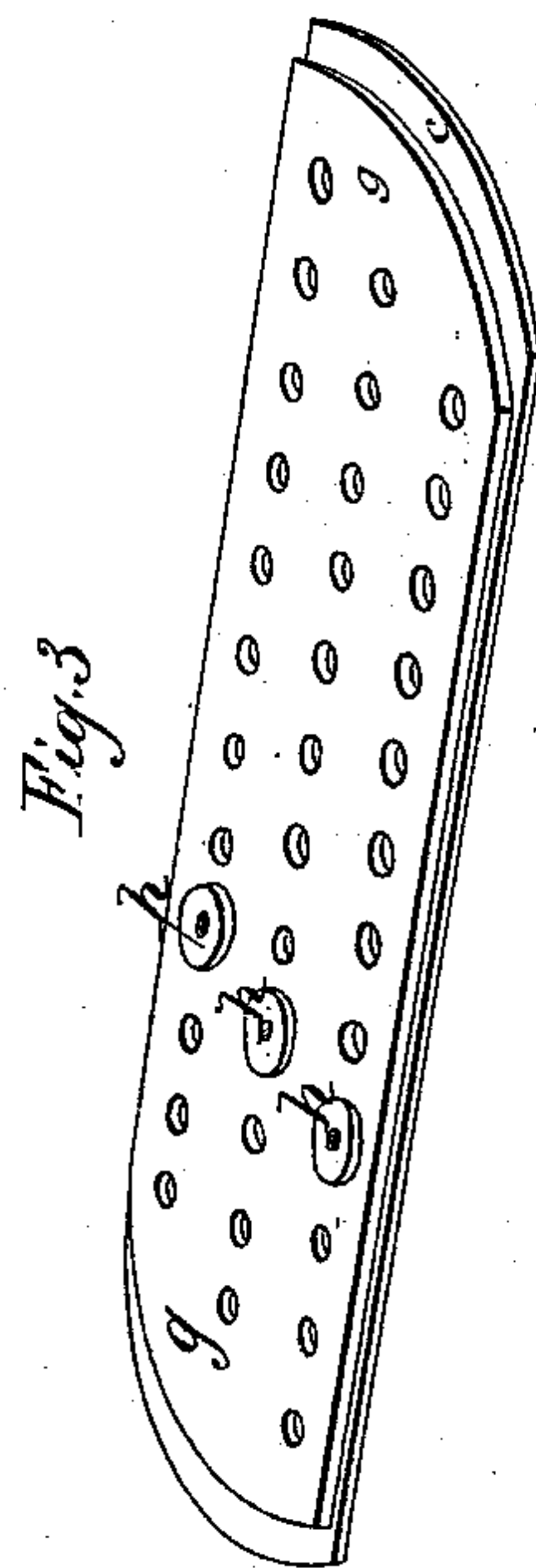
