

J. Old.  
Heating Stove.

N<sup>o</sup> 110,274.

Patented Dec. 20, 1870.

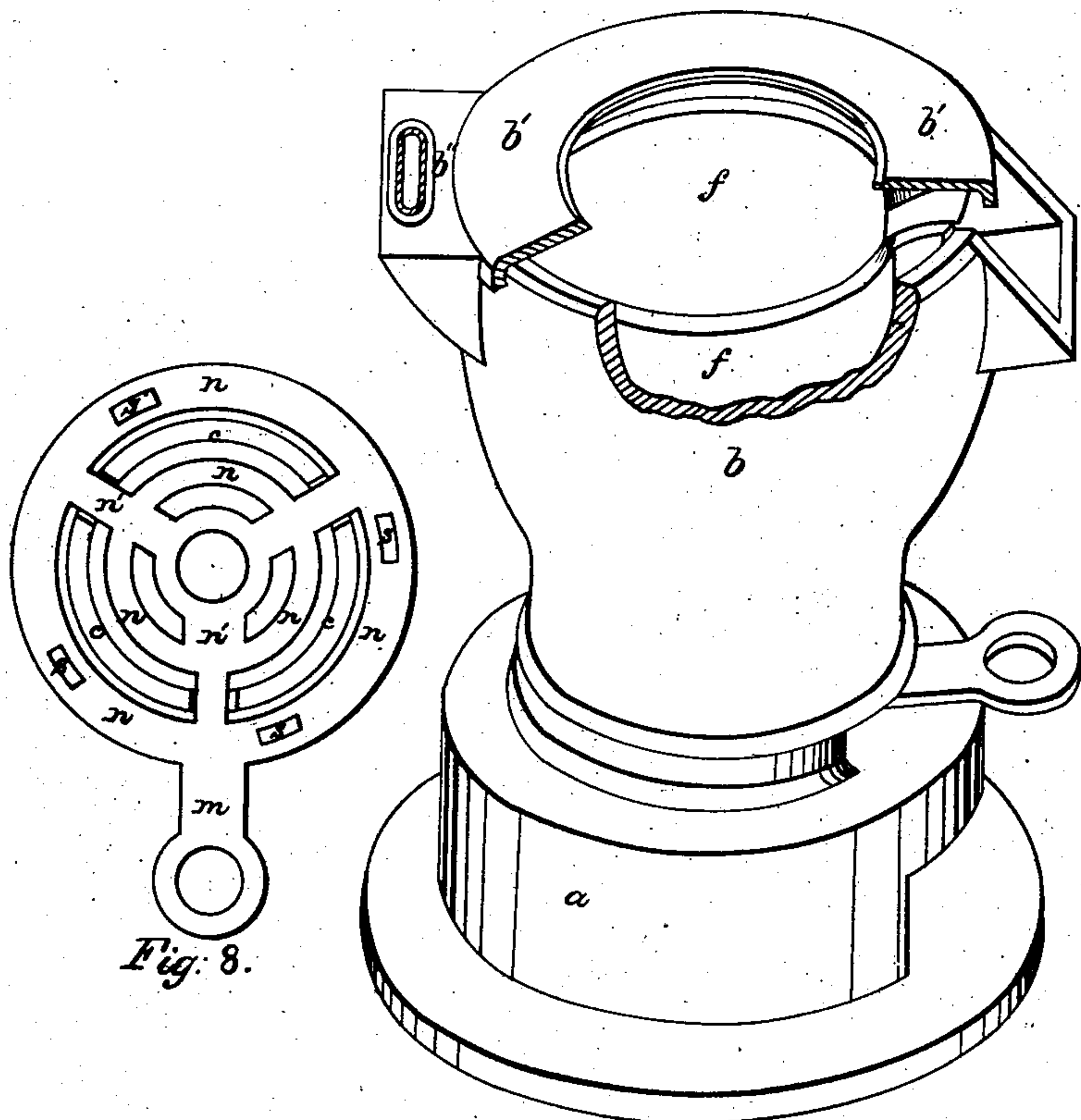


Fig. 1.

