

(No Model.)

L. KETCHUM.

GAS STOVE.

No. 396,576.

Patented Jan. 22, 1889.

Fig. 1.

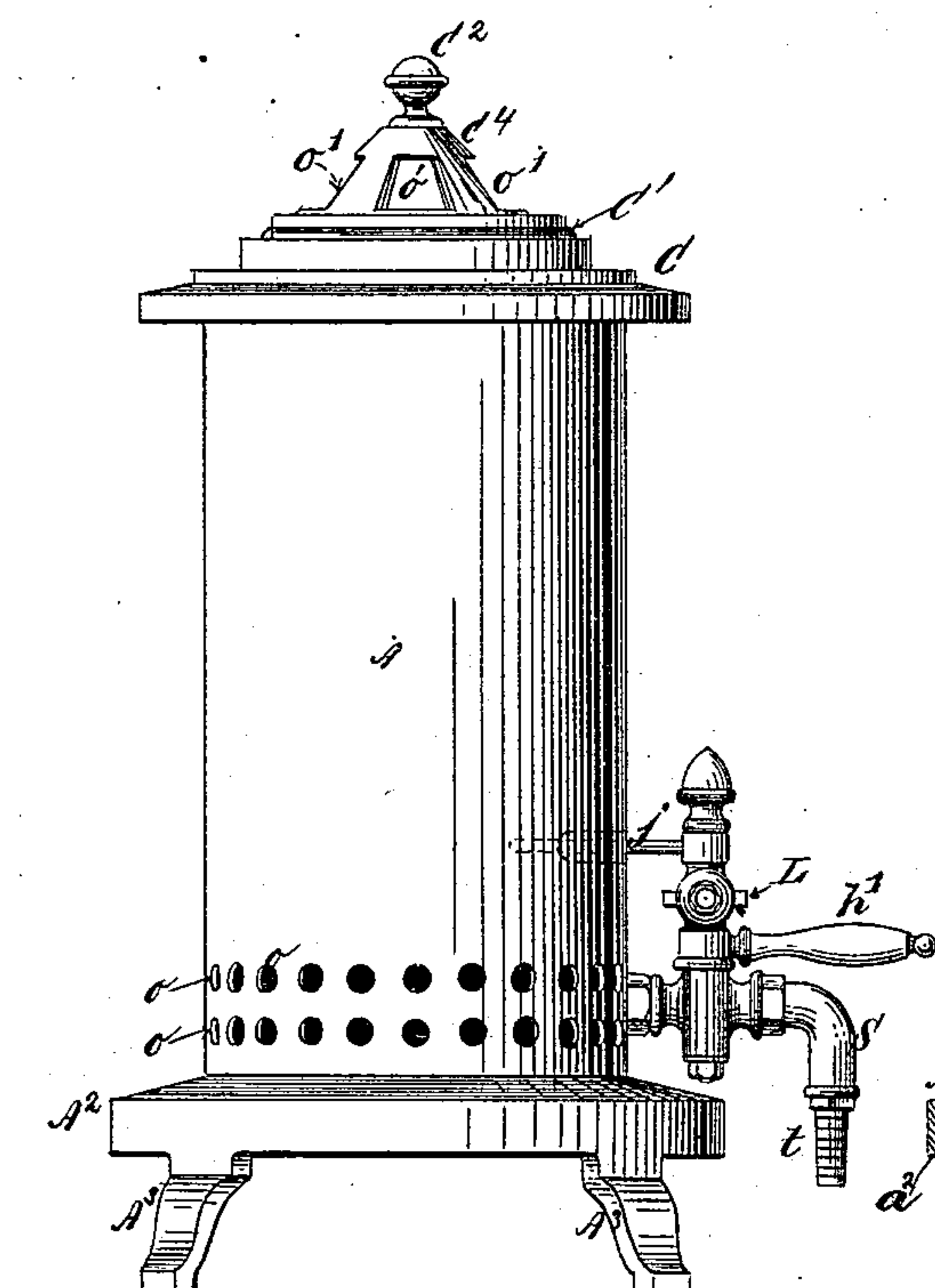


Fig. 2.

