

(No Model.)

2 Sheets—Sheet 1.

L. KETCHUM.
GAS STOVE.

No. 396,575.

Patented Jan. 22, 1889.

Fig. 1.

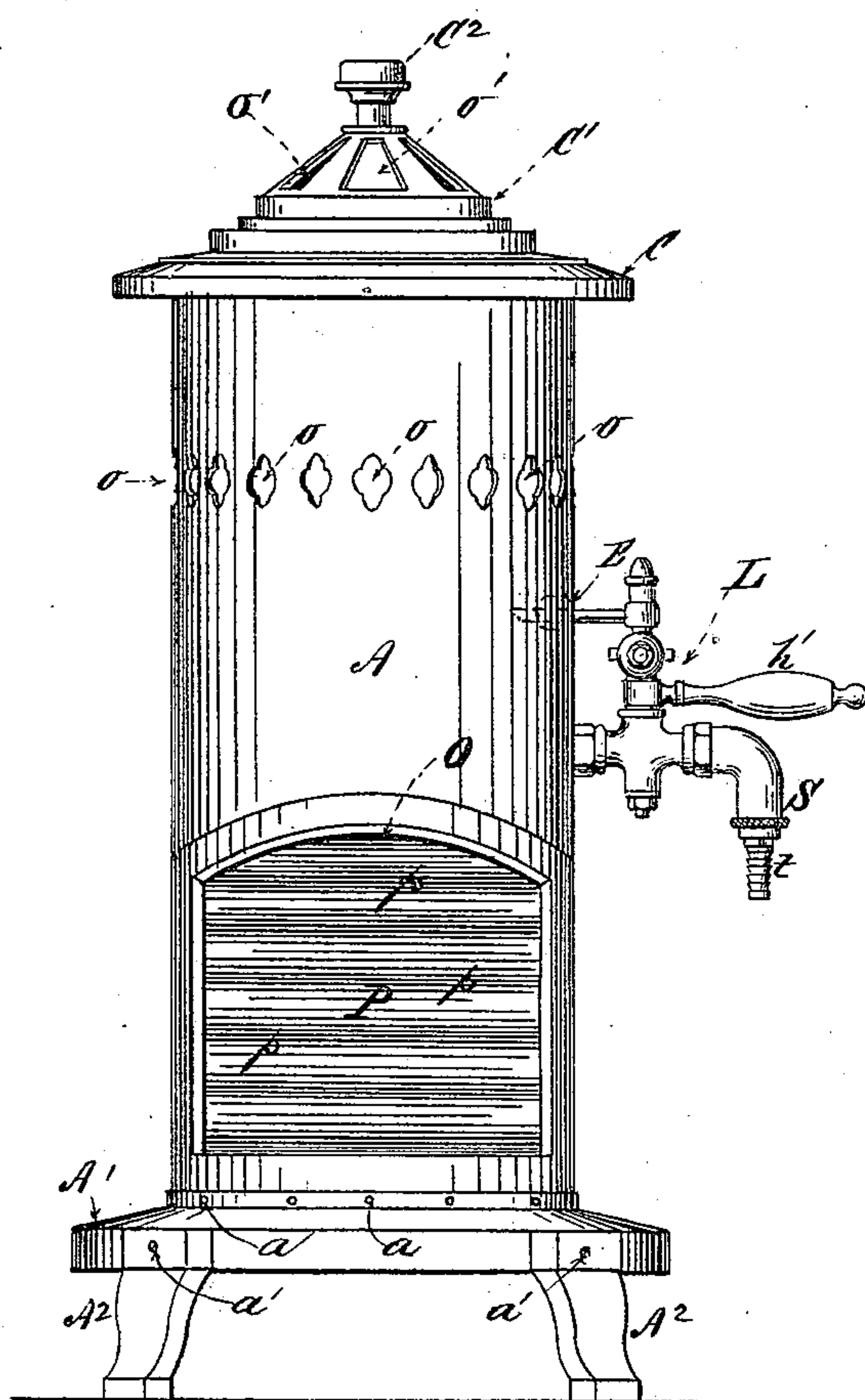
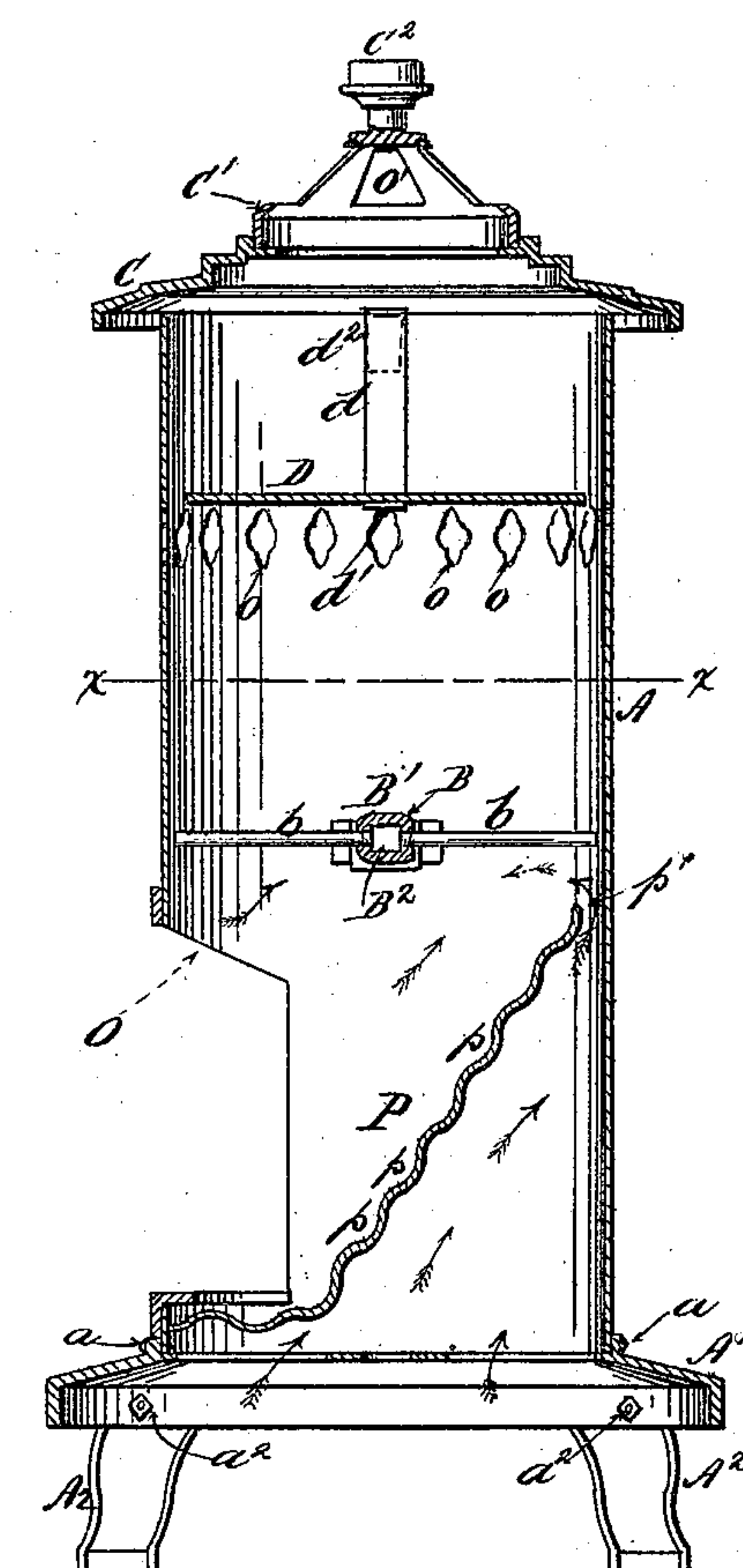


