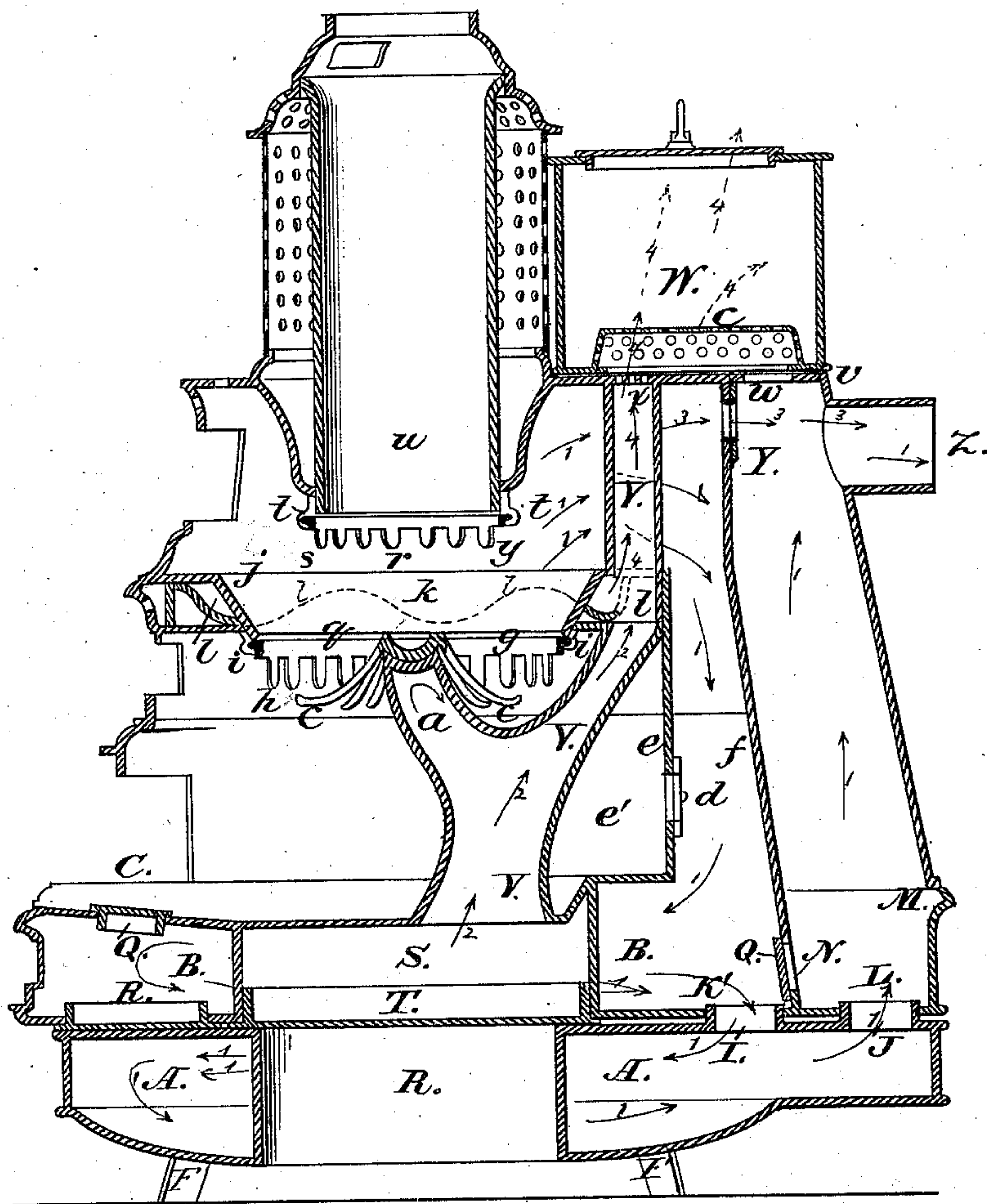


E. SMITH.
Magazine-Stoves.

No. 154,348.

Patented Aug. 25, 1874.

Fig. 1.



