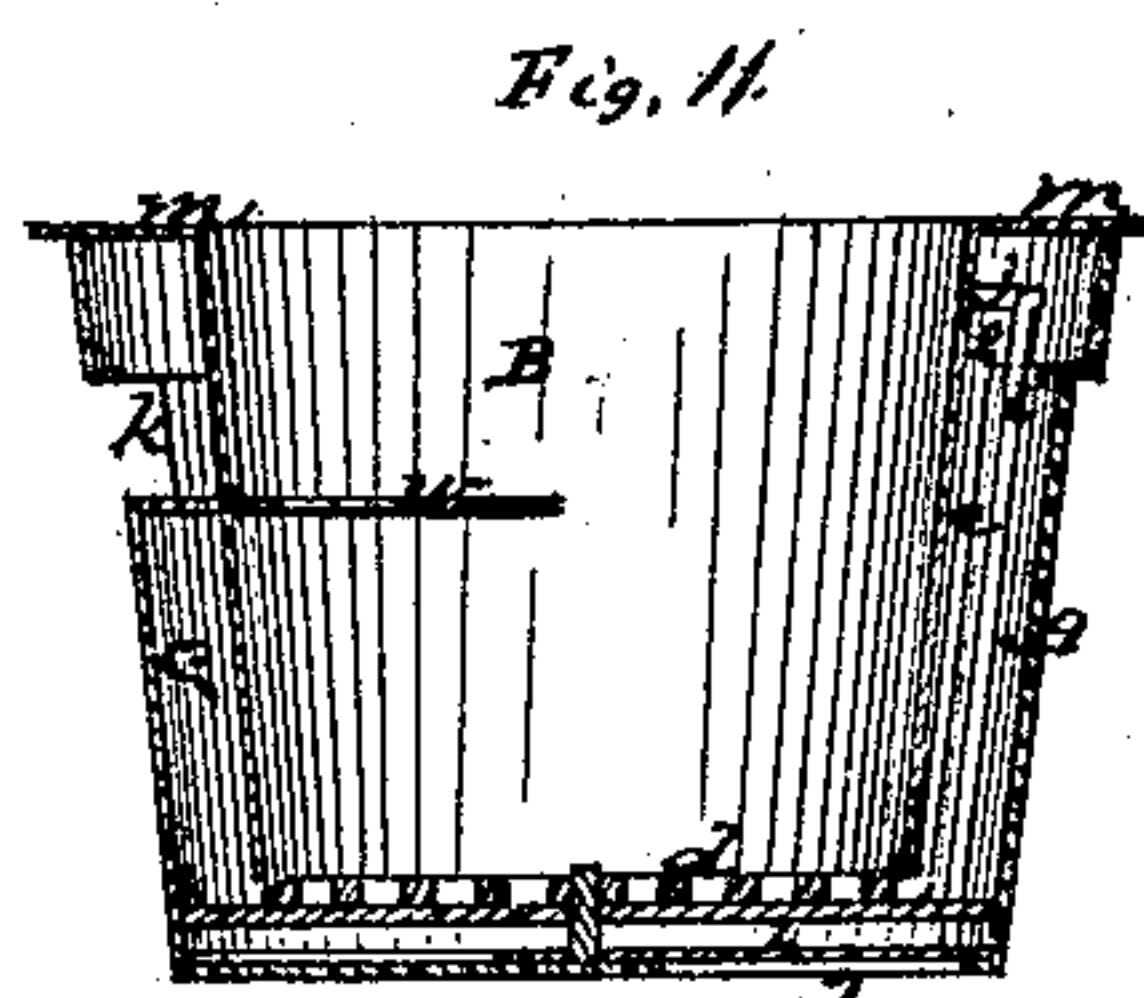
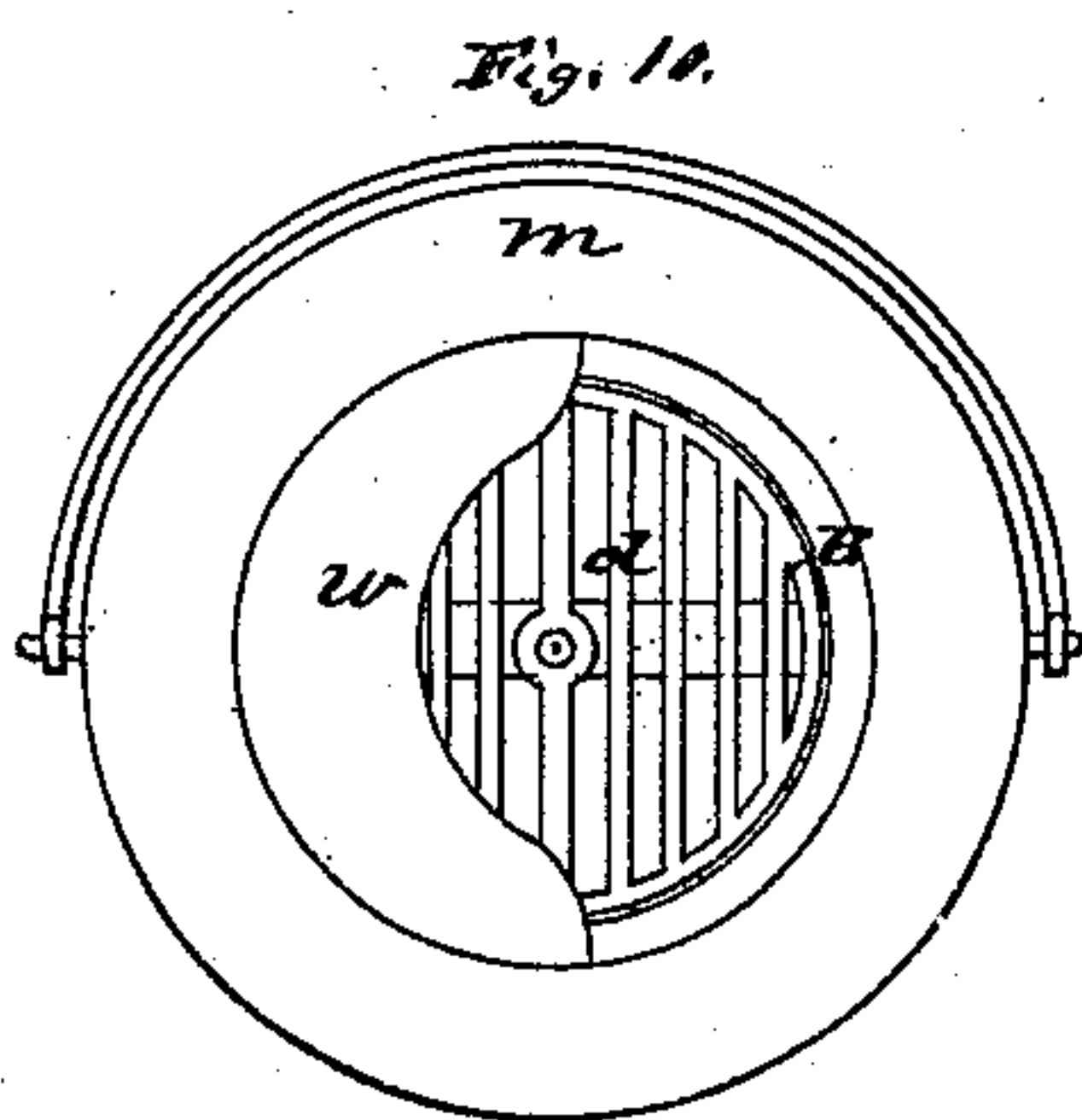