Fig. 2.



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By his Attorney
William Parker Butler

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2 Sheets—Sheet 2.

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Fig. 3.

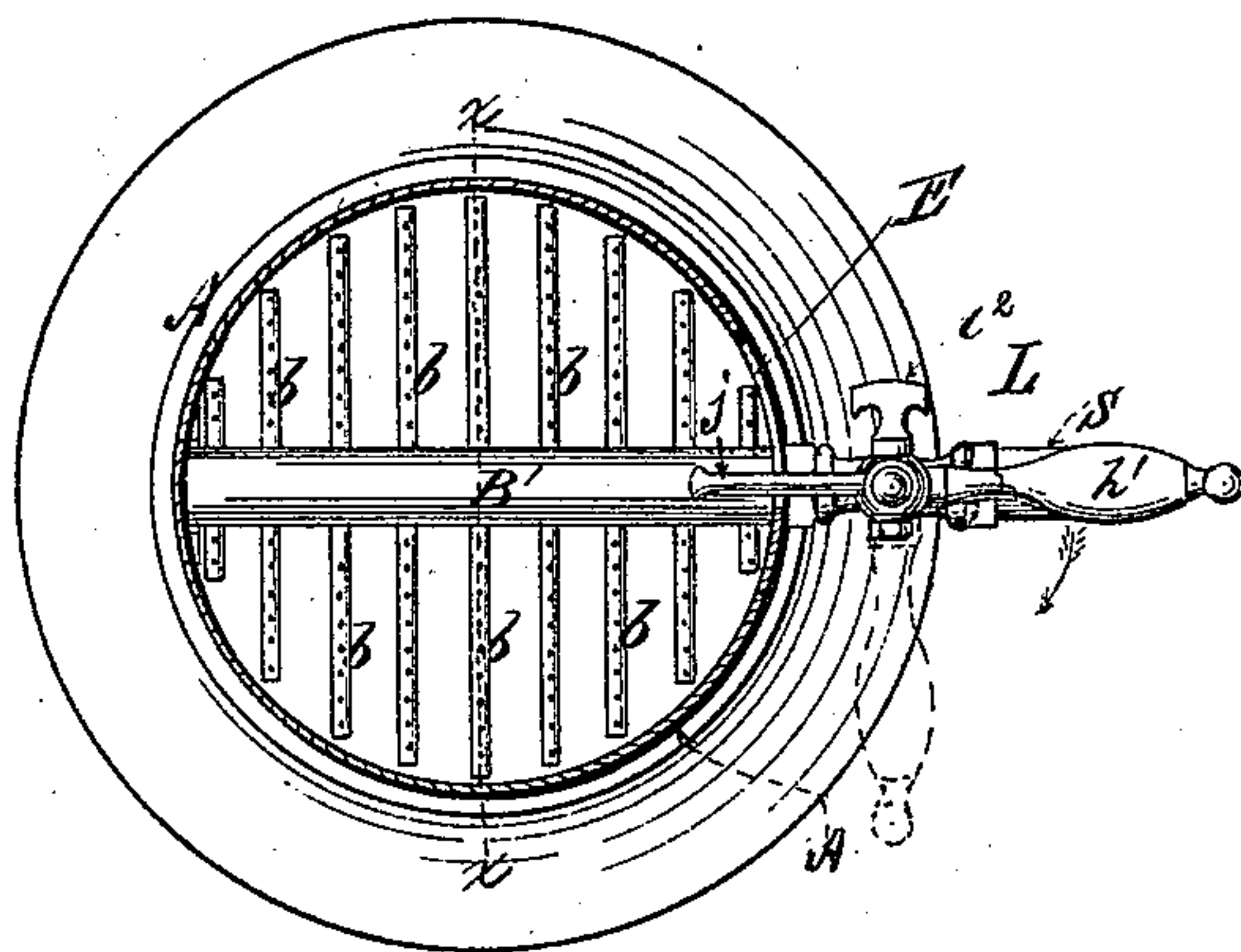


Fig. 4.