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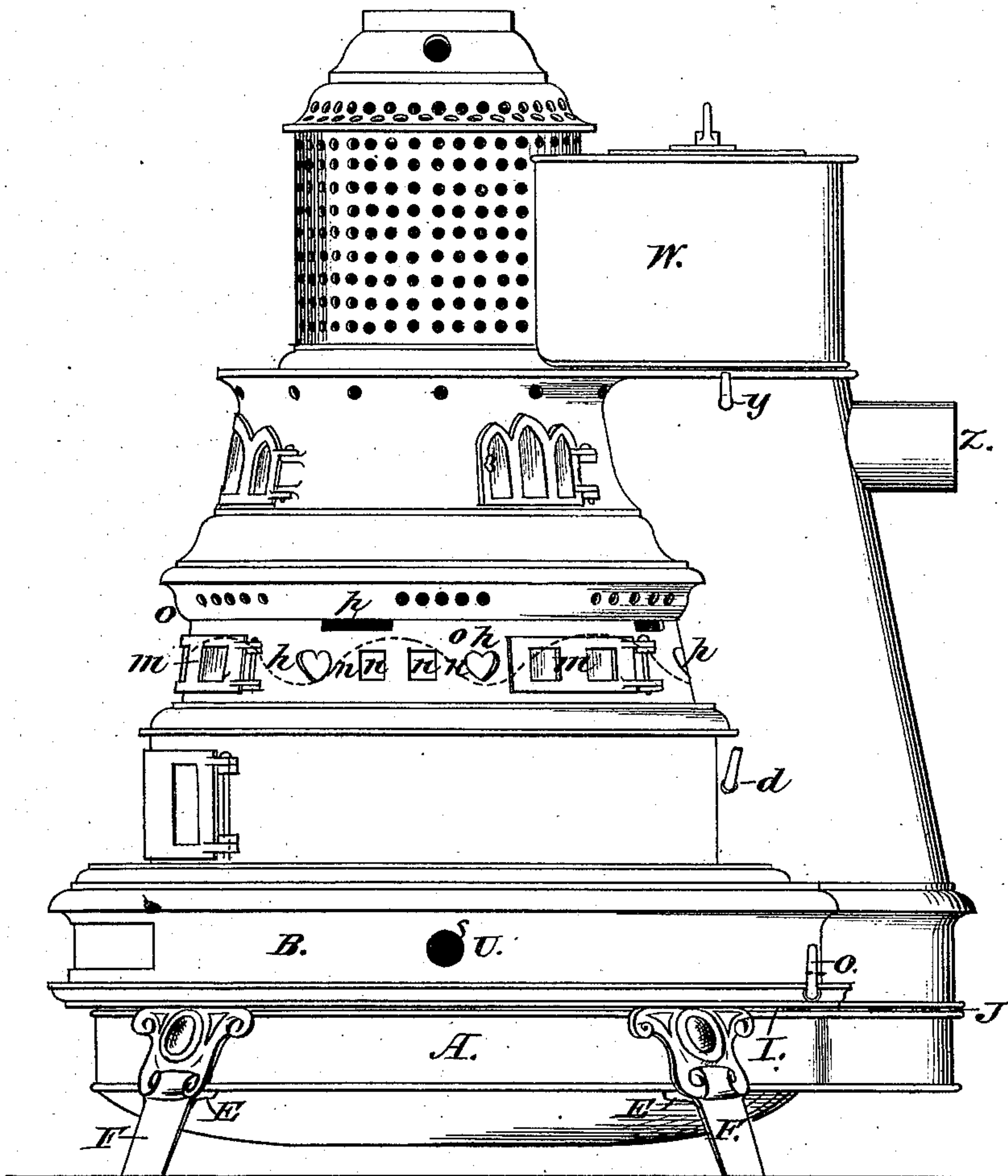
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Fig. 2.



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Fig. 3.