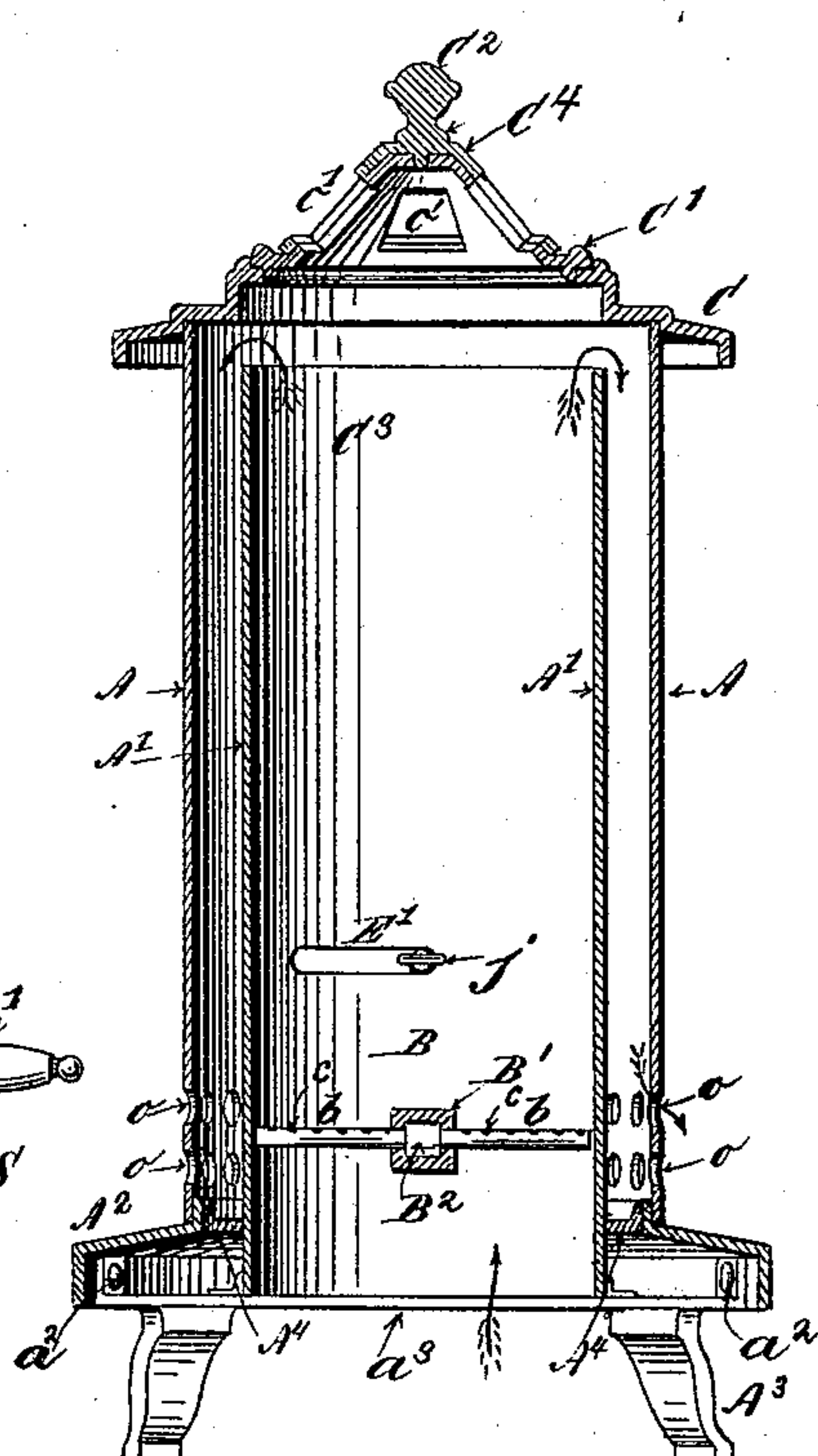
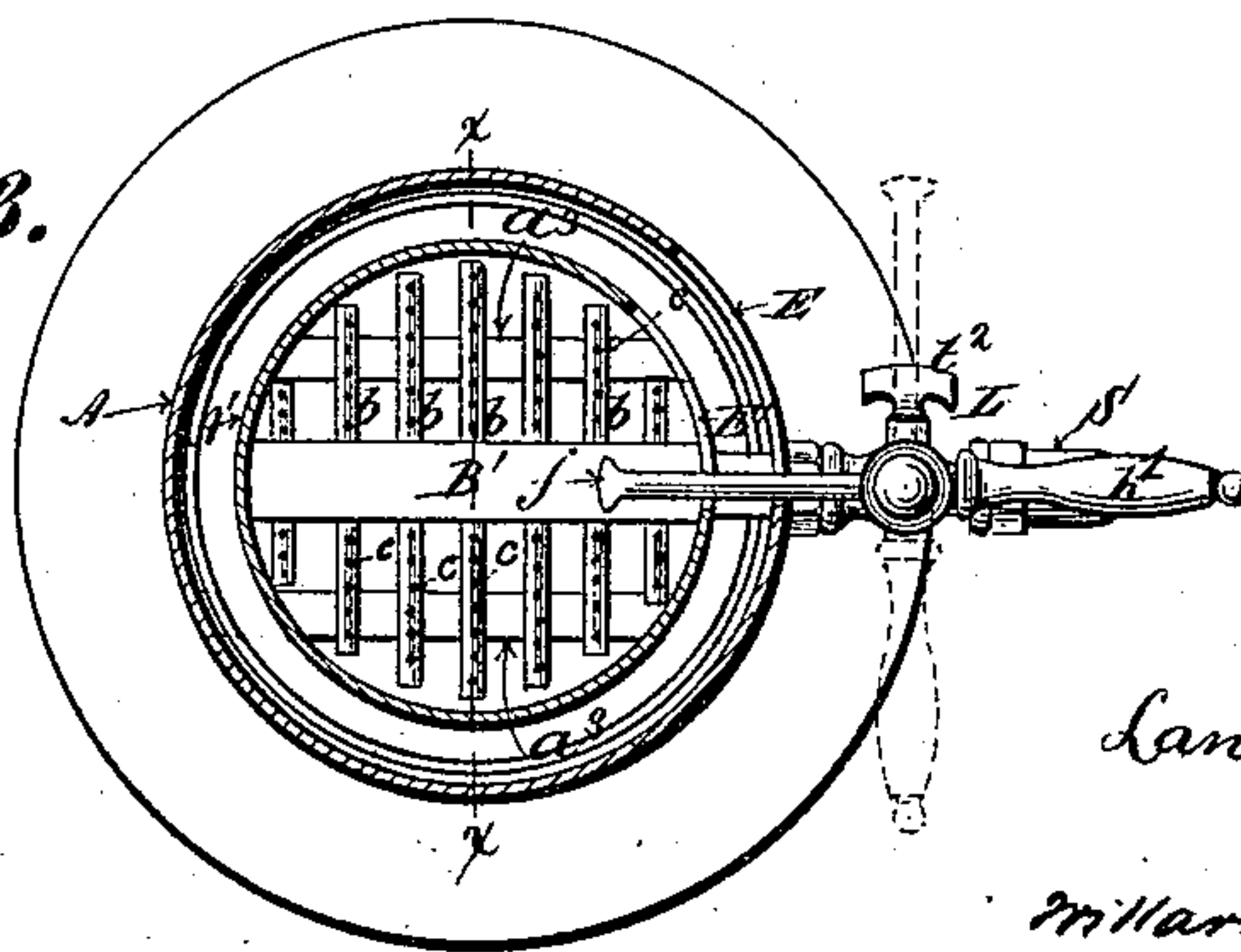