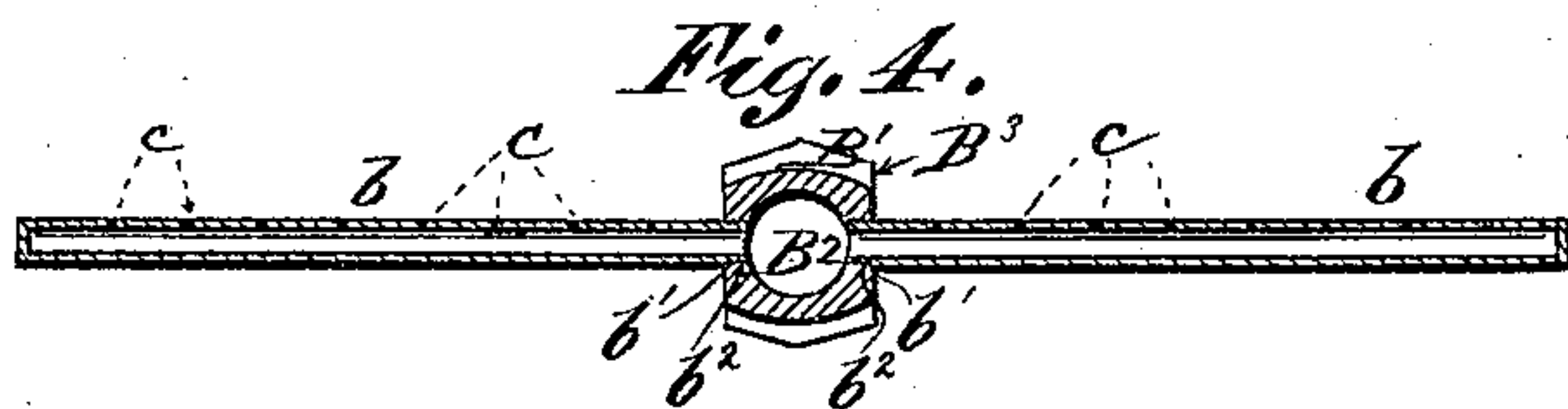
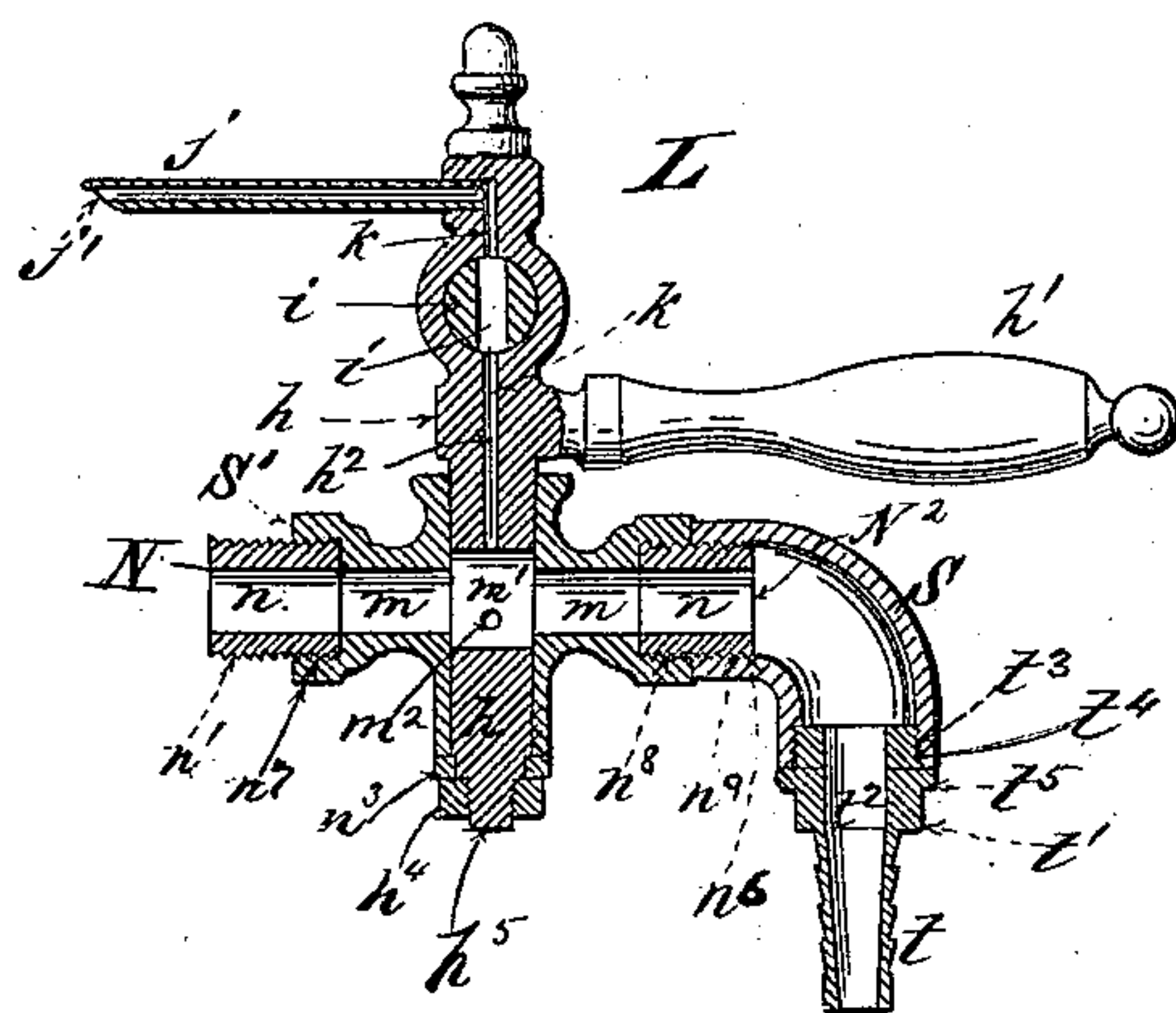


Fig. 5.