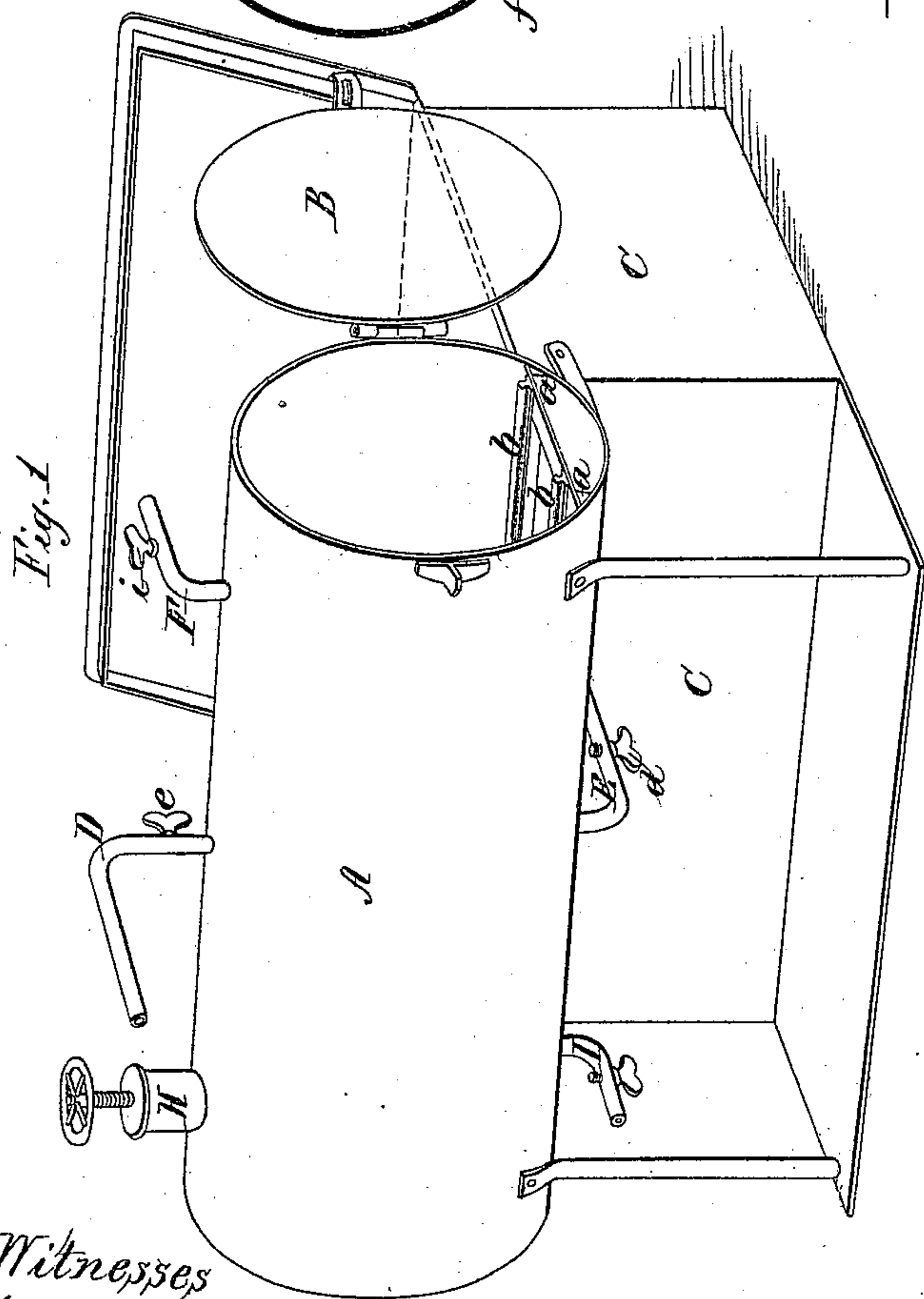
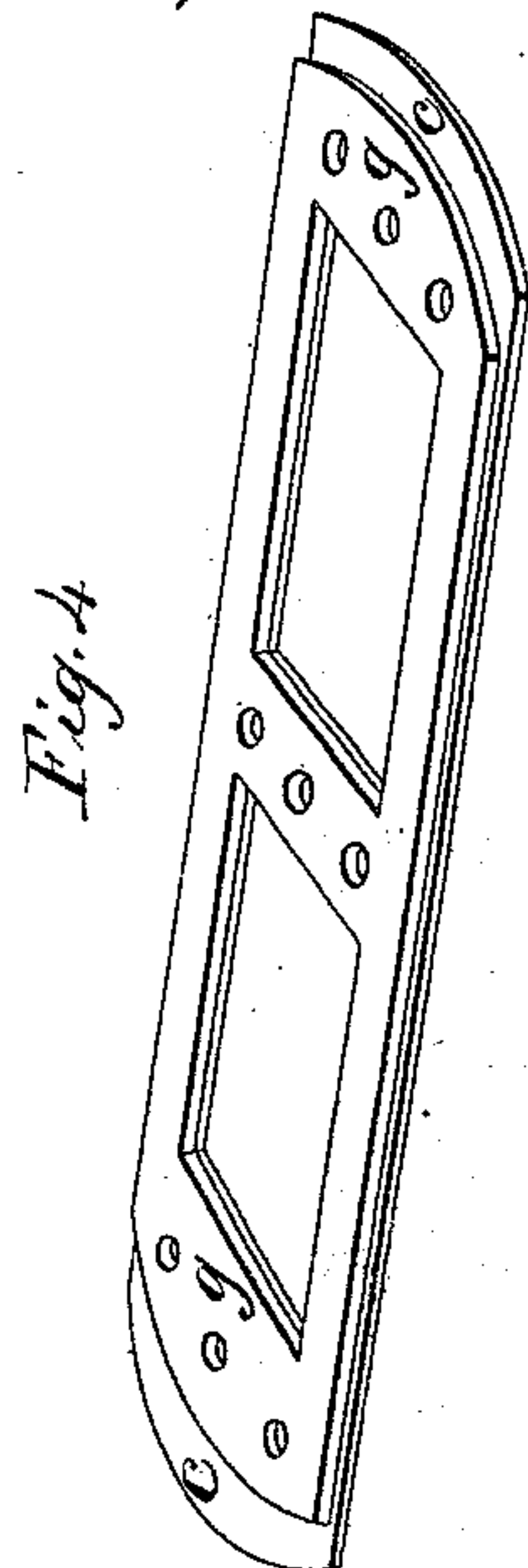