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## GAS-STOVE.

SPECIFICATION forming part of Letters Patent No. 396,576, dated January 22, 1889.

Application filed April 10, 1888. Serial No. 270,163. (No model.)

*To all whom it may concern:*

Be it known that I, LANDON KETCHUM, a citizen of the United States, and a resident of Saugatuck, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Gas-Stoves, of which the following is a specification.

My invention relates to an improved form of gas-stove for all kinds of domestic purposes, but more especially to that class of gas-stoves which resemble ordinary coal-stoves in external appearance, the object of the invention, like that for which I have already on the 25th day of November, 1887, filed an application for Letters Patent of the United States, which application is numbered serially 256,042, being to a certain extent to supply a gas-stove which will have, so far as possible, all of the advantages of an ordinary coal-stove, and yet possess none of the disadvantages which are always present in coal-stoves, owing to the nature of the fuel which is employed therein. The principal object of the invention, however, is so to combine and arrange the elements which exist in the ordinary gas-stove with certain new elements that a stove will be produced which will give a maximum amount of heat from a minimum amount of gas, in which the combustion of gas will be absolutely perfect, which will be easy and cheap to construct, which will be made up of such a simple arrangement of parts that the stove can practically never get out of order or become broken, and in which the arrangement of the parts is such that the heated air will emerge at the extreme base of the stove, thus entering the room or other space to be heated very close to the floor, (which is always the coldest point of the room,) thereby very greatly increasing the efficiency of the stove in heating. This latter effect is produced by a novel arrangement of devices, hereinafter described, for controlling the direction of the currents of air heated and for permitting them to emerge from the stove at the desired point.