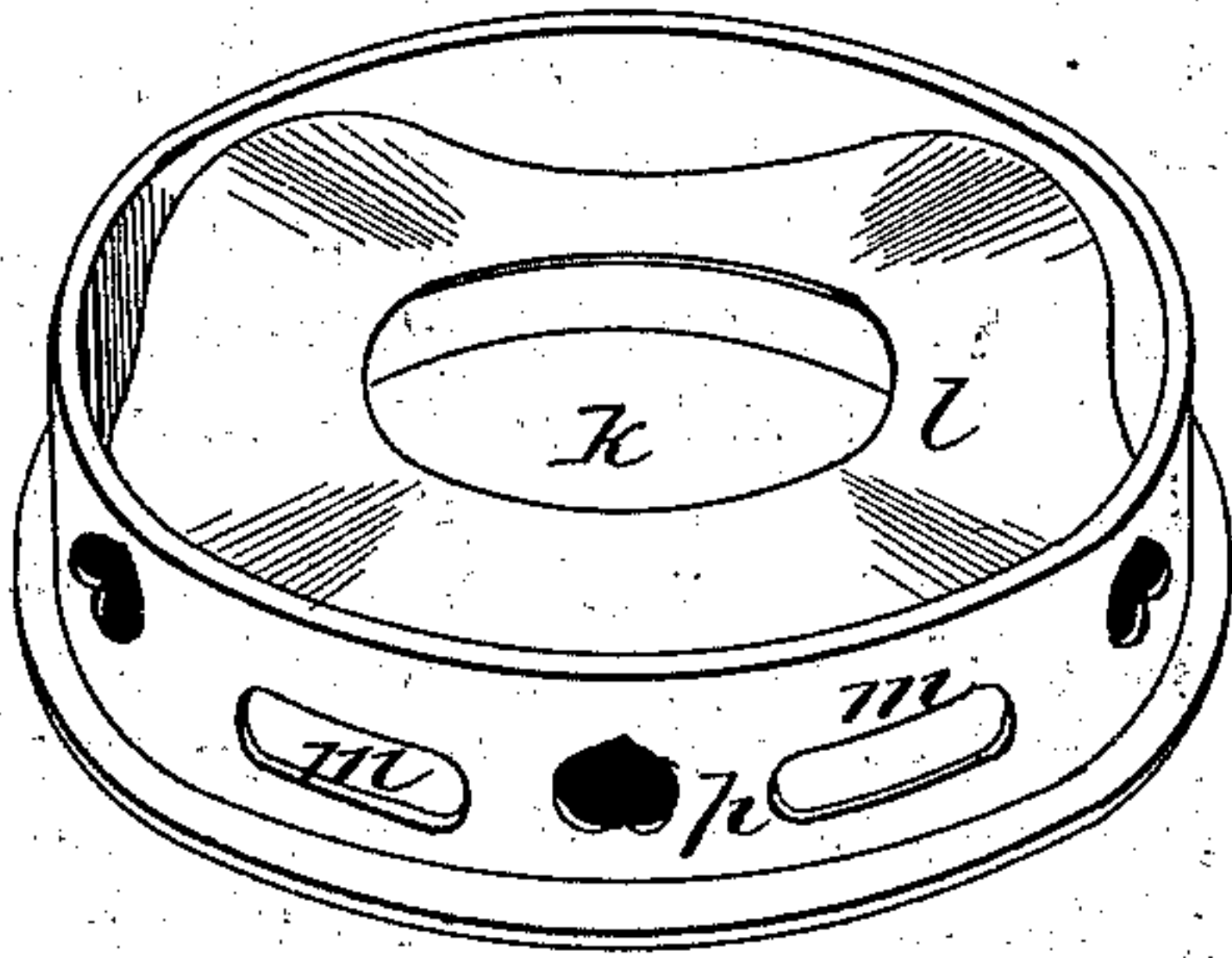


Fig. 4.