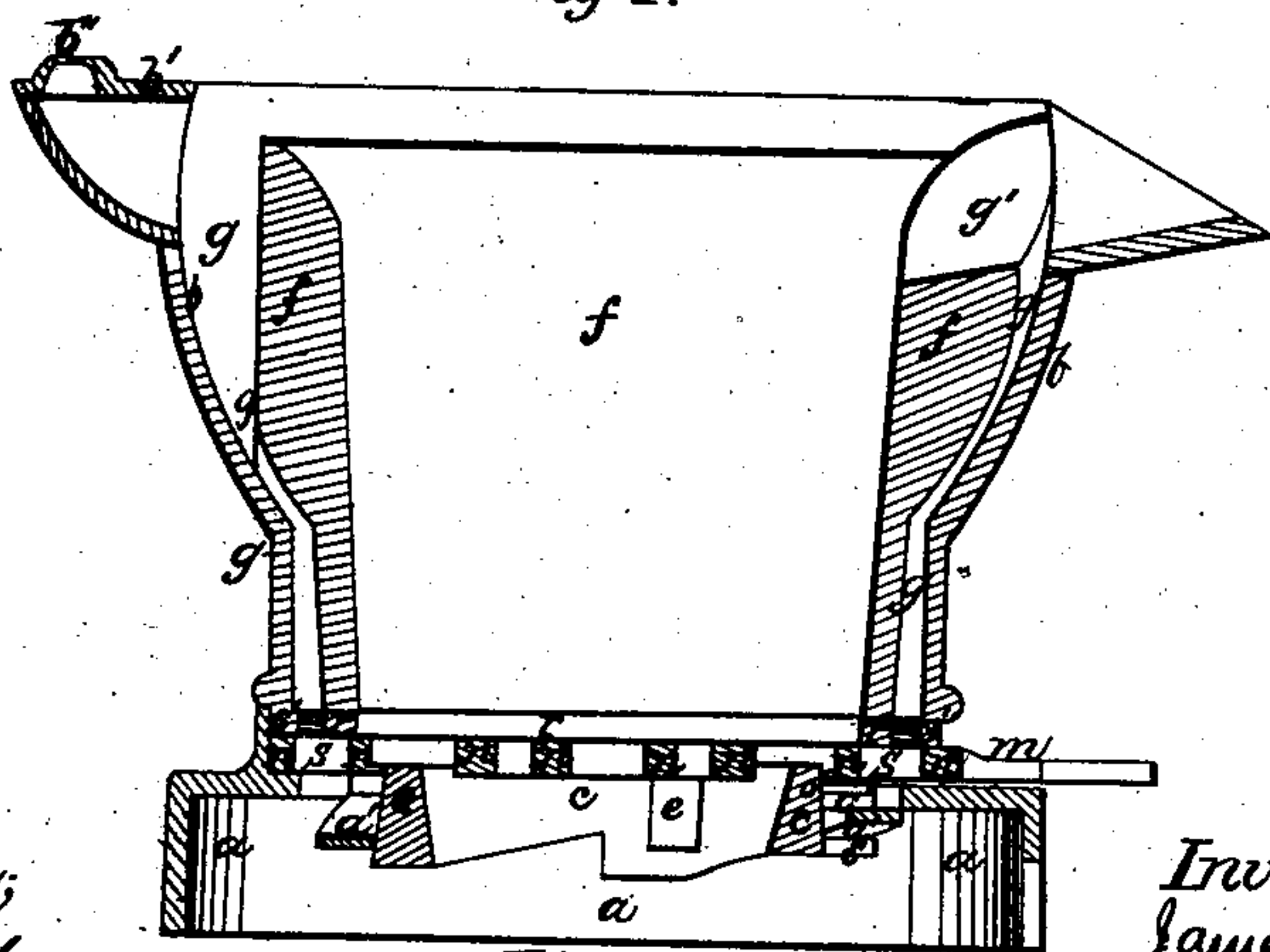


Fig. 2.

Witnesses;  
R. B. Ormskell  
Thos. Bakewell Kemp

Inventor;  
James Old,  
by Bakewell & Knistly  
his Attys.

J. Old.  
Heating Stove.

No. 110,274.

Patented Dec. 20, 1870.

