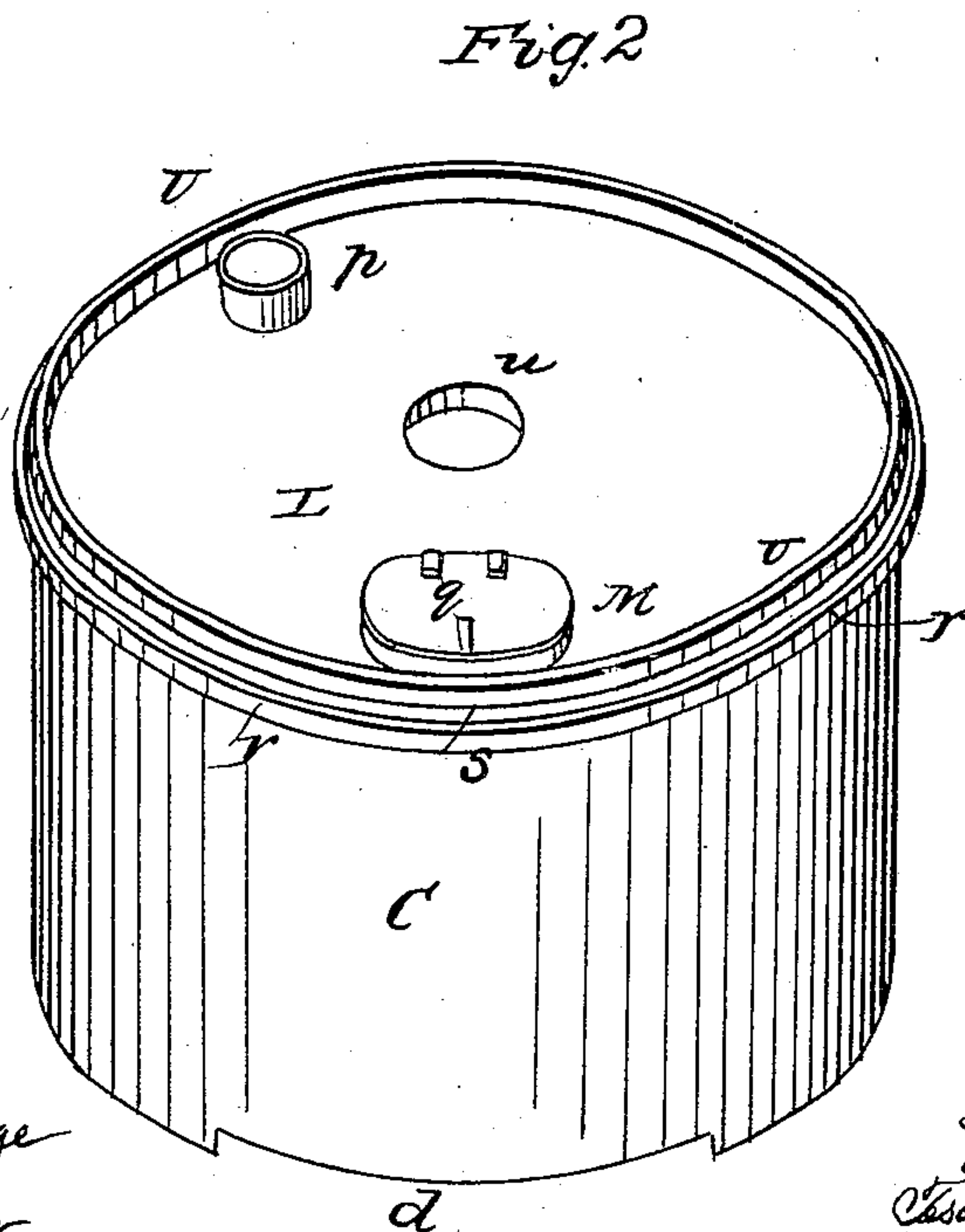