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UNITED STATES PATENT OFFICE.

LANDON KETCHUM, OF SAUGATUCK, CONNECTICUT.

GAS-STOVE.

SPECIFICATION forming part of Letters Patent No. 396,575, dated January 22, 1889.

Application filed November 25, 1887. Serial No. 256,042. (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 particularly to that class of gas-stoves which resemble ordinary coal-stoves in external appearance, the object of the invention being to a certain extent the production of a gas-stove which will have, as far as possible, all of the advantages of an ordinary coal-stove, and yet will possess none of the disadvantages which are always present in coal-stoves by reason of the nature of the fuel which is therein employed; but the principal object of the invention 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 afford the largest possible amount of heating-surface compatible with economical expenditure of fuel, and which will consequently give forth a maximum amount of heat from a minimum amount of gas, in which the combustion of gas will be absolutely perfect, in which the greatest amount of heat will be given off at as low a point in the stove as is compatible with perfect combustion, thereby giving forth the most heat near the floor of the room, (which is the coldest part of the space to be heated,) which will be easy and cheap to construct, and 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.

Another object which it is desired to attain by the invention is the production of a gas-stove possessing the above-mentioned advantages, which will be so constructed that it will possess very little weight and be very easily handled, so that it may be set up or removed at or from any desired point in a room or other space by any person, however lacking in physical strength.

In my invention the elements are so combined and arranged that the disadvantages common in gas-stoves are entirely obviated

and the above-mentioned very desirable advantages are obtained.

The invention will be best understood by reference to the accompanying two sheets of drawings, containing in all five figures, in which—

Figure 1 is a vertical elevation of the stove; Fig. 2, a vertical section of the same; Fig. 3, a horizontal section on the line *xx* of Fig. 2; Fig. 4, a vertical section of the burner on the line *xx* of Fig. 3, and Fig. 5 a vertical section of the gas-ignitor.

These sheets of drawings are to be taken with and form a part of this specification, and similar letters refer to similar parts throughout the several views.

In all of the views where it appears, 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' 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 by the bolts or screws *a*, &c., as shown in Figs. 1 and 2, or in any other convenient manner.

The stove is provided with any convenient number of metallic legs, A² A², as shown in the views, the same being secured to the base A' 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 A² A², &c., are shown to be attached to the base A' by means of one or more screw-bolts, *a'* *a'*, which are provided with the nuts *a²* *a²*, which are screwed tight by means of an ordinary wrench.

The top of the stove is formed of a round casting, C, Figs. 1 and 2, which fits closely over the top of the shell A, and in practice is bolted to the shell in the same manner as the latter is fastened to the base A'. A movable cover, C', Figs. 1 and 2, provided with a knob or handle, C², for lifting the same, surmounts the cap C. This cover is provided with any convenient number of openings, *o'* *o'*, &c., in order to permit the escape of the hot gases and effect a perfect combustion of the fuel. In the views four openings are shown. Any other form of cover containing suitable air-

openings may be substituted for that described.

The gas-stove is provided on one side at or near its base with an opening, O, of the shape 5 shown, for the purpose of supplying air to the burner. This opening is made of the relative proportions shown in the views, and the vertical height is not quite equal to one-half of the height of the shell. This opening 10 is rounded on the top merely for the purpose of increasing the ornamental appearance of the stove.

Within the stove and directly opposite to the opening O is placed the inclined and corrugated plate P, as shown in the views. 15 This plate is made of some metal having a bright red or yellow color, or is made of sheet-iron washed with copper for the purpose of increasing the ornamental appearance of the stove and its heat-giving effect, and inclines 20 upward at an angle of about forty-five degrees or in a gentle curve from the front of the stove at the base of the opening O to a point under the burner B, Fig. 2. It does not, 25 however, extend as far back as the wall of the shell A, thereby allowing free entry of the air at the back behind the plate through the space p' which is left. The plate P is corrugated merely for the purpose of ornamentation, and a perfectly flat plate similarly 30 placed may be used with equal effect. The plate P is so arranged that the opening or space p' between its upper extremity and the shell A shall be substantially on the same 35 horizontal line as the curved top of the opening O.