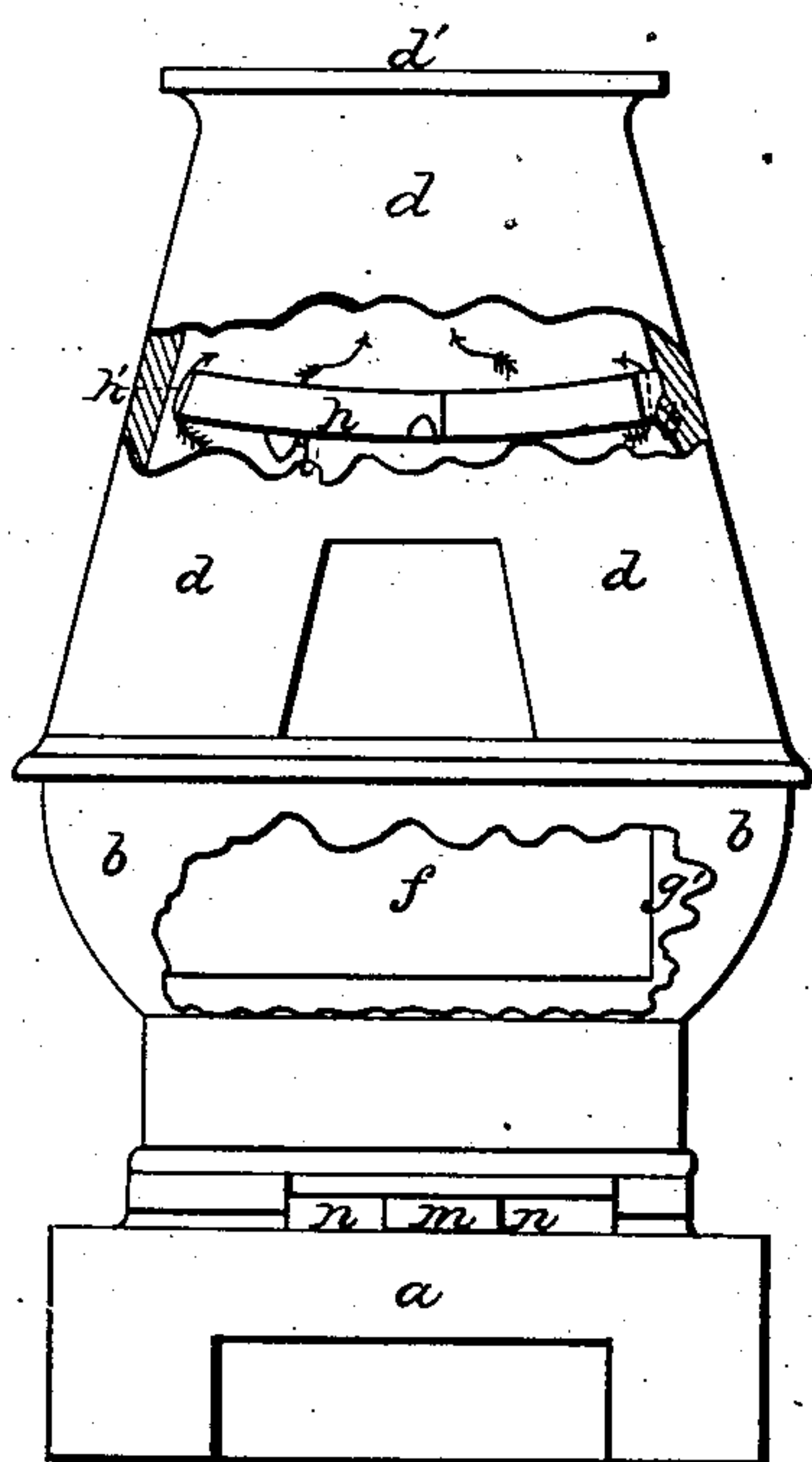


Fig. 3.