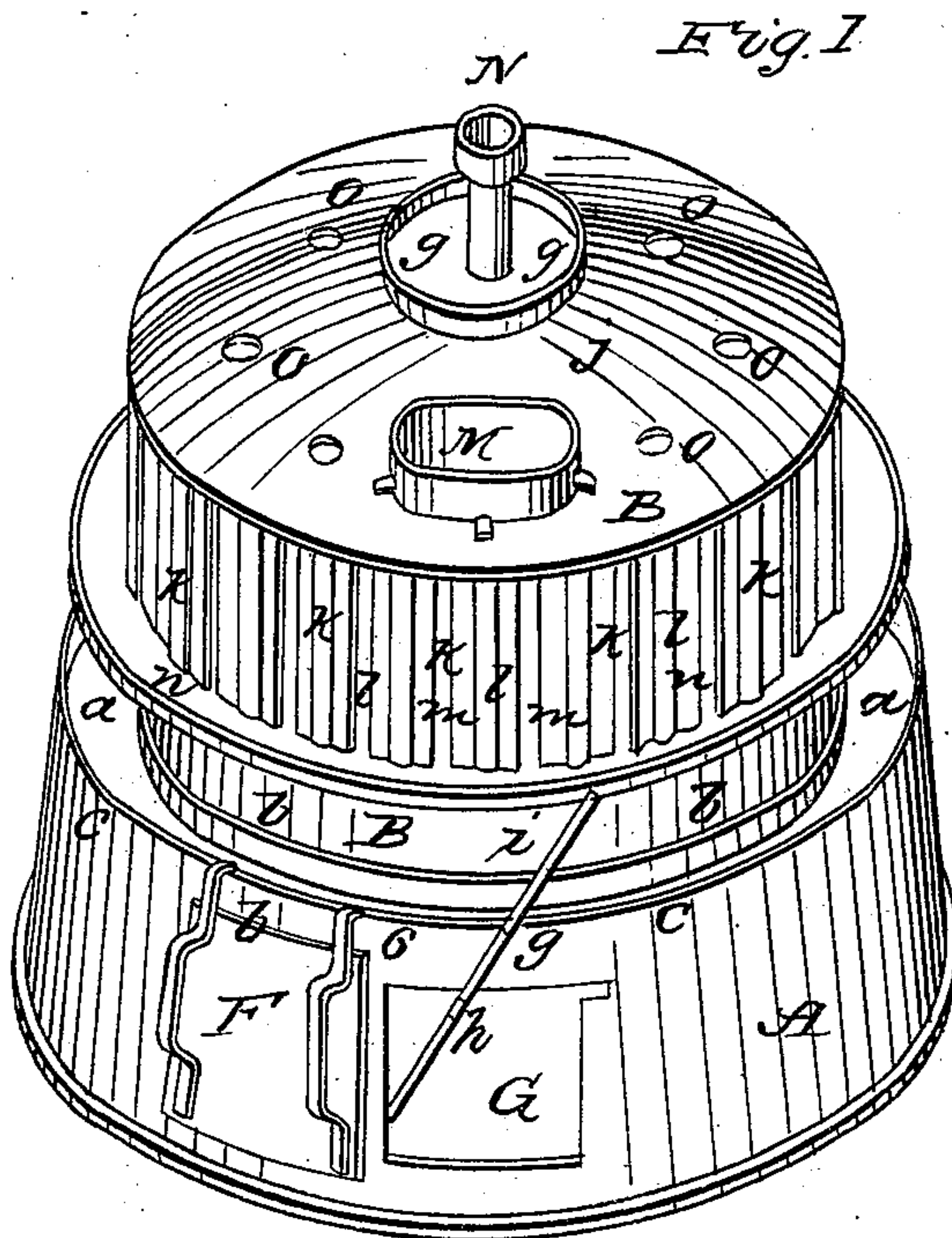