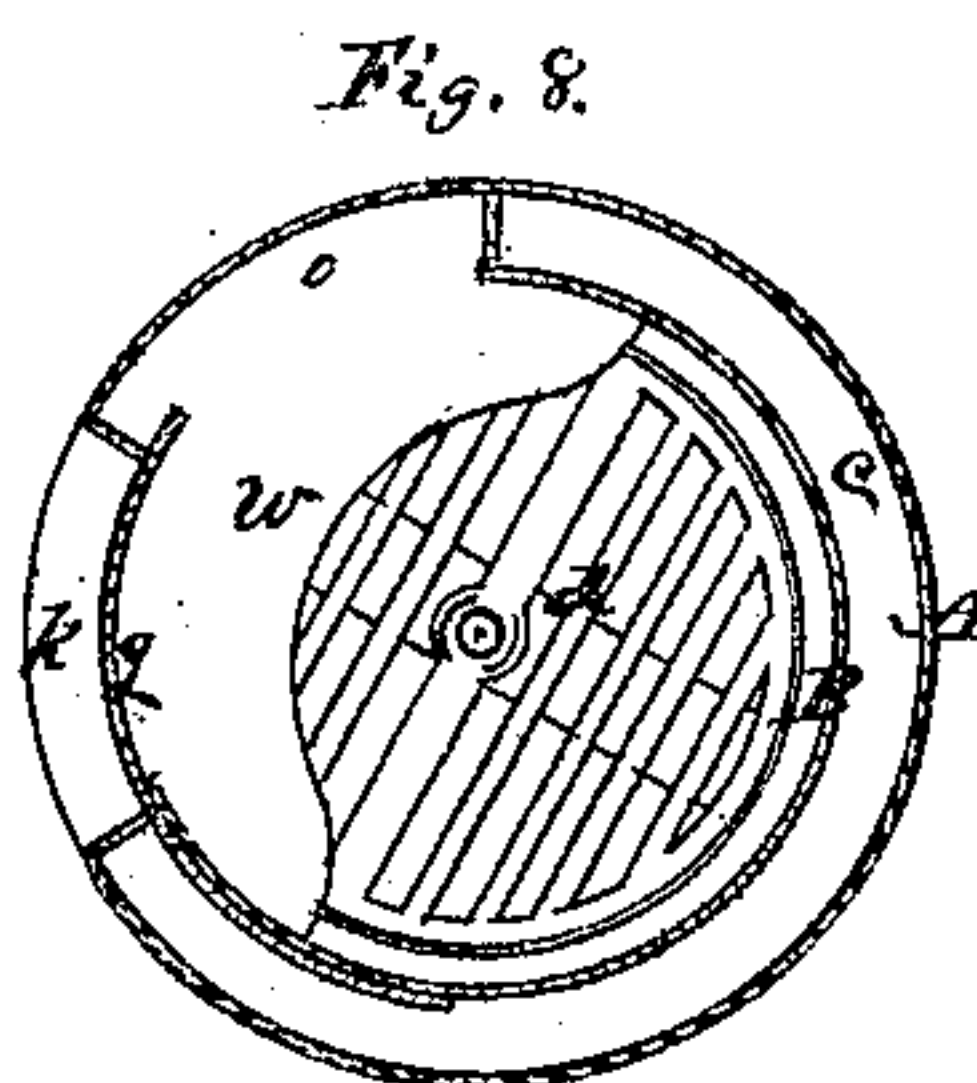
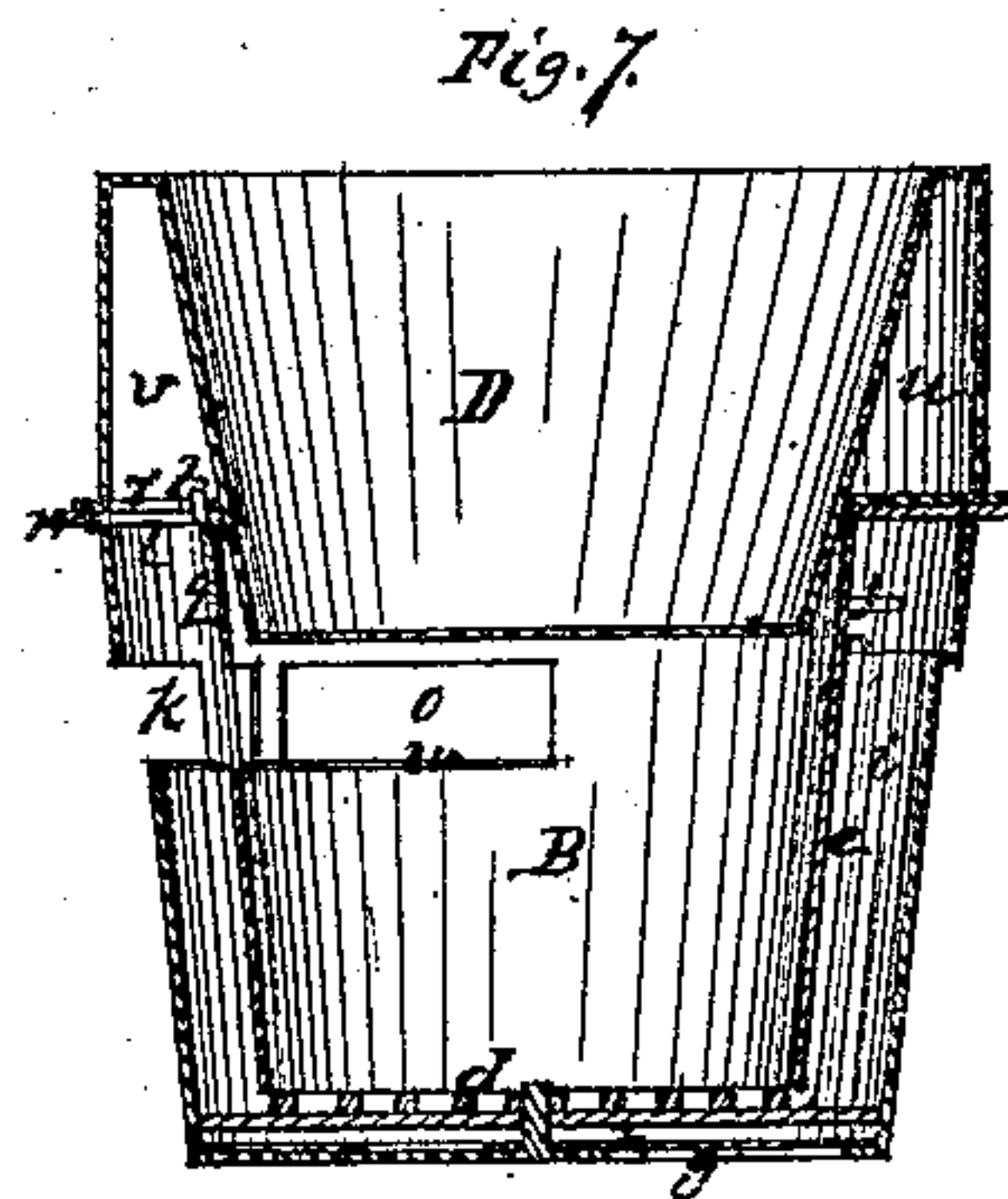