The invention will be best understood by reference to the accompanying sheet of drawings, in which—

Figure 1 is an elevation of the gas-stove and lighting apparatus; Fig. 2, a sectional elevation of the same on the line  $x x$  of Fig. 3; and

Fig. 3 is a horizontal section on a line drawn horizontally through the stove at its center.

Similar letters refer to similar parts throughout the several views.

In all of the views, A represents the outer shell of the stove, made of sheet-iron, in the form of a cylinder, of any desired diameter, according to the size of the stove.

A<sup>2</sup> represents the bottom or base of the stove, which is a metal casting, made preferably of iron, in the shape shown, to which the shell A is attached in any convenient manner.

The stove is provided with any convenient number of metallic legs, A<sup>3</sup>, as shown in the views, the same being secured to the base A<sup>2</sup> in any manner that will admit of their being readily removed when it is desired to take the stove to pieces for packing and shipment. In the views the legs are shown as made in one piece with the horizontal girders  $a^3 a^3$ , which are provided with turned-up flanges at their extremities, and are bolted to the base A<sup>2</sup> by the bolts  $a^2 a^2$ , as shown in Fig. 2.

The top of the stove is formed of a circular casting, C, Figs. 1 and 2, which fits closely over the top of the shell A, and in practice is attached thereto in the same manner as the latter is attached to the base A<sup>2</sup>. A movable cover, C', preferably of conical shape, surmounts the casting C, and is provided with a knob or equivalent device, C<sup>2</sup>, for lifting and removing the same. The cover C' contains any convenient number of openings,  $o' o'$ , in its conical walls, which are closed from within or without by a rotating or sliding damper, C<sup>4</sup>, containing any number of suitable openings for closing or diminishing the size of the openings  $o' o'$  from time to time, as may be necessary. Any other form of damper may be used that will permit of the openings in the top of the stove being opened or closed at pleasure, and any other form of top may be used that will permit of adjustable openings therein for allowing the escape of the heated gases.

The gas-stove is provided in its interior with a hollow sheet-metal shell, A', cylindrical in form and of slightly less diameter than the exterior shell, A, as shown in Fig. 2, so that there will be a space of one or more inches between the two shells A and A'.



The inner shell, A', extends downward to the extreme base of the stove, and, as a matter of convenience and solidity, may be made to rest directly upon the horizontal girders  $a^3 a^3$ , as shown in Fig. 2. The shell A' extends upward to the top of the stove, a slight space being left between it and the upper casting, C, to admit of the passage of the heated gases around and over it. The space at the base of the shells A and A' is securely closed, as shown in Fig. 2, by means of a circular ring of sheet metal, A<sup>4</sup>, which is shown cut by the plane of section, that will completely cut off all access to the space between the shells A and A' at the bottom. The inner space within the cylinder A' is open at the bottom, so that air can pass up freely into the interior, C<sup>3</sup>, of the cylinder A' and supply the burner B. The outer shell, A, is provided at its extreme base with a series of openings, o o, &c., as shown in Figs. 1 and 2. These openings are all of the same size and are placed, preferably, on the same line or in series of horizontal lines, and they serve to permit the escape of the heated gases from the stove into the space to be heated. In the views two series of horizontal openings are shown.

The burner which is used is substantially the same as that shown and described in the aforesaid application for Letters Patent heretofore filed, and is shown in detail in Figs. 2 and 3.

B represents the burner as a whole, which has the general appearance of an ordinary gridiron. It is provided with a central gas-supply pipe, B', with the interior passage, B<sup>2</sup>, which passes through its entire length, and from which a series of horizontal and parallel pipes, b, emerge, which vary in length according to the curvature of the shell A'. These pipes contain any desired number of openings, c, on their upper surface, through which the gas emerges and at which point it is ignited and burns. The burner B is supported in the interior of the stove in the manner described in the aforesaid previously-filed application, or in any other convenient manner.