E. WHITELEY.

Steam Apparatus for Green Houses.

No. 93,380.

Patented Aug. 3, 1869.



Witnesses
W. J. Cambridge
L. E. Batcheller

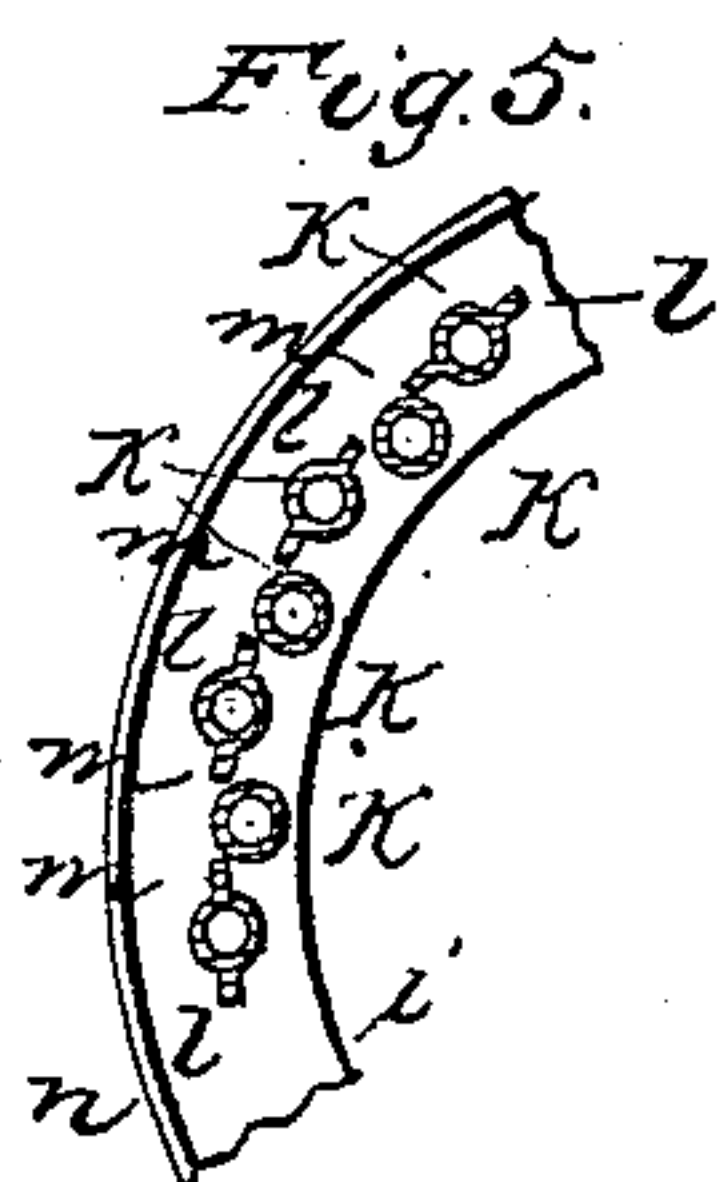
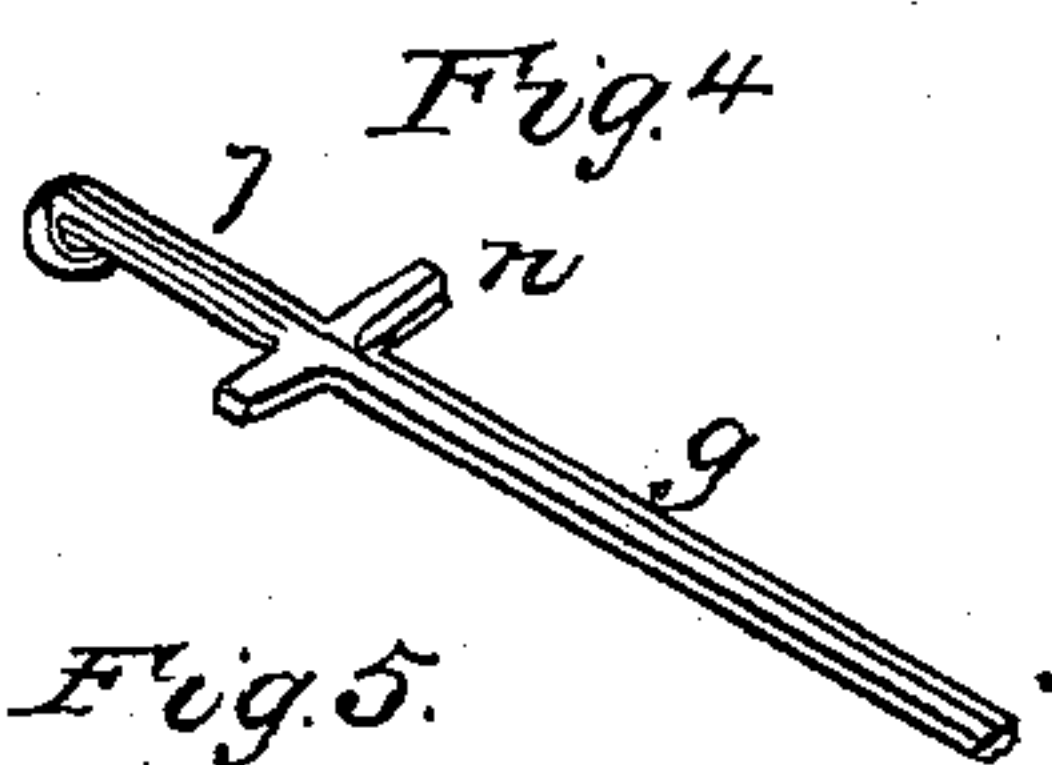