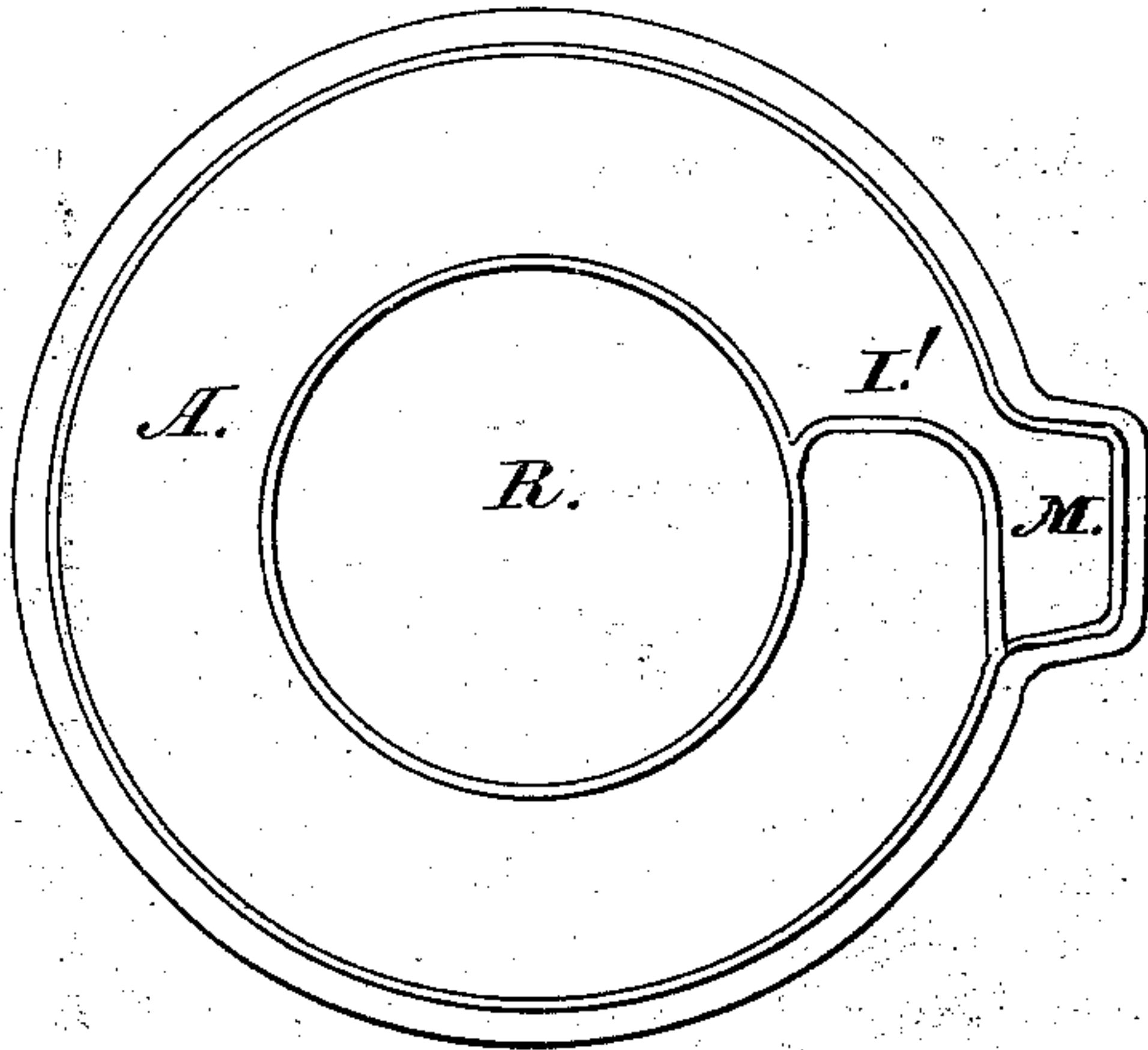


Fig. 5.