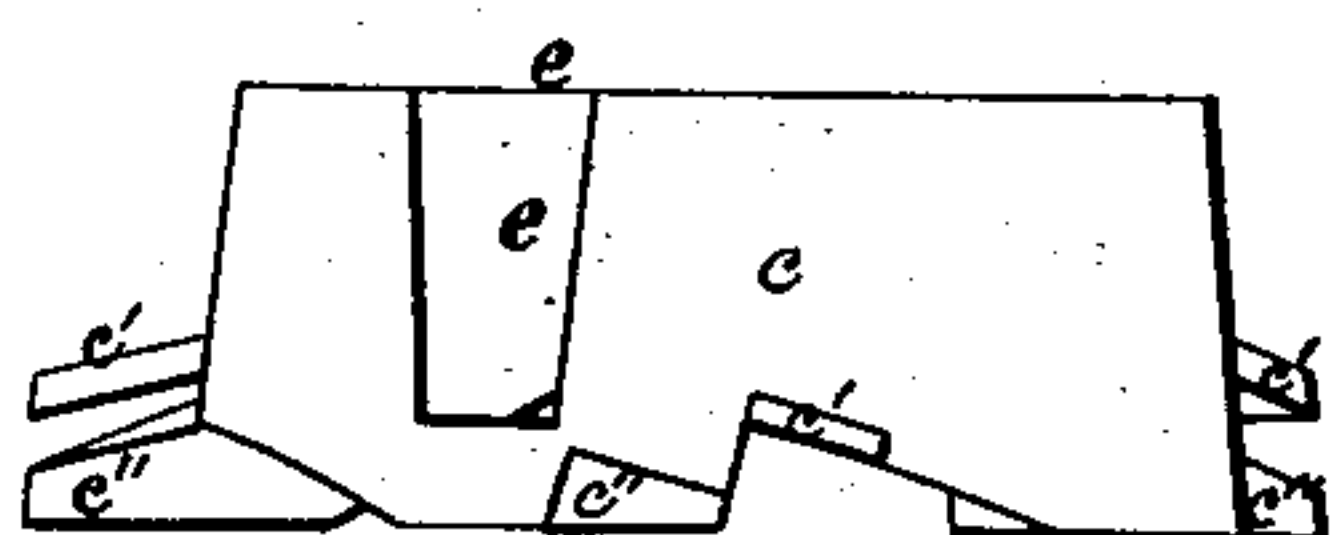


Fig. 5.