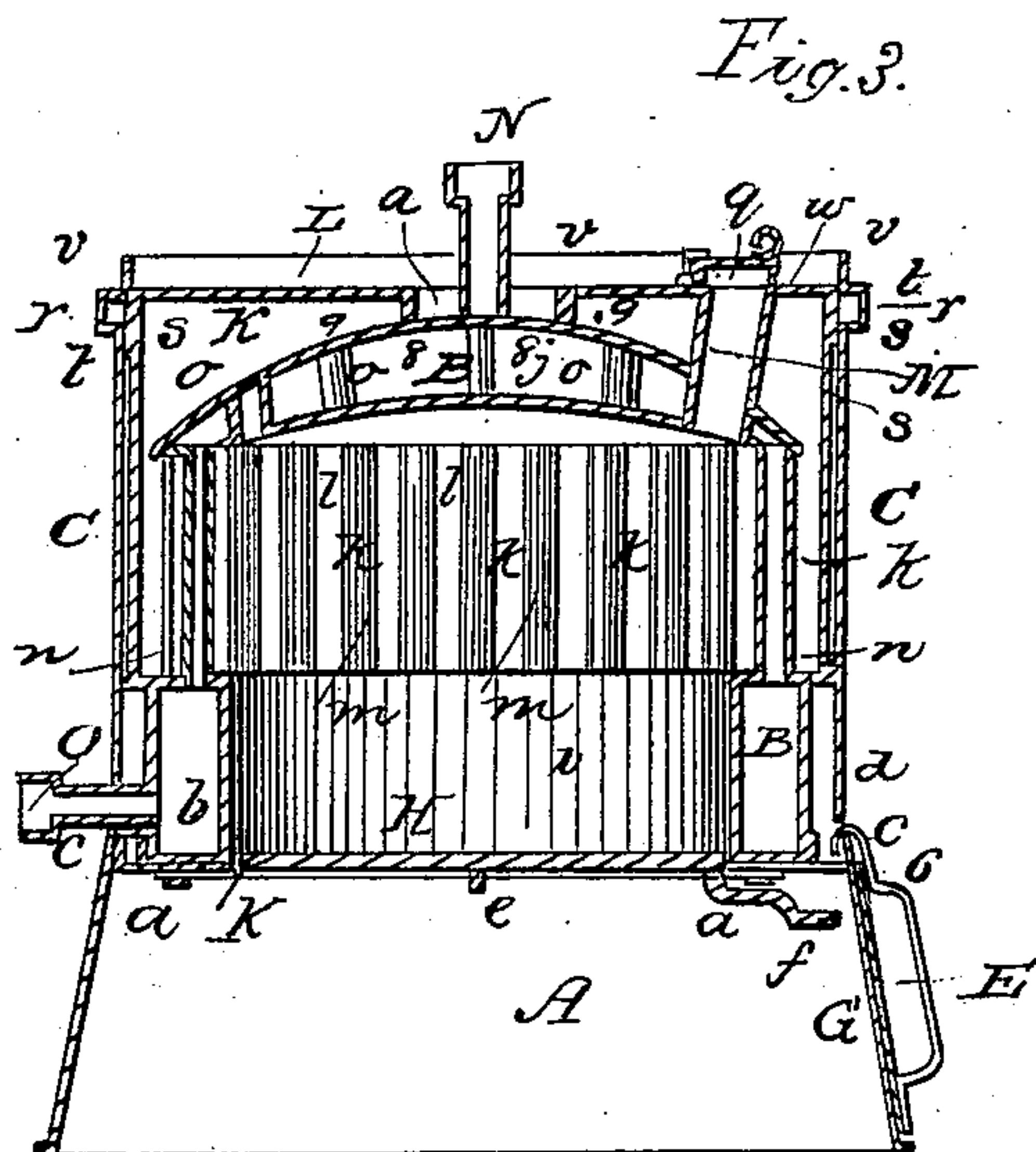
Inventor
Edward Whiteley
By his Attorneys
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EDWARD WHITELEY, OF CAMBRIDGE, MASSACHUSETTS.