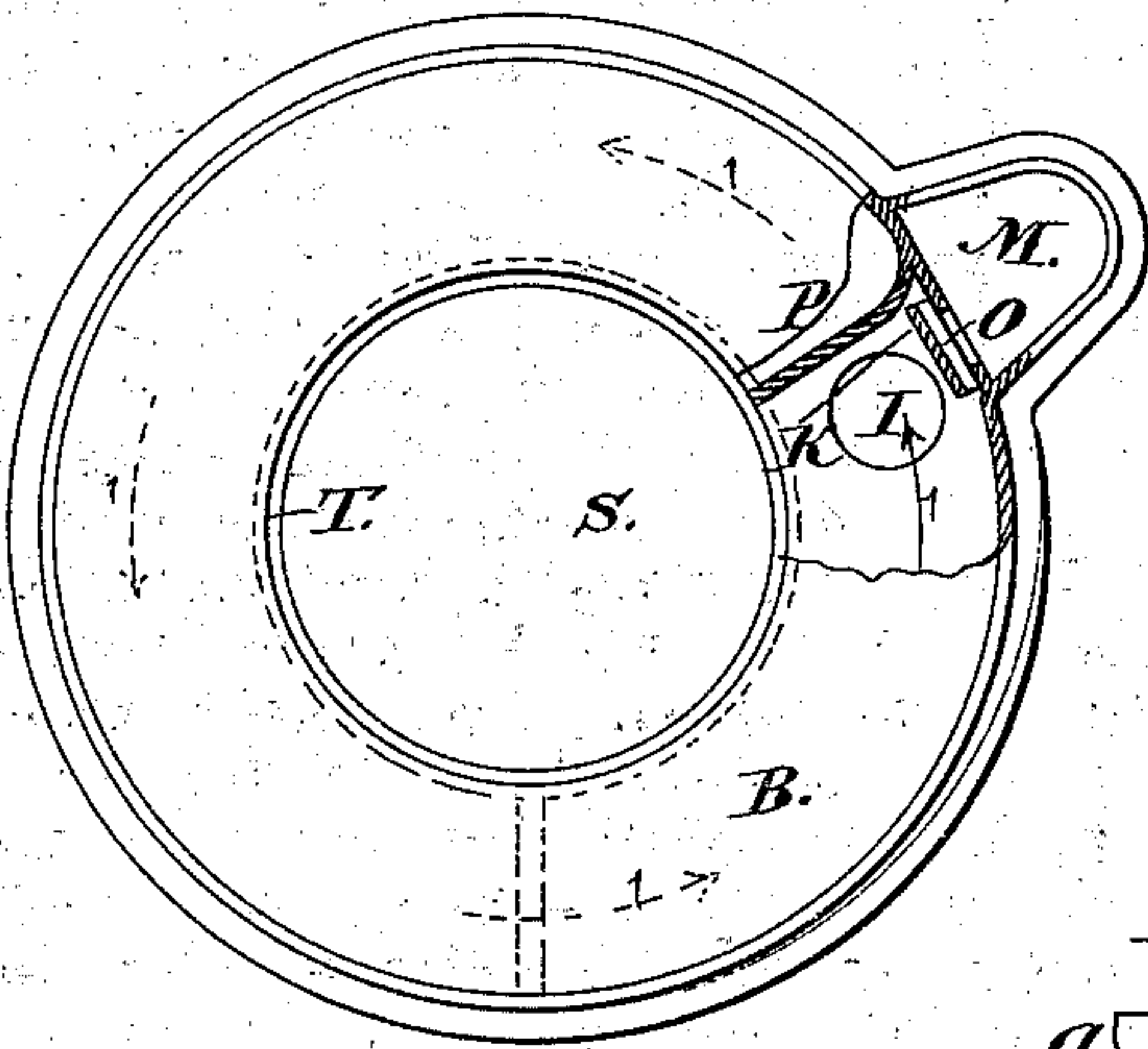


Fig. 6.

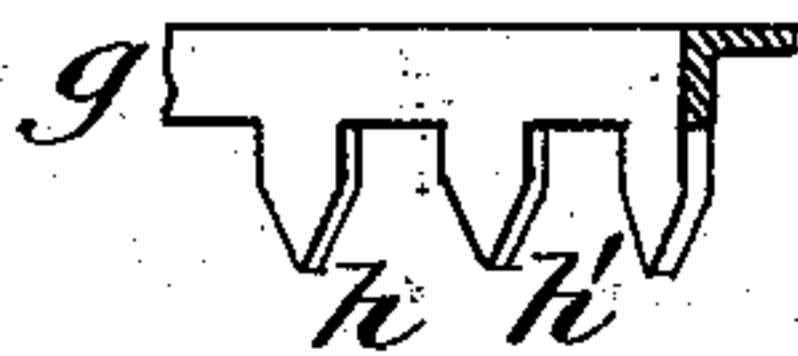


Fig. 7.



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UNITED STATES PATENT OFFICE.

ELIHU SMITH, OF ALBANY, NEW YORK.

IMPROVEMENT IN MAGAZINE-STOVES.

Specification forming part of Letters Patent No. 154,348, dated August 25, 1874; application filed July 17, 1874.

To all whom it may concern:

Be it known that I, ELIHU SMITH, of the city and county of Albany and State of New York, have invented certain new and useful Improvements in Stoves and Furnaces; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is a vertical sectional view. Fig. 2 is a side elevation. Fig. 3 is an inverted perspective view of the alternating hot-air flue. Fig. 4 is a plan of the external detachable base-flue, with its top removed. Fig. 5 is a plan view of the internal base-flue B, and Figs. 6 and 7 are sectional views of the rotary annular rim, showing the independently-movable finger thereon.