The burner, which is designated in the various views by the letter B, will be best understood by reference to the detailed views, 40 Figs. 3 and 4, which describe its parts and construction. The burner B has, generally speaking, the form of an ordinary gridiron. It is provided with a central gas-supply pipe, B', which passes through its entire center, 45 and from which a series of horizontal and parallel pipes, $b\ b\ b$, 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 50 which the gas emerges, and at which point it is ignited and burns.

The pipe B' is made of cast metal of the shape shown, and is of a length equal to the diameter of the shell A of the stove. It is made 55 open at both ends and is turned so as to be slightly larger, and may be supported in the stove in any convenient manner, but in such a manner that the central pipe of the burner shall be made to couple directly by means of 60 the screw-threaded sleeve N, Fig. 5, to the gas-supply pipe in the manner shown.

The horizontal and parallel pipes $b\ b\ b$, &c., are closed at their outer extremities by means of solder or metallic caps, or in any other convenient manner, but are open at the other 65 extremity, and each is provided with screw-threads $b'\ b'\ b'$, &c., on their exterior surfaces,

whereby they may be screwed into the screw-threaded openings $b^2\ b^2\ b^2$, &c., in the side walls of the pipe B', as is shown in Fig. 4. 70

The diaphragm D is composed of a thin sheet of metal, circular in form and slightly smaller than the shell in diameter, and is suspended in the interior of the gas-stove above the burner by means of the straps $d\ d$. These 75 straps are made of thin strips of metal and are bolted to the diaphragm D at the joint d' , and are formed with the bend d^2 at their upper extremities. By means of these straps the diaphragm D is suspended from the upper 80 edge of the shell A in the center of the gas-stove, as shown in Fig. 2, and the heated gases are allowed to pass upward and around it through the space between the circumference of the diaphragm and the shell of the 85 stove.

To permit of the escape of the heated gases a series of openings, $o\ o\ o$, &c., is provided in the shell A, just below the diaphragm D. These openings are all of the same size and 90 are placed upon the same horizontal line, and, being just below the diaphragm, serve to permit free escape of hot gases from the stove at the point where the heat is greatest.

The gas is supplied to the burner B by 95 means of the arrangement of valves shown in Figs. 1 and 5. In these views, S' is the casting or frame of the supply-valve, which is screwed over the outer extremity of the sleeve N. The other extremity is coupled to a bent 100 pipe, S, by means of a coupling, N², with the screw-threaded surface n^9 , fitting into corresponding screw-threaded surfaces n^8 and n^6 on the casting or frame S' and the bent pipe S, respectively. $n\ n$ represent the passages 105 through the sleeves N and N², and m and m' the passage in the valve-frame. h represents the valve-spindle, which is held in place by a washer, h^3 , placed over its extremity, which has a screw-thread, h^5 , turned on it to receive 110 the screw-nut h^4 . h' represents the handle whereby the spindle is turned in the valve-frame, and m' a central passage in the spindle h , connecting the passages $m\ m$. By turning 115 the handle h' the connection between the passages is broken or diminished, and the gas is cut off from the burner or the supply is diminished, as is desired.

For the purpose of igniting the burner an ignition device is provided attached to the 120 supply-valve. The upper part of the valve-spindle h is enlarged, as shown in Fig. 5, and a small passage, k , is provided in the center of it opening into the passage m' . This passage is connected at the top with an ignition-jet, j , provided with the central passage, j' . 125 A small opening, m^2 , in the side wall of the spindle h , which is turned toward the source of supply, connects the passage m' with the passage m at all times, even when the handle 130 is so turned as to cut off the gas from the burner. Through this opening a constant supply of gas enters the passage k . The upper part of the spindle is provided with an

ordinary thumb-piece, i^2 , adapted to actuate the valve i , which is provided with the central passage, i' . By turning the valve i the passage k h^2 is broken and the gas is cut off from the ignition-jet j . A slit or other horizontal opening, T , is placed in the shell A , as shown in Fig. 1, so as to allow the ignition-jet j to enter the stove and ignite the gas when the handle h' is turned. When the handle h' is in the position shown in Figs. 3 and 5, the gas is admitted to the burner B 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 and can enter the passage k only, and will remain burning at the ignition-jet until cut off by the thumb-piece i . When the handle h' is turned back to its former position, the gas will be turned on, and the ignition-jet will approach the burner and ignite the gas. When the stove is burning, the ignition-jet remains burning within the stove, the handle assuming the position shown in Fig. 1.