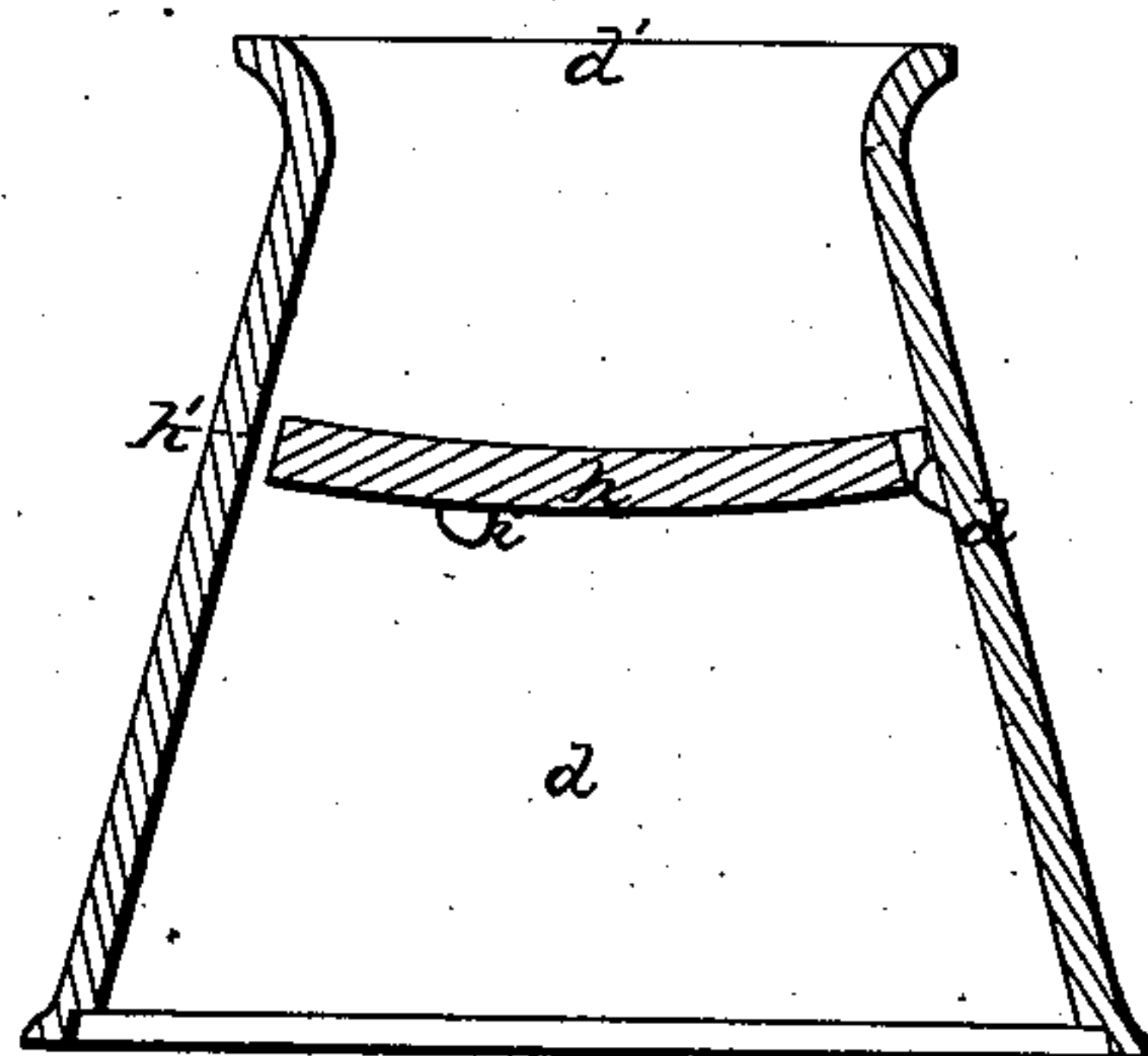


Fig. 4.