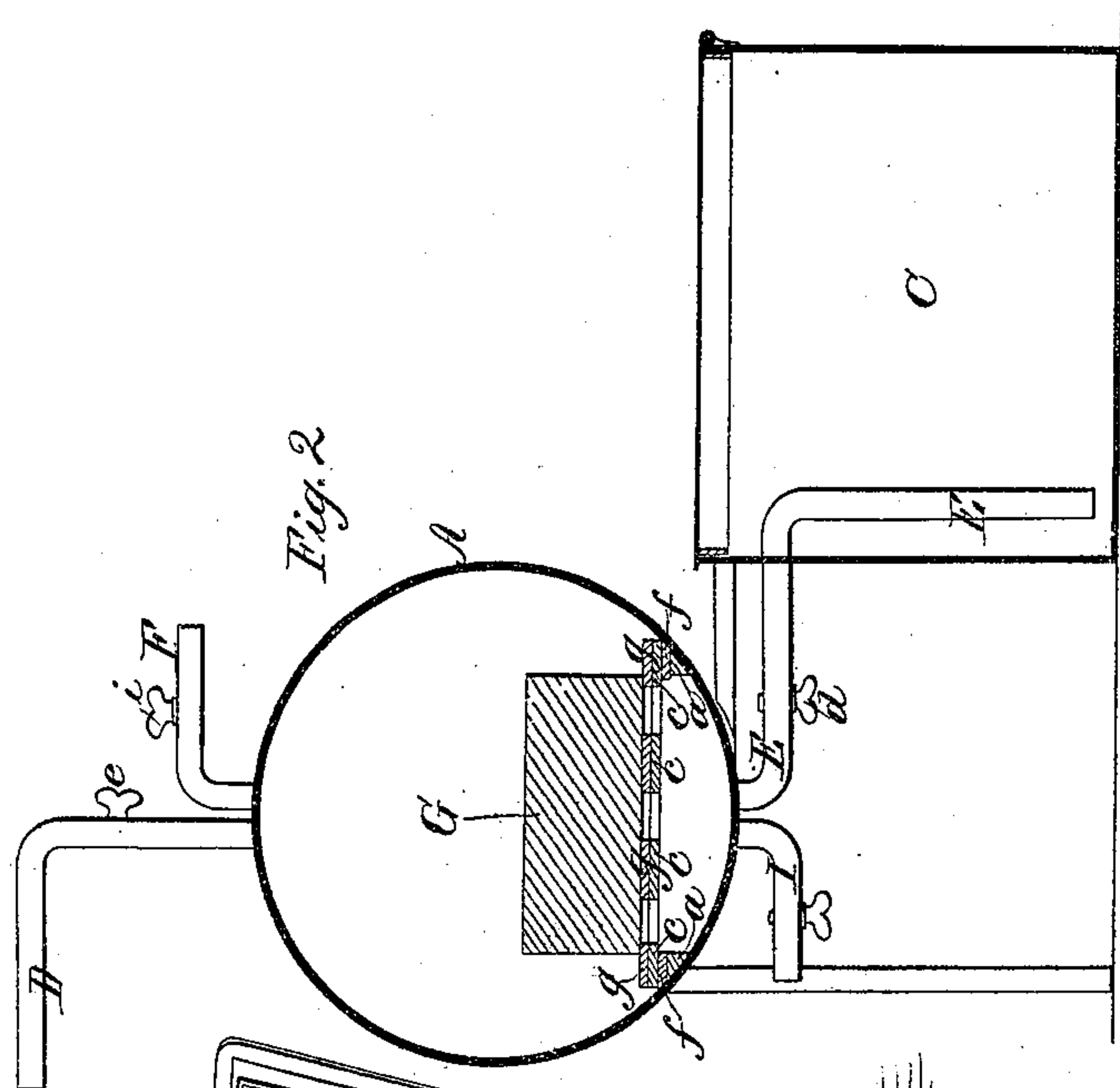