Letters Patent No. 93,380, dated August 3, 1869.

IMPROVEMENT IN PORTABLE STEAM-APPARATUS FOR GREENHOUSES.

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, EDWARD WHITELEY, of Cambridge, in the county of Middlesex, and State of Massachusetts, have invented a Portable Apparatus for Heating Greenhouses, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of my portable heating-apparatus, with its casing removed.

Figure 2 is a perspective view of the casing.

Figure 3 is a vertical section through the centre of my portable heating-apparatus in place within its casing.

Figures 4 and 5, details to be referred to.

My invention has for its object to produce a compact, portable, convenient, and economical apparatus for heating greenhouses, &c.; and

My invention consists in a hot-water boiler, composed of a hollow ring or base, and a hollow top or dome, connected by a series of pipes, the boiler being arranged within a casing, and the water circulating through flow and return-pipes, connected with a suitable tank placed in any convenient position above the boiler; and

My invention also consists in a peculiar manner of hanging the ash-pit door, so that it may be opened and closed by sliding it back and forth in a convenient and expeditious manner; and

My invention furthermore consists in certain details to be particularly described hereafter.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings—

A is the base, of circular form, upon the horizontal flange *a*, near the top of which, rests the hot-water boiler B, the bottom of which fits snugly within a vertical flange, *b*, which thus insures a tight joint between the two surfaces.

The outer edge *c*, of the top of the base, extends up above the horizontal flange *a* to about the level of the top of the vertical flange *b*, and the bottom of an outer casing, C, rests upon the horizontal flange *a* snugly up against the inner surface of this edge *c*, also forming a tight joint.

A portion of the casing C, near its bottom, is cut away, as shown at *d*, figs. 2 and 3, to admit of hanging, upon the top of the base A, the hooks G of an ash-pit door, E, which covers over the opening G to the ash-pit; and by thus hanging the door, it may be readily slid back and forth to open or close the opening G, this construction being exceedingly cheap and convenient.