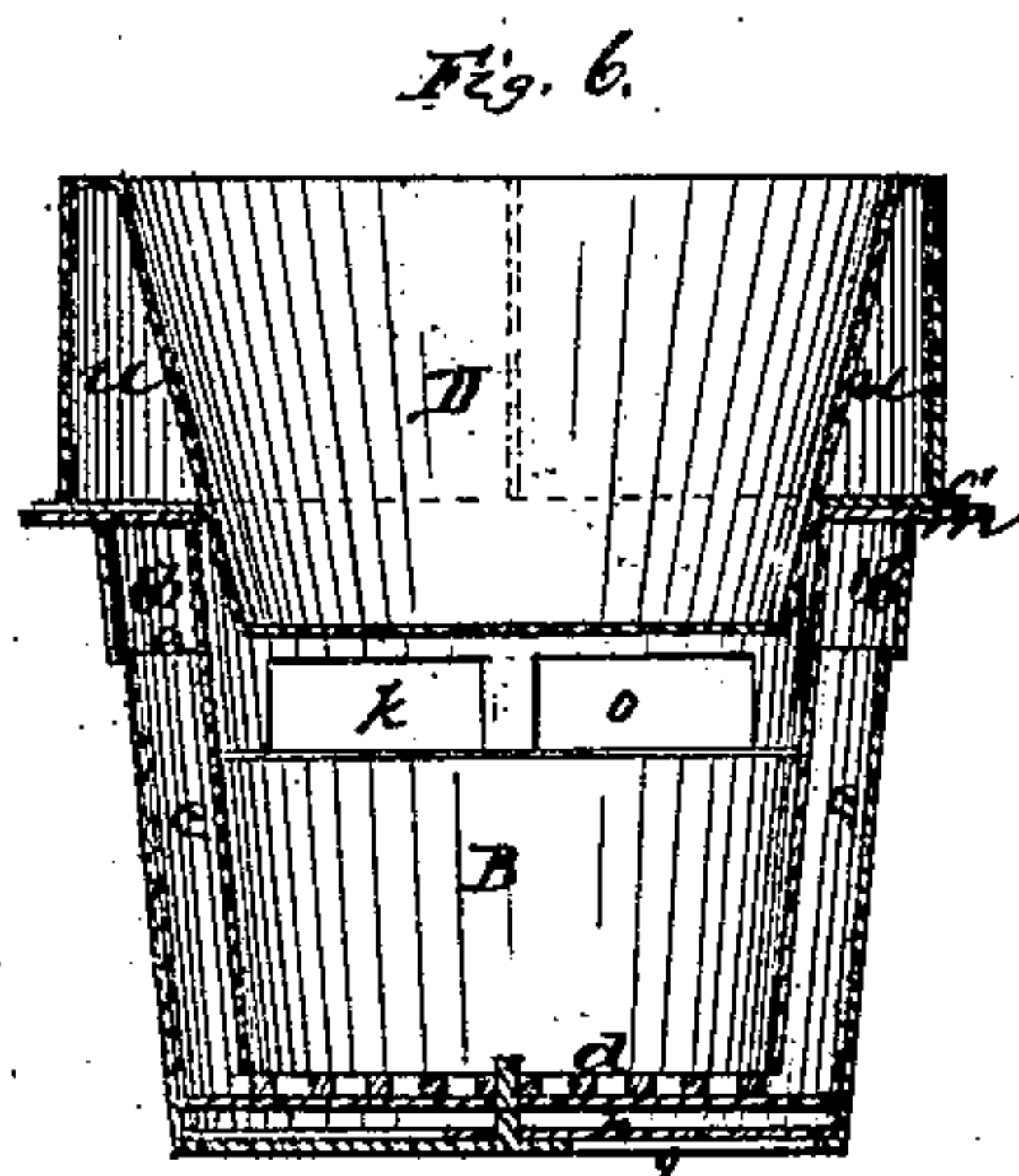
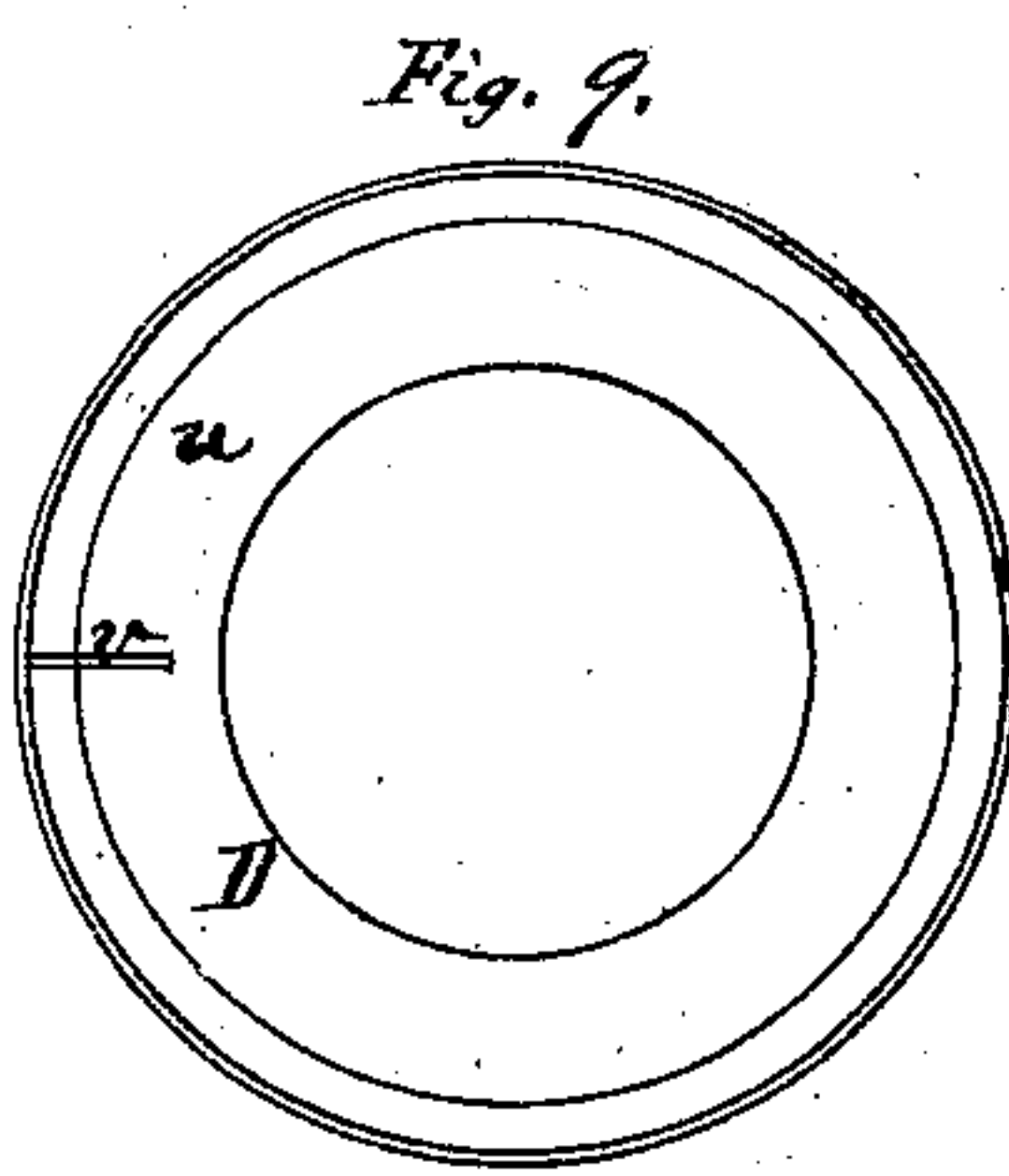