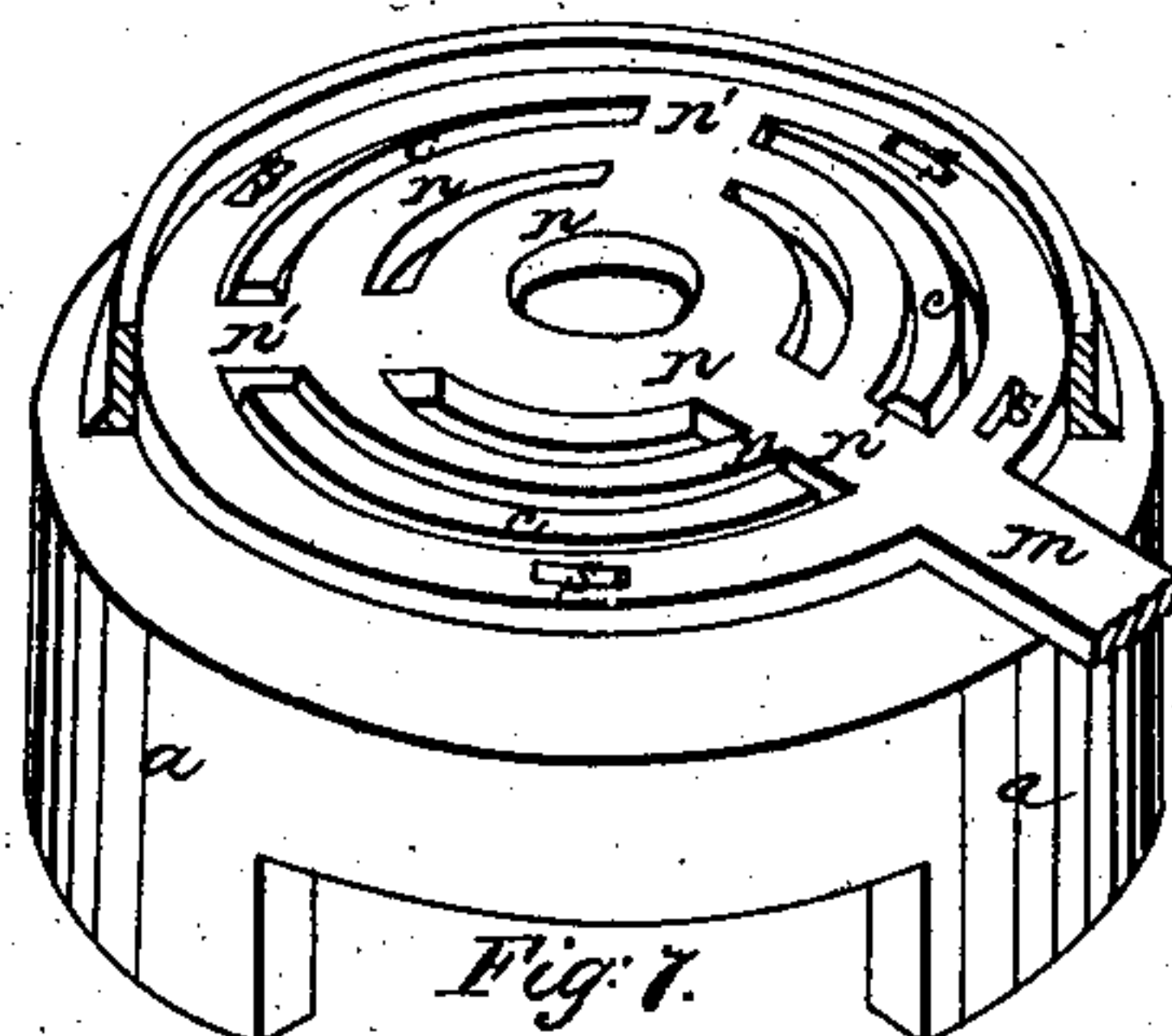


Fig. 7.