Extending diametrically across the opening enclosed by the flange *a*, is a horizontal bar, *e*, to the centre of which is pivoted a circular grate, H, from the front of

which projects an arm, *f*, provided with a socket for the reception of a shaking-bar, *g*, one end, 7, of which is bent round and provided with a cross-piece, *h*, fig. 4, by which construction, when it is desired to incline the grate down-only sufficiently to allow of the escape of the clinkers without dumping the grate, the end of the cross-piece is inserted, and the long arm of the shaking-bar is turned to one side, until the lower end 7 strikes against the side of the opening G, which thus serves as a stop to prevent the further turning of the grate. (See fig. 1.)

The hot-water boiler B consists of a hollow ring or base, *i*, and a hollow top or dome, *j*, connected together by a series of pipes, *k*, arranged in two concentric rows, fig. 5, the ring *i* and the pipes *k* enclosing the space which forms the fire-pot or receptacle for containing the fuel.

The pipes *k* of the outer row are provided with wings or flanges, *l*, on opposite sides, which may be made in one and the same piece therewith, these flanges presenting an extended heating-surface, spaces *m* being left between them for the escape of the smoke and gases which pass up between the boiler B and an inner smoke-casing, I, into a chamber, K, the bottom of the casing I resting upon a flange, *n*, projecting out from the upper portion of the ring *i*, the outer edge of the flange being turned up so as to form a tight joint.

o are flues or pipes, which pass through the hollow dome *j*, and also serve to conduct the smoke and gases from the fire-pot up into the chamber K, from which they pass through an opening, *p*, (in a plate, L, forming the top of the chamber,) to the smoke-flue.

At the top of the outer casing C is a ring, *r*, provided with a groove, *s*, for the reception of a flange, *t*, extending down from the outer edge of the plate L, the groove *s* being filled with sand, to insure a tight joint.

M is a hopper, the lower end of which fits into an opening in the dome *j*, the upper end being opened or closed by a lid or cover, *q*, hinged to the plate L, the hopper serving to conduct the fuel into the fire-pot beneath.

u is a circular opening at the centre of the plate L, to allow of the passage of a vertical "flow-pipe," N, proceeding from the interior of the dome *j*, and communicating through a series of heating-pipes arranged around the interior of the greenhouse or apartment with a tank, (not shown;) and from the interior of the ring *i* proceeds a horizontal "return"-pipe, O, also communicating with the tank, by which arrangement the water is caused to circulate through the pipes, tank, and boiler, thus heating the apartment as desired.

v is a flange projecting up from the outer edge of the plate L, the opening *u*, through which the vertical pipe N, passes, being also surrounded by a flange, 8,

projecting down and fitting within another flange, 9, rising from the top of the dome. The opening in the plate L, which communicates with the hopper M, is also provided with a flange, *w*, around which fits a corresponding flange on the lower side of the cover *q*, and the top of this plate L is covered with a layer of sand, which prevents the radiation of heat, and seals the joints between the flanges 8 9 and *w q*, so as to prevent the escape of smoke or gas from the chamber K.

By the employment of sand-joints, as above described, I am enabled to dispense with the use of bolts, thus facilitating the removal of the parts, and allowing of their expansion and contraction.

This construction allows of the plate L and casings C I being readily removed to obtain access to the pipes *k o* of the boiler, which may thus be rapidly cleaned, which is particularly desirable where wood or bituminous coal is used, which operation is attended with

considerable difficulty in heating-apparatus as heretofore constructed.

Claims.

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

The boiler B, consisting of the hollow dome *j*, with its flues *o* and the hollow ring or base *i*, connected by a series of pipes, *k*, and surrounded with a casing, in combination with the "flow" and "return"-pipes N O, constructed and operating substantially as described.

Also, the removable top plate L, with its flanges *t v*, in combination with the casing C, provided with a groove, *s*, substantially as set forth.

Also, the smoke-casing I, supported upon a flange, *n*, in combination with the boiler B and the top plate L, substantially as set forth.

Witnesses:

E. WHITELEY.

N. W. STEARNS,
A. H. EVANS.