It will be unnecessary, in view of the foregoing, to describe the method of operation of the stove, as this will be obvious. The direction of the currents of air and hot gas is shown by the arrows indicated in the drawings.

It will be obvious from the foregoing that by means of such a burner as that above described the gas will be burned at a great many places at the same time. This will, consequently, increase the number of points at which the heat is being given forth within the stove. Again, as the burner is of the peculiar gridiron shape, the air can enter between the various arms b b , &c., with the greatest ease and pass up to the various points of ignition and so insure perfect combustion. By means of the arrangement of air-openings and the plate below the burner there is a constant supply of air entering from the front and the back immediately under the burner.

The object of the plate P is to split up the current of air which enters from the front and bottom of the stove through the opening in the front and bottom, and to diminish the draft and supply air equally to the burners, and so prevent smoking at the points of combustion.

The effect of inclining the plate in the manner shown is to increase the draft in the space back of it to such an extent that there will be practically as strong a current of air entering from behind the plate P as enters from in front of it. The effect of the arrangement is to cause the air to enter under the burner from in front and behind in substantially equal amounts and to be equally distributed, so insuring more perfect combustion than without the use of the inclined plate.

The diaphragm D serves to increase the amount of heating-surface, as well as to throw the hot air toward the outer shell of the stove, where it meets the draft created by the openings o o , &c., and o' o' , &c., and is carried up-

ward, heating the upper portion of the shell as it passes.

I claim as my invention—

1. In a gas-stove, the combination, substantially as hereinbefore set forth, with a gas-burner composed of a series of horizontal and parallel gas-supply pipes provided on their upper surfaces with openings or jets for the escape of the gas and connected with a central supply-pipe, of a horizontal diaphragm placed in the interior of the stove above the burner, a space being left around the periphery of the diaphragm for the passage of gases, the exterior shell of the stove being provided with a series of horizontal openings immediately below the diaphragm and one or more openings in the top of the stove above the diaphragm, for the purposes set forth.

2. In a gas-stove, the combination, as described, of a gas-burner composed of a series of horizontal and parallel gas-supply pipes provided upon their upper surfaces with openings for the escape of gas, an inclined plate placed below the burner, an outer shell provided with an opening in the front of the stove and opposite said plate, and an open bottom back of said plate for admitting air to the space back of the same, a space being provided for the passage of air between the top of the inclined plate and the shell of the stove and immediately under the burner, for the purposes set forth.

3. In a gas-stove, the combination, substantially as hereinbefore set forth, with the spindle and handle of the gas-supply valve, of an ignitor having the horizontal hollow igniting-arm j attached to the passage k in the valve-spindle, there being an opening, m^2 , in the walls of the valve-spindle for connecting said passage with the main gas-supply passage, the thumb-screw i' , and the valve i , placed in the passage k for cutting off the gas-supply from the same, so constructed and arranged that the opening of the supplying-valve causes the ignitor to enter the stove and light the burner.

4. In a gas-stove, the combination, with the shell and with the horizontal gas-burner composed of a series of horizontal and parallel gas-supply pipes, of a horizontal diaphragm placed within the stove above and parallel to the gas-burner, said diaphragm being of such size that a passage is left between its periphery and the shell of the stove for the escape of the heated gases, the outer shell being provided with a series of openings in close proximity to the diaphragm for the escape of the heated gases.

5. In a gas-stove, the combination, substantially as hereinbefore described, with the shell of the stove provided with openings in the top above the diaphragm and means for regulating the size of said openings, as described, of a diaphragm placed in the interior of the stove above the burner of such relative size that a passage is left between its periph-

ery and the shell of the stove, the said shell being provided with a series of openings for the discharge of hot gas immediately below said diaphragm.

- 5 6. In a gas-stove, the combination, substantially as hereinbefore set forth, with the shell of the stove provided with the openings *o' o'* in its top and the openings *o o* in its side walls, of the diaphragm *D* in the interior of
10 the stove, so arranged that its periphery shall be in close proximity to and immediately

above said openings for throwing the heated air to the sides of the stove and through said openings.

Signed at New York, in the county of New York and State of New York, this 21st day of November, A. D. 1887.

LANDON KETCHUM.

Witnesses:

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EDWIN T. RICE, Jr.