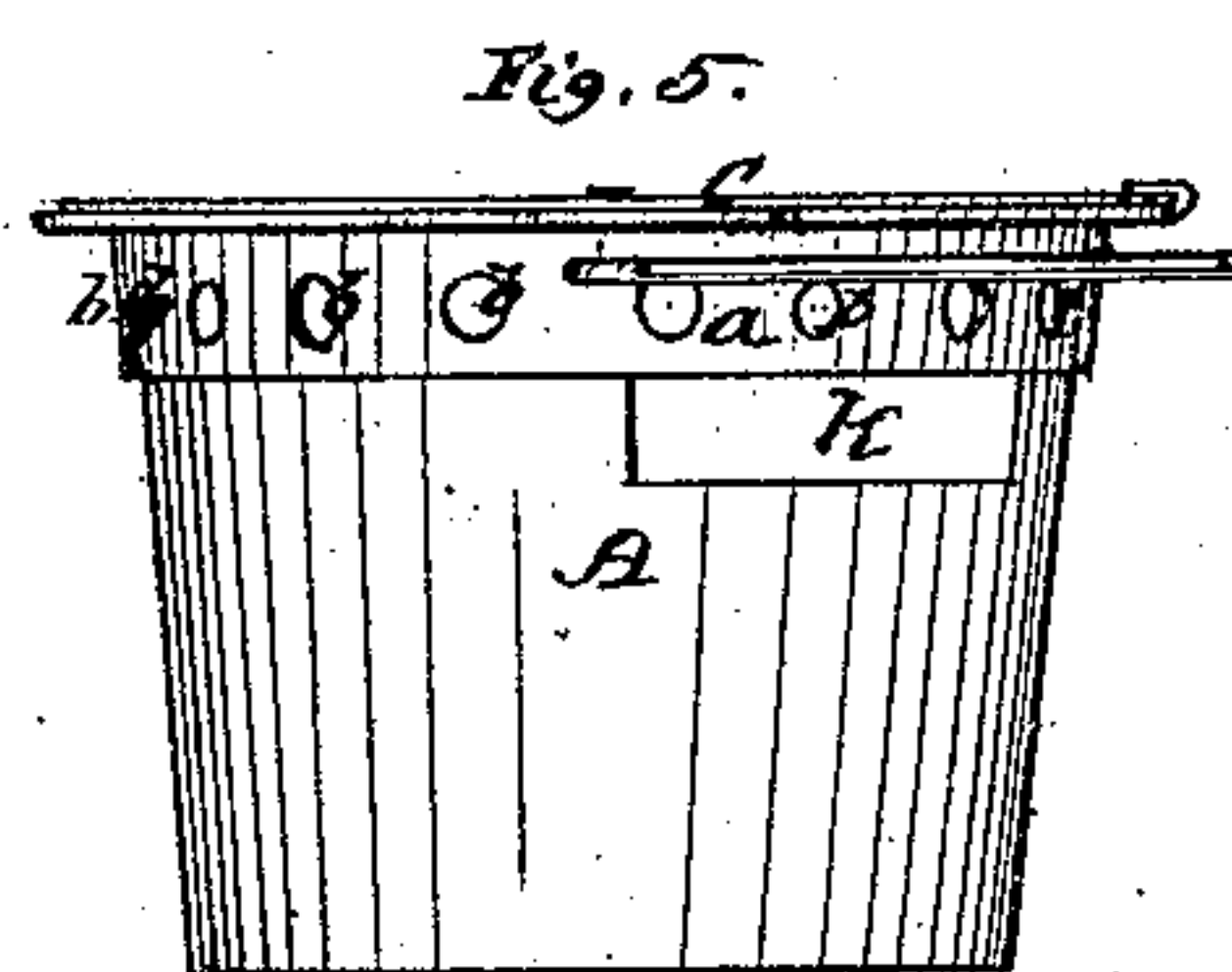