This invention relates to certain improvements in stoves and furnaces, and consists in providing a stove or furnace with an external detachable base-flue, which receives the heated gases, &c., from the stove and conducts them to the ascending flue, for the purpose of increasing the heating power of the stove or furnace; in providing a stove or furnace with an internal base-flue, in combination with an external detachable base-flue, and a damper, which controls communication between the said internal and external base-flues and the ascending flue, for the purpose of regulating the heating power of the stove or furnace, by increasing or diminishing the same without removing the external detachable base-flue; in providing a stove or furnace with a bell-shaped grate, the lower central portion of which is convex, supported within the fire-pot upon an arm of a hot-air flue provided with a concave bearing, which permits the grate to be tilted in any direction, for the purposes of directing the burning fuel toward the wall of the fire-pot, and the clinkers to the periphery of the grate, and of increasing the distance between a portion of the periphery of the grate and the wall of the fire-pot, through which space the clinkers may be removed with greater facility; in providing a stove or furnace with a rotary annular rim surrounding the fire-pot, and having a series of fingers depending vertically therefrom, one or more

of which is independently movable on said rim, for the purposes of clearing the fire of ashes, &c., and of permitting an unusually large clinker to be removed through the opening made by turning up the independently-movable finger; in providing a stove or furnace with a rotary annular rim supported directly beneath the lower edge of the coal-reservoir, and having a series of fingers depending vertically therefrom, for the purpose of mixing the unburned coal with the burning coal when the fire is very low, without disturbing the base of the burning coal, and thus endangering the fire; in providing a stove or furnace with an internal hot-air flue surrounding a portion of the fire-pot, having its bottom plate or lower wall made to pass alternately over and between the mica doors and windows in the fire-pot section of the stove, and its external wall provided with perforations and openings through which heated air is discharged directly into the room, for the purposes of securing alternate illumination and radiation from the same annular section of the stove, and of providing access through the doors in said annular section to the grate.

In the accompanying drawings the external detachable base-flue A is placed below the internal base-flue B, which latter is located beneath the annular plate C of the stove. The external detachable base-flue A is provided with the air-space R, and is supported in its position by studs E projecting inwardly from the feet F of the stove. It is only necessary to remove one of the feet F in order to remove or replace the base-flue A. The bottom or lower surface of the external detachable base-flue A slopes downwardly and inwardly, for the purpose of deflecting the heat outwardly from beneath the stove, instead of directly against the floor. The internal base-flue B is provided with a flue-strip P, Fig. 5, which causes the heated gases to make the circuit of said base-flue B before entering the external detachable base-flue A. The base-flue A is provided with collars I J, and a flue-strip, I', which latter causes the heated gases to make the circuit of the base-flue A before entering the ascending-flue M. The internal base-flue B is provided with an opening, K, which re-

ceives the collar I. The collar J enters the opening L in the bottom of the ascending flue M. Communication is had between the base-flue B and the ascending flue M through the opening N. When the damper O is turned down the heated gases, &c., do not then enter the external detachable base-flue A, but when the damper O is turned up it closes the opening N, and the heated gases, &c., pass (see arrows 1) from the base-flue B, into which they have been conducted by the descending flue *f* (see arrows 1) to the external detachable base-flue A, through I K, make the circuit of the said flue A, and pass through J L to the ascending flue M, thence out at the exit-flue Z. When the external detachable flue A is removed the opening I is closed by turning down the damper O, and the opening J is closed by a cap or thimble. The heated gases, &c., then traverse the internal base-flue B, and pass through the opening N to the ascending flue M, and thence through the exit-flue Z to the chimney. The base-flue B has removable caps Q and R, covering openings through which, when the caps are removed, access may be had to the flue B for cleaning it. An air-chamber, S, in the base-flue B is closed by a cap, T, and air is admitted to said chamber S through a tube, the open end U of which is shown in Fig. 2. As the air becomes heated it passes up the hot-air flue V (see arrows 2) into the air-flue *k* surrounding a portion of the fire-pot. The upper portion of the hot-air flue V leads (see arrows 4) from the internal hot-air flue *k* to the top plate *v* of the stove, and conducts the hot air, which does not escape through the perforations *o* and openings *p*, through the perforations *x* into a boiler or oven, W, or into the room if the plate *v* be unoccupied. A damper, Y, in the partition that separates the descending and ascending flues *f* and M, permits a direct draft (see arrows 3) from the fire-pot to the exit-flue Z, when said damper Y is open. The arm *a* of the hot-air flue V forms the support for the bell-shaped grate *c*. The central portion of the grate *c* is convex on the lower side, and this convexity enters a concavity in the upper end of the arm *a*, thereby forming a joint which permits the grate *c* to be tilted in any direction without displacing it from its central support. The points of the grate-bars are curved slightly upward to prevent the coal from running over the edge of the grate *c* when in its proper position. By inserting a poker through one of the doors *m*, and pushing upon the periphery of the grate *c*, it can be tilted so as to increase the distance between a portion of its periphery and a portion of the wall of the fire-pot, and through the increased space created by this operation the clinkers, &c., can be readily dumped into the ash-pan beneath the grate. The rotary annular rim *g*, having a series of fingers, *h*, depending vertically therefrom, rotates in bearings *i* secured to the lower edge