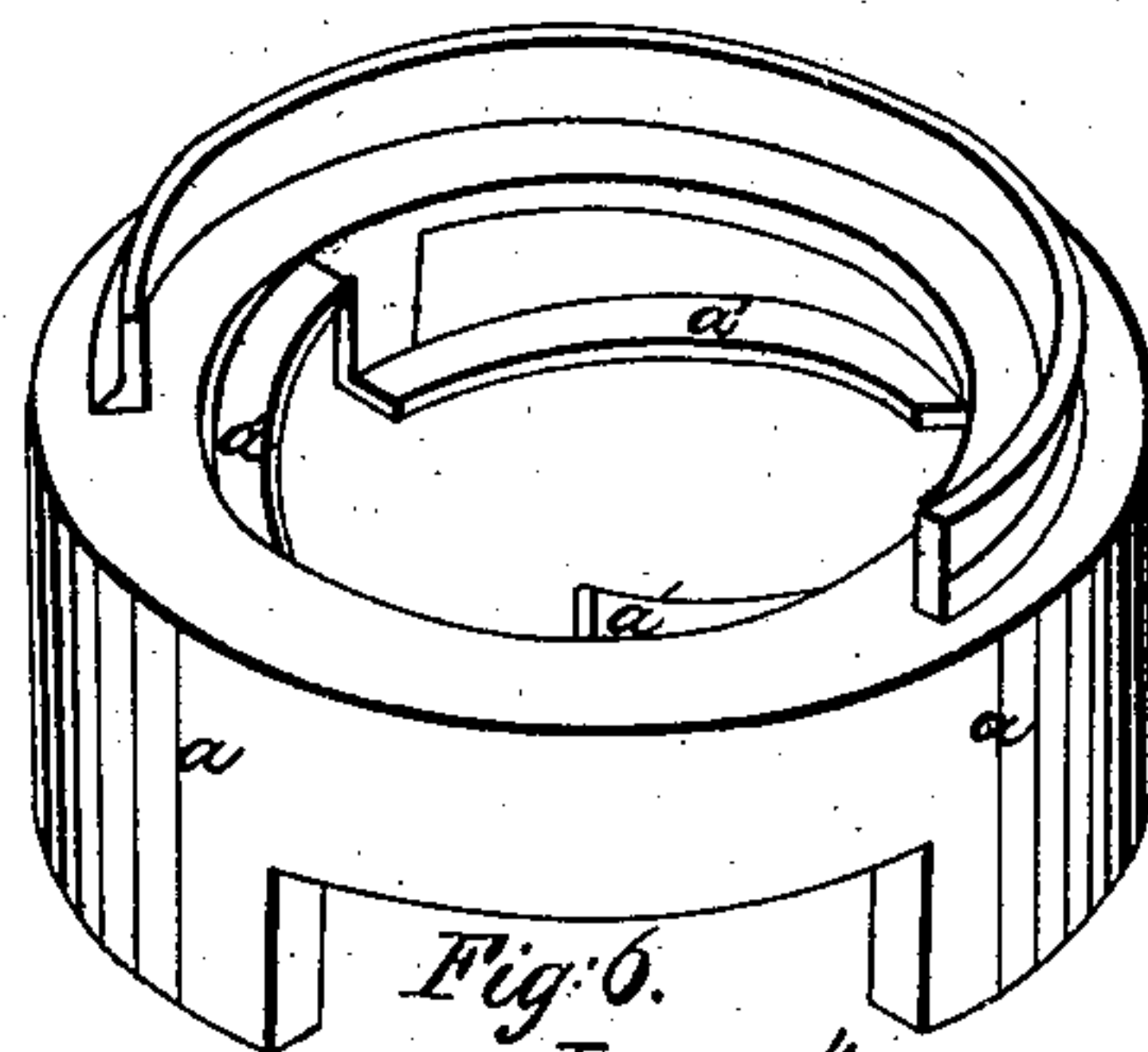


Fig. 6.

Witnesses;  
R. C. Wrenshaw

Thos. Bakewell Herd

Inventor;  
James Old,  
by Bakewell Christy,  
his Attys.



# United States Patent Office.

JAMES OLD, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 110,274, dated December 20, 1870.

## IMPROVEMENT IN FURNACE-STOVES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JAMES OLD, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Stoves; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, in two sheets, in which—

Figure 1 is a perspective view of my improved furnace-stove;

Figure 2 is a sectional view thereof;

Figure 3, (sheet 2,) a front view of the same, with conical top;

Figure 4 is a sectional view of the stove-top of fig. 3;

Figure 5 is a side view of the rotating grate-ring;

Figure 6 is a perspective view of the ash-pit;

Figure 7 is a like view of ash-pit, rotating-ring, and circular grate; and

Figure 8 (sheet 1) is a plan view of the ring and grate.

Like letters of reference indicate like parts in each.

My invention relates to improvements in upright cylindrical and egg-shaped stoves, and stoves having the form of an inverted cone, commonly known as furnace-stoves; and consists in an improved construction of grating, and an improved arrangement of fire-pot, air-flues, and reverberating cover.

To enable others skilled in the art to make and use my improvement, I will proceed to describe its construction and mode of operation.

In figs. 1 and 2, *b* is the casing or shell of the stove, and *b'* the top-plate.

Inside the shell is a fire-pot, *f*, made of fire-clay or other suitable material, and of any desired form, the upper open end of which comes quite near to the top-plate *b'*, leaving sufficient room, however, for the smoke, gases, &c., from the fire to pass over the upper edge of the fire-pot *f*, along the upper part of the chamber *g'*, and escape at the smoke-hole *b''*.

Through an arrangement of dampers, presently to be described, air is supplied, when desired, by grooves or air-passages *g*, fig. 2, which pass up between the fire-pot *f* and the shell *b*, and supply air, through the chamber *g'*, to the fire at the upper edge of the fire-pot, the better to effect the combustion of the otherwise unconsumed carbon.

The kettle or boiler containing whatever is to be heated is placed in the stove-hole shown in fig. 1, so that its lower end shall come inside or directly over the fire-pot *f*, the edges of which come well up around the kettle, and bring the heat and flame in contact therewith before the latter can escape through the pipe hole *b''*.

In fig. 3 I have shown a similar arrangement of fire-pot *f* and lower shell *b*, applied to an egg-shaped stove,

in which *d* represents the upper conical part of the shell, and *d'* the point of exit for the smoke.

In such stoves, that is, upright shell-stoves, of egg-shape, cylindrical, or other like form, I introduce a reverberatory tile, *h*, directly over the fire-pot *f*, in a horizontal position, suspend it on the inwardly-projecting lugs *i* of the shell *d*, but so as to leave a smoke-flue, *h'*, extending all around between the edge of the tile *h* and the shell *d*, except where the lugs *i* are arranged. The effect of such a tile so arranged in promoting the combustion of smoke and gases, and preventing the rapid escape and waste of heat, is already well known in the art. It also has the effect to throw the inside heat against the shell of the stove, and so increase the outside radiation of heat from the stove.

In the bottom part of the stove *a* represents a cylindrical box, which constitutes the ash-pit, and is made of a diameter about equal to or a little in excess of the diameter of the circular grate, presently to be described.

On the inside of the ash-box *a* are cast a series of inclines, *a'*, (fig. 6,) three or more in number.