The gas is supplied to the stove by an arrangement of devices, L, similar to that shown and described in said application and shown in the present case in Figs. 1 and 3 of the drawings. In these views, S represents the supply-pipe, and t the nipple for making the connection from the source of supply. j represents the ignition-jet, which is supplied with gas from an opening in the valve-spindle. h' is the handle whereby the valve is opened and the ignition-jet rotated in and out of the stove. t<sup>2</sup> is a thumb-piece for actuating a valve in the passage leading to the ignition-jet, by turning which the gas can be admitted to or cut off from the jet. Two slits or horizontal openings, E and E', are provided in the shells A and A', for the purpose of permitting the passage of the ignition-jet j into the interior of the shell A' and igniting the burner B when the handle h' is turned.

When the handle h' is in the position shown in Figs. 1 and 3, the gas is admitted to the burner at its full head; but when the handle h' is turned to the position shown by the dotted lines in Fig. 3 the gas will be cut off from the burner B, but will remain burning at the igniting-jet until cut off by the thumb-piece t<sup>2</sup>. When the handle h' is turned back to its former position, the gas will be turned on and the ignition-jet j, passing through the slits E and E', will approach the burner and ignite the gas. When the stove is burning, the ignition-jet remains burning within it, the handle assuming the position shown in Fig. 3.

In view of the foregoing description a detailed description of the method of operation of the stove will be unnecessary. The direction of the currents of air and hot gas is shown in Fig. 3. The cold air enters at the center of the stove at the base and passes upward through the burner and the shell A', where it becomes thoroughly heated. The damper C<sup>4</sup> upon the top of the stove being closed, the air, when the top of the shell A' is reached, passes downward through the space between the inner and outer shells and emerges through the openings o o, &c., at the base of the stove.

It will be apparent that with a stove and burner of the character of those above described the gas will be burned at a great many places at the same time, and the number of points at which heat is being given forth within the stove will be very great. Again, as the burner is of the peculiar gridiron shape shown, the air can enter between the various arms c c, &c., with the greatest ease and pass up to the various points of ignition, and by making the inner shell, A', in the form of a hollow cylinder opening to the air at its bottom and into the dome at the top, and unimpeded, except by the presence of the gas-burner, throughout its entire length, a powerful draft is created throughout the interior of the stove, thus insuring a great amount of heating-surface and perfect combustion of the gas. The damper in the top of the stove serves to regulate the amount of hot air which is caused to pass out at the base of the stove, and the inner shell serves to regulate the currents of hot air and increase the amount of heating-surface.

When it is desired to heat any vessel, &c., on the stove, the conical cover C' may be removed and an ordinary flat cover used in its place, either with or without air-openings or damper.

I claim as my invention—

1. In a gas-stove, the combination, substantially as hereinbefore set forth, of an outer hollow shell or cylinder surmounted by a closed top having an adjustable opening therein and provided with one or more openings at or near the bottom of the same for the escape of gas, an inner hollow shell or cylinder within the said outer shell open at both top and bottom and unobstructed throughout its entire length except by the burner, so as to permit



5 a free escape of the hot air and gas, means, substantially as described, for closing the space between the two shells at the bottom, and a gas-burner in the hollow interior of the inner shell at or near the base of the same.

10 2. In a gas-stove, the combination, substantially as hereinbefore set forth, of an outer hollow shell or cylinder closed at the top and provided with one or more openings at or near the bottom of the same for the escape of the hot gases, an interior hollow shell or cylinder within the said outer shell open at both top and bottom and unobstructed throughout its entire length except by the burner, so as to  
15 permit of the free escape of hot air and gas, means, substantially as described, for closing the space between the two shells at the bottom, and a gas-burner in the hollow interior of the inner shell at or near the base of the  
20 same.

3. In a gas-stove, the combination, as hereinbefore set forth, of an outer shell or cylinder closed at the top, provided with one or

more openings at or near the bottom of the same, an inner hollow shell or cylinder within  
25 said outer shell open at both top and bottom and unobstructed throughout its entire length except by the burner, so as to permit of free escape of hot air and gas, means, substantially as described, for closing the space  
30 between the two shells at the bottom, and the gas-burner in the hollow interior of said shell at or near the base of the same, composed of a series of horizontal and parallel gas-supply pipes having openings or jets on their upper  
35 surfaces for the burning of the gas, said pipes being connected with the central gas-supply pipes.

Signed at New York, in the county of New York and State of New York, this 5th day of  
40 April, A. D. 1888.

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Witnesses:

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