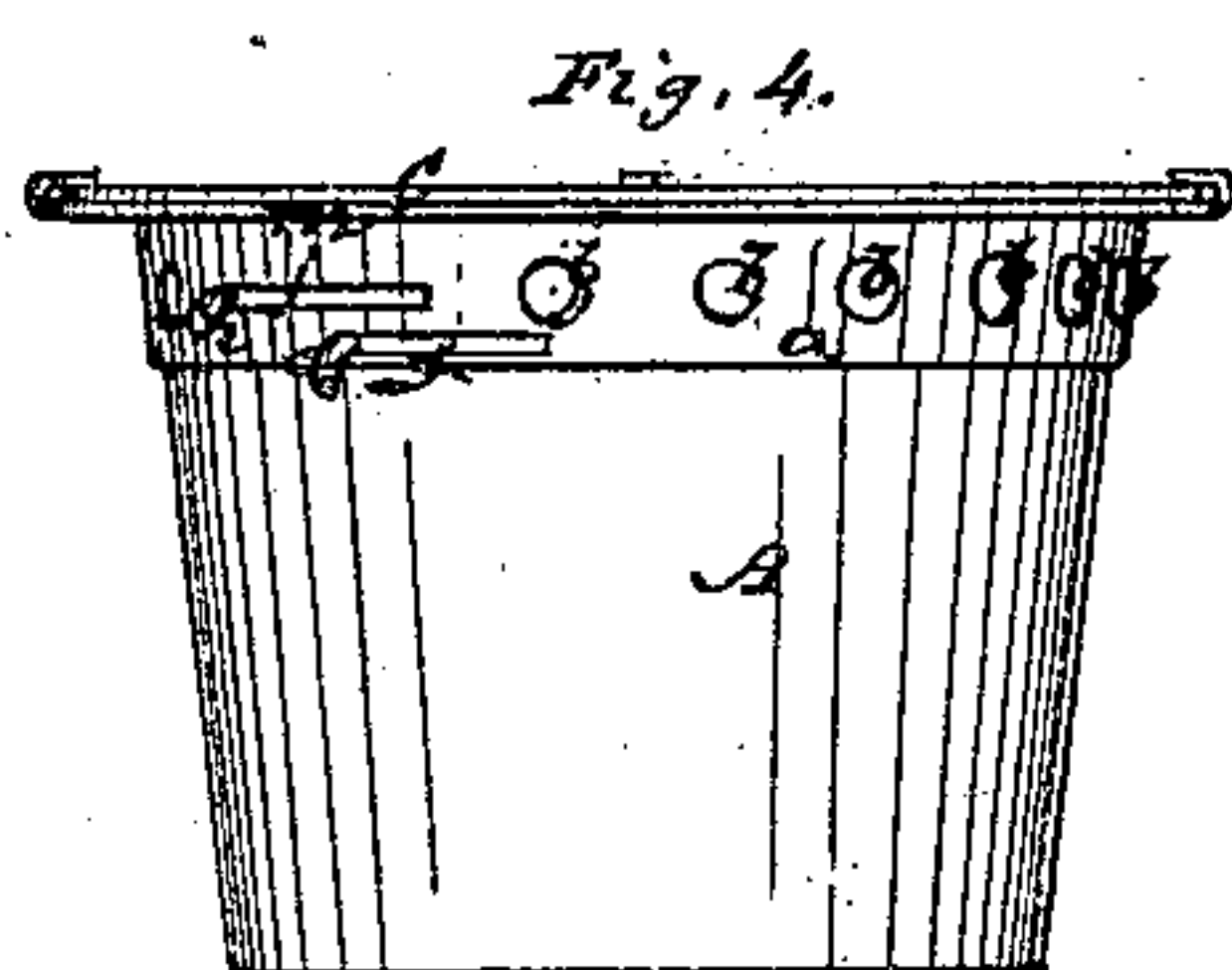
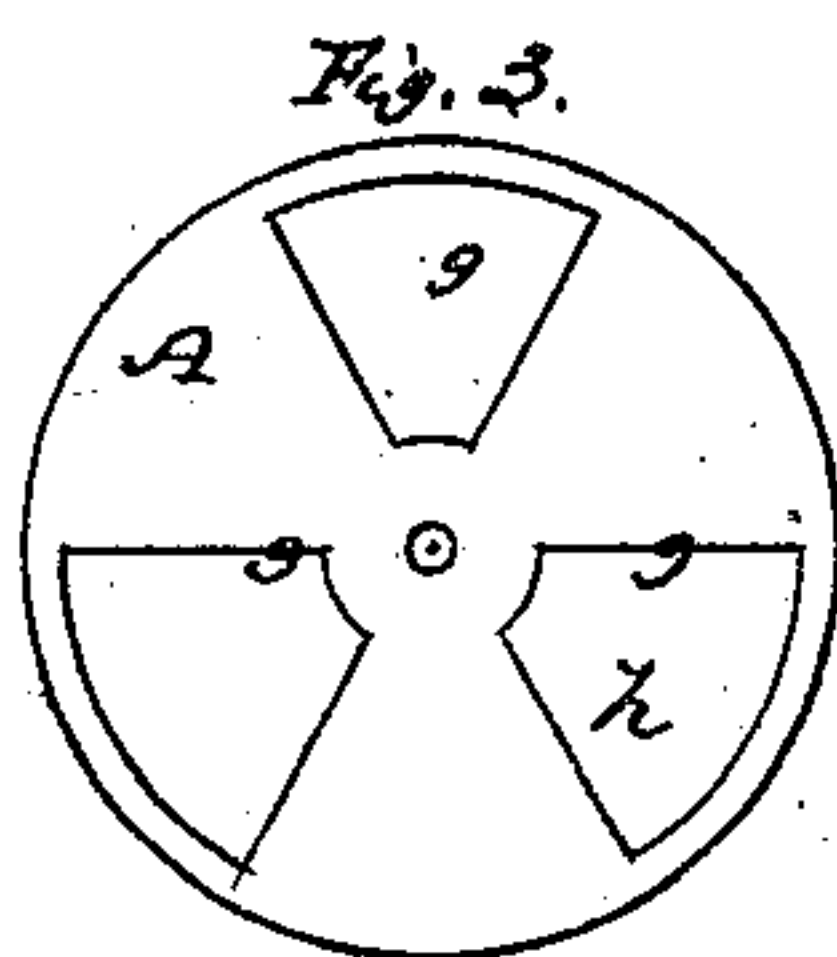
