these vapors into the vapor-chamber and burn them, thus providing an economic and desirable disposition of these bad odors, which otherwise constitute an objectionable feature. At the same time, also, this hood protects the volatilizing flame from being extinguished or from flickering caused by lateral drafts of air, which is also an important advantage.

In making use of my invention the vapor-chamber is first tilted on two of its legs to give access to the wick, which being lighted the chamber is dropped back to its position above the wick. The compensating-bar being elevated to its highest position, this permits combustion to take place at the wick only, in which condition the burner is left for a few minutes until the vapor-chamber becomes sufficiently heated. The compensating-bar is then dropped down, and the wick raised till it comes in contact with the edge of said bar or follower, and the vapor which is generated in the vapor-chamber is then immediately ignited at the jet-holes above, and the burner is then in normal operation.

The compensating-bar, it will be seen, rests upon the wick, and follows it in its adjustment up and down, and serves always to keep a proper relation between the blue or volatilizing flame and the amount of vapors being generated, and preventing the smoking and clogging of the burner. When the burner is to be extinguished, the wick is merely turned down until the blue or volatilizing flame dies out, which it does gradually without allowing any smell, for the vapors produced at this point are consumed.

Having thus described my invention, what I claim as new is—

1. The combination, with the wick-tube and a vapor and burner chamber arranged above it, of the burner-casing G' G<sup>2</sup>, provided with a vapor-outlet and wings H H at the top of said burner, substantially as shown and described.

2. The combination, with a wick-tube and



- means for raising and lowering the wick, of a vapor and burner chamber arranged above it, and a vertically-adjustable compensating-bar or follower resting upon said wick, and
- 5 special means for positively lifting the same from the wick independent of the adjustment of the wick, substantially as and for the purpose described.
- 10 3. The combination, with a wick-tube, of a vapor and burner chamber arranged above it and having at its lower end a diaphragm with a slit in it, and a vertically-adjustable compensating-bar playing through said slit and resting upon the wick, and means for posi-
- 15 tively lifting the same from the wick, substantially as and for purpose described.
- 20 4. The combination, with the wick-tube, of a follower resting upon the wick and moving with it, and having perfect freedom of motion to cant or adjust itself to the irregular edge of the wick, substantially as described.
5. The combination, with the wick-tube, of a vapor and burner chamber arranged above
- it, and a horizontal compensating-bar or follower resting upon the wick and constructed 25 with a reduced lower edge, substantially as and for the purpose described.
6. The combination, with the wick-tube, of a vapor and burner chamber arranged above it, and a detachable perforated diaphragm ar- 30 ranged within the vapor-chamber, and a vertically-adjustable follower for the wick playing through the perforation in the diaphragm, substantially as and for the purpose described.
7. The combination, with the wick-tube, of 35 a vapor and burner chamber arranged above it, and a diaphragm for said chamber with a slit and vertically-guided follower or compensating-bar playing through said slit, and a sliding rod with inclines operating upon the follower 40 to positively raise the same, substantially as shown and described.

W. W. BATCHELDER, JR.

Witnesses:

EDWD. W. BYRN,  
SOLON C. KEMON.