*R. Norris, Jr.*

*Artificial Stone.*

*N<sup>o</sup> 92,345.*

*Patented Jul. 6, 1869.*



Witnesses  
*Jas. D. Patten*  
Edmund Masson

Inventor  
*Richard Norris, Jr.*  
By Atty *A. B. Stoughton*

# UNITED STATES PATENT OFFICE.

RICHARD NORRIS, JR., OF BALTIMORE, MARYLAND.

## IMPROVED MODE OF HARDENING AND WORKING "RANSOME CONCRETE STONE."

*Specification forming part of Letters Patent No. 92,345, dated July 6, 1869.*

*To all whom it may concern:*

Be it known that I, RICHARD NORRIS, Jr., of Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful improvements in the manner of hardening and washing what is commonly known as the "Ransome Concrete Stone;" and I do 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 represents a perspective view of an apparatus which has been successfully used in applying these forced hardening and washing processes to the artificial stone. Fig. 2 represents a vertical cross-section through the same. Figs. 3 and 4 represent perforated diaphragms, which, in connection with rubber cloth or other equivalent packing material, and with the stone or stones to be hardened and washed, or either, separate the two chambers within the outer shell or jacket, so that the liquid used for hardening or washing must, perforce, pass through the stone or stones in passing from one chamber to the other under pressure.

Similar letters of reference, where they occur in the separate figures, denote like parts of the apparatus or appliances in all of the figures.

My invention consists in inclosing artificial stones, or the incipient stones, in a close chamber, which, by suitable packing and diaphragms, may be separated into two chambers in its interior, and so that the stone or stones to be treated, when placed on said diaphragm and packing, shall be the only avenue or communication through which the chloride of calcium for hardening, or water for washing out the chloride of sodium formed therein, can pass under pressure from one chamber to the other.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A is a cylinder, of any suitable form, having a door, B, at one of its ends, for convenience, through which the material to be treated in it

may be introduced. Within this close cylinder or chamber, and upon a ledge, *a*, secured thereto, is placed a track, *b*, or a perforated diaphragm, *c*, as the case may be, and as will be hereinafter explained.

U is a tank or reservoir for containing the chloride of calcium used in the process, this tank, for convenience, being sunk in the ground, so that the cylinder may be emptied into it, through a connecting or draining pipe, the cylinder and the tank, with their appliances for controlling them, constituting the main elements of the apparatus.

When the exhausting process is used in this apparatus, I proceed to fill the chamber with the molded sand and silicate composition, and for convenience do so by running a small car loaded with the blocks or pieces to be so treated into the cylinder upon the track *b*. The door B is then closed and sealed, luted or packed. Then, by an air-pump connected with the pipe D, the air is exhausted from the cylinder and from the composition, and the pipe closed by the cock *e*. The cock *d* in the pipe E is then opened, and the chloride rushes up into the cylinder, where it surrounds the incipient stone or stones, and thoroughly penetrating the composition and converting the silicate into an insoluble silicate of lime, and thus hardening the material. When the process has been completed, then the cock *e* in the pipe D is opened, and the chloride of calcium runs back into the reservoir. Water for washing out the chloride of sodium formed in the stone may be introduced substantially in the same way.

In the pressure processes a different disposition of the material to be treated is made in the cylinder, and better shown in Fig. 2. The track *b* is withdrawn, and a perforated diaphragm, *c*, is laid upon the ledge *a*, this diaphragm having a rubber packing, *f*, underneath and around its edges, and over it is placed a perforated rubber diaphragm, *g*, the holes of which match the holes in the metal diaphragm *c*. Upon the rubber *g* is laid the material to be treated, and so that it shall cover some of the holes through the diaphragms, and the remaining holes, if any, not covered by the material to be treated are



plugged with rubber plugs *h*. The door is then closed and made tight, as before explained. The chloride of calcium or the water, whichever may be used at the time being, is introduced into the upper part of the cylinder through the pipe *F*, until the stone *G* is surrounded by it. The cock *i* in the pipe *F* is closed, and by means of a hydraulic press, *H*, operated in any of the usual well-known ways. The calcium or water above and around the stone is forced or pressed through the stone, permeating every minute space in it, and thus effectually accomplishing the hardening or washing process, whichever it may be. If the former, when the chloride of calcium is driven through and into the lower or under chamber, it may be drawn off through the pipe *E* into the reservoir again; and if it be the washing process, then the water driven through the stone into the lower chamber is drawn off

through the pipe *I*. Both processes may be accomplished in the same apparatus, and the forcing of the liquid, whether the chloride of calcium or water, is thus quickly and effectually done.

Having thus fully described my invention, what I claim is—

Forcing chloride of calcium to harden or water to wash out the chloride of sodium in the manufacture of the "Ransome concrete stone," so known, into and through the material, by artificial means and force, applied in a close chamber, substantially in the manner herein described and represented.

R. NORRIS, JR.

Witnesses:

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