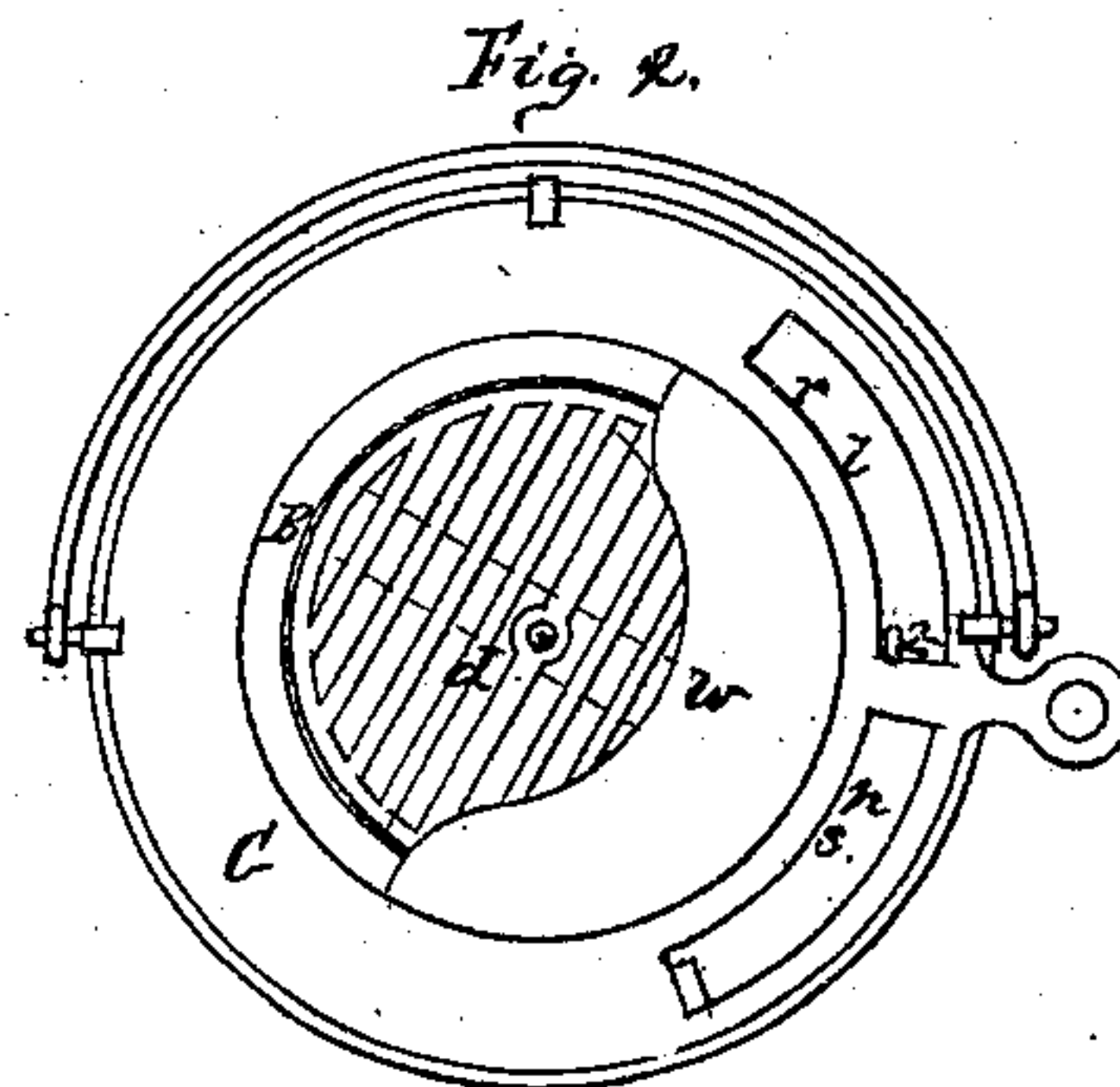
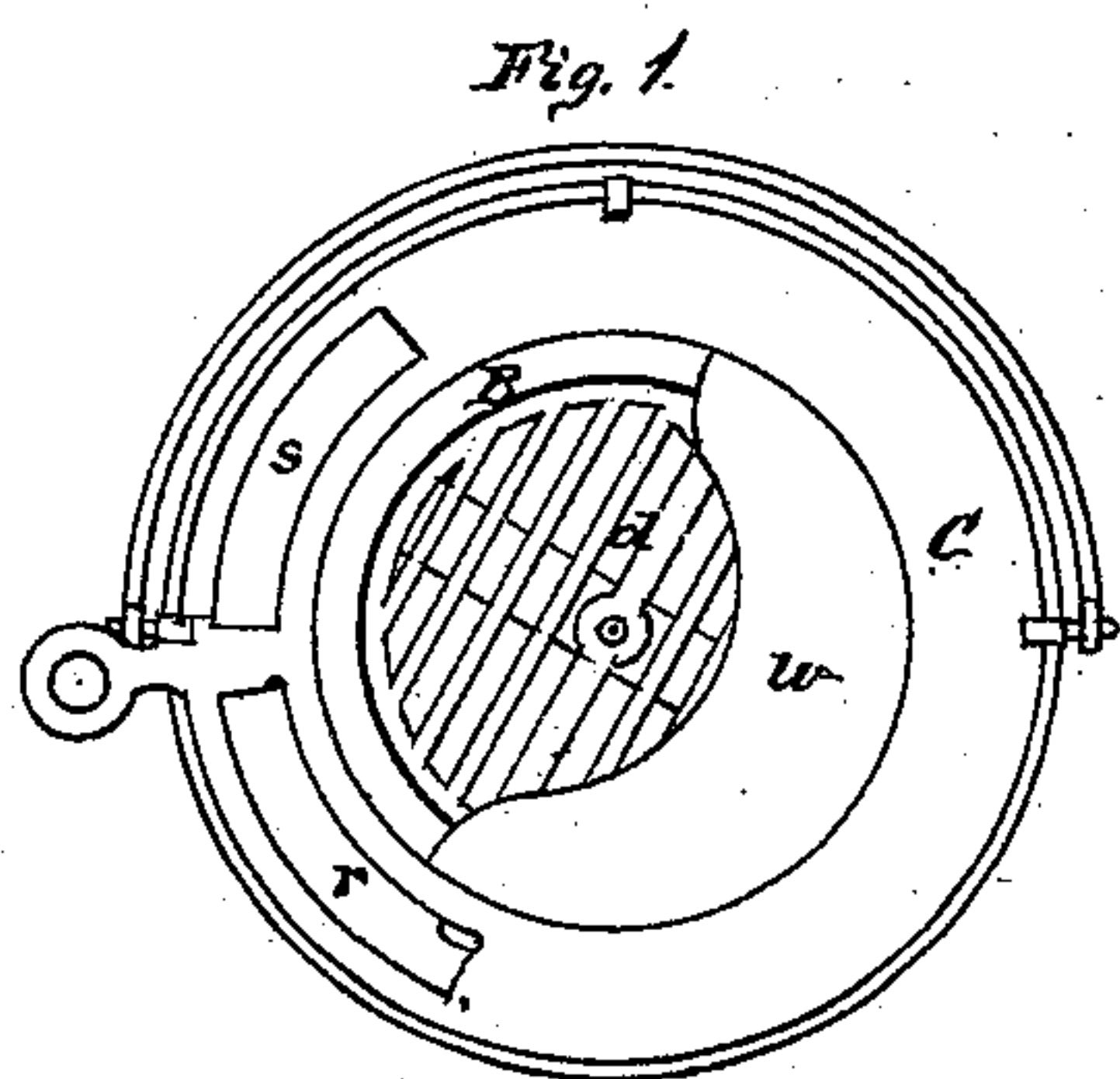