Immediately inside the ash-box *a* an annular ring, *c*, (fig. 5,) is arranged by means of lugs *c' c''*, one, *c'*, of each set operating on the upper part of one of the inclines *a'*, and the other, *c''*, on the lower face, so as to hold such ring securely in position, as it goes up and down, under the effect of a rotary motion imparted to it, as presently to be described.

The upper face or end of this ring *c* constitutes a part of the grating, as shown in figs. 7 and 8, and when rotated its lugs *c' c''*, acting on the inclines *a'*, cause it to act, in stirring, agitating, or shaking up the fire, by a compound rotary and vertical motion. This ring *c* I arrange so that it shall operate at or near the face of the fire-pot, so as to stir the fire at that part of the fire-chamber, prevent the coking of the coal on the inside face of the fire-pot, and promote the combustion thereof at the outer edge of the fire. This is an important feature of my improvement, since it secures the most rapid combustion next the shell of the stove, where the heat developed is most economically applied, the fuel at the center of the fire-chamber being disturbed but little, if at all.

This agitating-ring is notched or recessed at two or more suitable points as at *e*, in which notches the radial bars *n'* of the circular grating *n n'* operate. This grating *n n'* may be of any desired construction, provided only that it be capable of rotating, and be of suitable form or have suitable devices for engaging the ring *c* and imparting to it a rotary motion.

The grating *n n'* has a handle, *m*, by which it may receive the motion described, or a removable handle may be inserted in the usual way. Then, as the grating *n n'* is caused to rotate intermittently and alternately in opposite directions, its radial bars *n'*, engaging the



ring *c* by its notches *e*, cause the ring to rotate by a like motion, and also move up and down, by means of its lugs *c'* *c''* operating on the inclines *a'*.

While claiming the devices described and their mechanical equivalents for imparting a vertical and rotary motion to the ring *c*, I also claim the ring *c*, when so constructed and arranged as to operate in shaking or agitating the fire by a direct vertical motion, whether such direct vertical motion be effected by a lever or other equivalent device, as I am not aware of a prior construction or use of a vertically-moving annular ring as a part of a stove-grate.

The ring *c* may be cast in one piece or in sections, and such sections be bolted together, or so connected with the agitating devices as to move together in producing the effects above described.

The outer ring of the grating *n n'*, which comes under the fire-pot *f*, has a series of air-passages, *s s*, which correspond in number and arrangement with the grooves *g* in the sides of the fire-pot *f*, and with air-passages *s' s'* in the ring *r*, on which the fire-pot rests. Then, by shifting the lever *m*, the air-passages *s s* and grooves *g* can be made to correspond, so as to furnish a supply of air to the fire at the upper mouth of the fire-pot *f*, as above described, or such supply may be cut off at pleasure.

The edge of the fire-pot *f* (fig. 1) next the smoke-hole *b'* may come up in contact with the top-plate *b'*, the better to retard the escape of the heat, if so desired.

I am aware that reverberatory covers have been used in connection with open-front stove and fire-place grates; also, that such cover has been combined, in a sheet-iron topped stove, with a contracting or tapering throat, which leads from the annular space around the

cover to the center of the chamber above, as shown in patent to A. J. Redway, dated 29th September, 1868. I hence disclaim such arrangement, and limit myself in this part of my invention to the arrangement set forth in the last of the claims hereunto annexed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A rotating grating, *n n'*, the outer ring of which has air-passages, *s s*, in combination with air-passages leading thence to an annular chamber, *g'*, between the fire-pot *f* and stove-shell *b*, substantially as described.

2. A ring, *c*, the upper end of which forms a part of the stove-grating, when combined therewith so as to operate, by a direct vertical or vertical and rotary motion, in agitating the fire, substantially as set forth.

3. The ring *c* and ash-pit *a*, the one having an arrangement of lugs, and the other a corresponding arrangement of inclines, for securing a vertical and intermittent rotary motion of the ring, substantially as described.

4. The circular rotating grate *n n'*; in combination with the devices of the last foregoing claim, arranged substantially as set forth.

5. In a cast-metal stove-top, *d*, a reverberatory tile, *h*, hung on supporting-lugs *i*, substantially as described, so as to leave an open chamber above as well as below such tile, and thereby secure the maximum radiation of heat.

In testimony whereof I, the said JAMES OLD, have hereunto set my hand.

JAMES OLD.

Witnesses:

A. S. NICHOLSON,  
G. H. CHRISTY.