of the fire-pot *j*. By rotating the rim and fingers *g h*, which may be done by inserting a poker through one of the doors *m*, the fire can be cleared of ashes, &c., without disturbing the grate *c* to any great extent. One or more of the depending fingers *h'* is independently movable upon the rim *g*, and may be turned up to make a larger opening between the fingers for the removal of an unusually large clinkers. The internal annular hot-air flue *k* surrounds a portion of the fire-pot *j*, and has a bottom plate or lower wall, *l*, which passes alternately over and between the mica doors *m* and windows *n*. The outer casing of the stove forms the outer wall of the flue *k*, and is provided with perforations *o* and openings *p*, through which heated air is discharged from said flue *k* directly into the room. The upper portion of the hot-air flue V conveys that portion of the hot air which does not escape through the openings *p* and perforations *o* through the perforations *x*. Illumination is secured between the vertical fingers *h*, and the space *q* between the lower edge of the fire-pot and upper surface of the rim *g*. A series of vertical fingers, *r*, depending from an annular rim, *s*, supported in bearings *t* secured to the lower edge of the coal-reservoir *u*, are used to mix the unburned coal with the burning coal, when the fire is very low, without revolving the rim and fingers *g h* or the grate *c*, either of which latter operations would endanger the fire by reason of their tendency to shake it into the ash-pan. *w* is a boiler-seat, which may be opened to receive an appropriate cooking utensil. The casing surrounding the reservoir *u* is perforated, and the heated air from this portion of the stove is discharged directly into the room. *e* is the ash-wall of the stove, and *d* a damper controlling the communication between the ash-chamber *e'* and the flue *f'*.

Having thus described my improvements, what I claim as new and useful, and desire to secure by Letters Patent, is—

1. In combination with a stove or furnace, the external detachable base-flue A I I' J, operating substantially as and for the purpose hereinbefore set forth.

2. In combination with the internal base-flue B P of a stove or furnace, the external detachable base-flue A I I' J, and the damper O for controlling the openings K and N, substantially as and for the purposes set forth.

3. The bell-shaped grate *c* supported within the fire pot *j*, in combination with and upon the arm *a* of the hot-air flue V, by a concavo-convex joint, which permits the said grate to be tilted in any direction, as and for the purposes set forth.

4. The rotary annular rim *g*, provided with the vertically-depending fixed fingers *h*, and a finger, *h'*, (one or more,) which is independently movable thereon, in combination with the fire-pot *j* and the grate *c*, as and for the purposes hereinbefore set forth.

5. The rotary annular rim *s*, provided with the vertically depending fingers *r*, supported in bearings *t* immediately below, and in combination with, the coal-reservoir *u*, as and for the purpose set forth.

6. In a stove or furnace, the internal hot-air flue *k*, having its bottom plate or lower wall *l* curved alternately over and between the doors *m* and windows *n*, and its outer wall provided with perforations *o* and openings *p*, in combination with the fire-pot *j*, doors *m*,

and windows *n*, as and for the purposes set forth.

In testimony that I claim the foregoing improvements, as above described, I have hereunto set my hand and seal this 2d day of July, 1874.

ELIHU SMITH. [L. S.]

Witnesses:

F. L. PERLEY,

THEODORE MUNGEN.