C. VAN DE MARK.

Portable Furnace.

No. 109,780.

Patented Nov. 29, 1870.



Witnesses:-

J. A. Brown,
D. J. Brown

Inventor.

Charles Van De Mark

United States Patent Office.

CHARLES VAN DE MARK, OF PHELPS, NEW YORK.

Letters Patent No. 109,780, dated November 29, 1870.

IMPROVEMENT IN PORTABLE FURNACES.

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, CHARLES VAN DE MARK, of Phelps, in the county of Ontario and State of New York, have invented an Improved Portable Heater; and I hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing making part of this specification.

Figure 1 being a top view of the heater, its parts being in one position.

Figure 2, a top view, with its parts in a different position.

Figure 3, a view of the bottom of the heater.

Figure 4, a view of one side of the heater.

Figure 5, a view of another side thereof.

Figure 6, a central vertical section of the heater, in connection with a boiler or heating-vessel of peculiar construction.

Figure 7, a central vertical section of the same in a different plane from that of the other section.

Figure 8, a horizontal section of the heater, in a plane indicated by the line *x x*, figs. 6, and 7.

Figure 9, a bottom view of the boiler or heating-vessel, used with the heater.

Figures 10 and 11, a top view and vertical section of a modified construction of the heater.

Like letters designate corresponding parts in all of the figures.

This heater or censer is intended to be used in a boiler-hole of a stove for furnishing heat sufficient to boil water, heat smoothing-irons and other articles, or even cook food, by burning charcoal or other suitable fuel in the heater, while the draught is produced by the stove, and the products of combustion are carried away therein.

The leading object of my invention is to improve the heating power of this kind of heater, by directing the heat of combustion upward against the boiler or vessel subjected thereto, while, at the same time, the draught air may be supplied from above the stove, and the products of combustion may pass off below the top stove-plate into the stove.

The heater has an exterior holder, A, of the proper diameter to fit into the required size of boiler-hole, the upper part *a* thereof being enlarged or otherwise arranged, so that it will not enter the stove.

Into this enlarged part holes *b b* admit the draught-air from the outside, above the stove.

Inside of the holder A is fitted an interior vessel or fire-pot, B, of smaller diameter, so as to have an annular space, *c*, all around between it and the outside holder; and it does not reach to the bottom of the holder, so that there is space below it for the passage of the air beneath its sides.

There is at the bottom of the fire-pot B a grate, *d*, provided with a handle, *e*, which extends upward in the annular space *c*, and out through a slot, *f*, in the upper part *a* of the holder, so that the grate may be turned or shaken from the outside, while the heater is in place in the stove.

The draught-air introduced through the holes *b b* into the annular space *c* is admitted to the fuel in the fire-pot on all sides, up through the grate *d*, in the most equable and perfect manner.

There might be openings in the sides of the fire-pot, or a space above the grate *d*, to admit the air to the fuel.

In the bottom of the holder A are apertures *g g g*, opened and closed by a revolving or turning valve, *h*, which has a handle, *i*, extending up through the annular space *c*, and out through a slot, *j*, in the upper part *a* of the holder, whereby the said valve may be controlled from the outside while the heater is in place.

These valve-openings serve two purposes, one to admit draught-air from the interior of the stove below, when desired, as in kindling a fire in the fire-pot; the other to shake the ashes from the fire-pot down through into the stove. Ordinarily it is kept closed.

The air-openings *b b* may be controlled by a valve or damper, if desired.

The draught, after passing upward through the fire-pot, flows out through both the walls of the fire-pot and holder in a flue-space, *k*, just below the top plate of the stove. This flue-space is boxed in, so as to separate it from the annular space *c*; but there is an aperture, *l*, figs. 2 and 7, therefrom upward through the top plate *m*, which covers the said annular space, and adjacent to this aperture *l* is another aperture, *n*; through the said top plate from another flue-space, *o*, communicating with the interior of the fire-pot, but separated from the flue *k* by a partition, *p*, and also separated at the other end by a partition from the annular space *c*.

These two flue-spaces *k* and *o* are controlled by a valve, *q*, which is moved concentrically around the fire-pot B. By moving it one way it will close the communication between the interior of the fire-pot and the flue *k*, and open that to the flue *o*, as shown in fig. 8; or, by moving it the other way, it will open the flue *k*, and close the flue *o*.

This valve is moved by an annular valve-plate, C, on the top of the heater, which plate has apertures *r s*, corresponding, respectively, with the apertures, *l n*, in the plate *m*, when the valve-plate is in the position shown in fig. 2. But, when the valve-plate is turned around into the position shown in fig. 1, both apertures *l* and *n* are closed thereby.

A projection, *t*, extends up from the valve *g* into the space *s* in the valve-plate *C*, and the two valves are so arranged, in relation to each other that, when the valve-plate is turned into the position shown in fig. 1, it will move the valve *g*, so as to close the flue-space *o*, and open the flue *k*; and when the valve-plate is turned into the position shown in fig. 2, it will move the valve *g*, so as to open the flue *o*, and close the flue *k*.

This arrangement of flues and valves is used in connection with the boiler or heating-vessel *D*, which has an inclosed annular space, *u*, around it, but divided by a radial partition, *v*, on one side.

When this boiler or heating-vessel is placed on the heater, so that the partition *v* rests between the apertures *r* and *s* in the valve-plate *C*, its annular space *u* covers said apertures. Now, when it is thus placed, and the valve-plate *C* is turned to the position shown in fig. 2, the flue *o* being open, and the flue *k* closed, the draught will pass from the fire-pot into the said flue *o*, up through the apertures *u* and *s*, into the annular space *u* around the boiler; then through the said annular space, entirely encircling the said boiler, and finally down through the apertures *r* and *l* into the flue *k*, and off into the stove, thereby producing a great heat around the periphery of the boiler, as well as against the bottom thereof.

By turning the valve-plate *C* into the position shown in fig. 1, which can be done while the boiler is on the heater, the draught is excluded from the space *u* around the boiler, and is passed directly out through the flue *k*.

If a peculiarly-constructed boiler or heating-vessel, *D*, is not used, but only a common utensil, the construction of the heater is simplified, as shown in figs. 10 and 11, there being no valve-plate *C*, nor valve *g*, nor apertures in the top plate *m*, nor flue *o*. The draught passes directly away through the flue *k*.

In order to prevent the too direct exit of the heat out through the flue *k*, I locate a horizontal plate, *w*, immediately beneath it in the fire-pot, so as to reach partly across the same, as shown, and thereby direct the heat more forcibly upward against the bottom of the boiler or heating utensil.

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

1. The construction of a portable heater with an inclosing holder, *A*, and interior fire-pot, *B*, having an annular or equivalent space, *c*, between them, and an exit-flue, *k*, near the top thereof, so that, while the draught-air may be admitted from above the stove, it is introduced into the fire-pot at or near the bottom thereof, and the heat of combustion is directed upward through the same against the boiler or other heating-utensil, substantially as and for the purpose herein specified.

2. The combination of the grate *d* with the holder *A* and fire-pot *B*, when provided with a handle, *e*, for shaking it, and arranged to operate substantially as herein set forth.

3. The valve-openings *g g g* in the bottom of the holder *A*, in combination with the inclosed fire-pot *B*, substantially as set forth.

4. The plate *w* in the fire-pot, arranged in combination with the exit-flue *k*, substantially as and for the purpose herein set forth.

5. The construction and arrangement of the flues *k* and *o*, valve *g*, apertures *u*, and valve-plate *C*, with its apertures *r s*, in combination with the boiler or heating-vessel *D*, substantially as and for the purpose herein specified.

CHARLES VAN DE MARK.

Witnesses:

J. S. BROWN,
D. J. BROWN.