

(No Model.)

F. J. FERRELL.
APPARATUS FOR MELTING SNOW.

No. 428,670.

Patented May 27, 1890.

Fig. 1

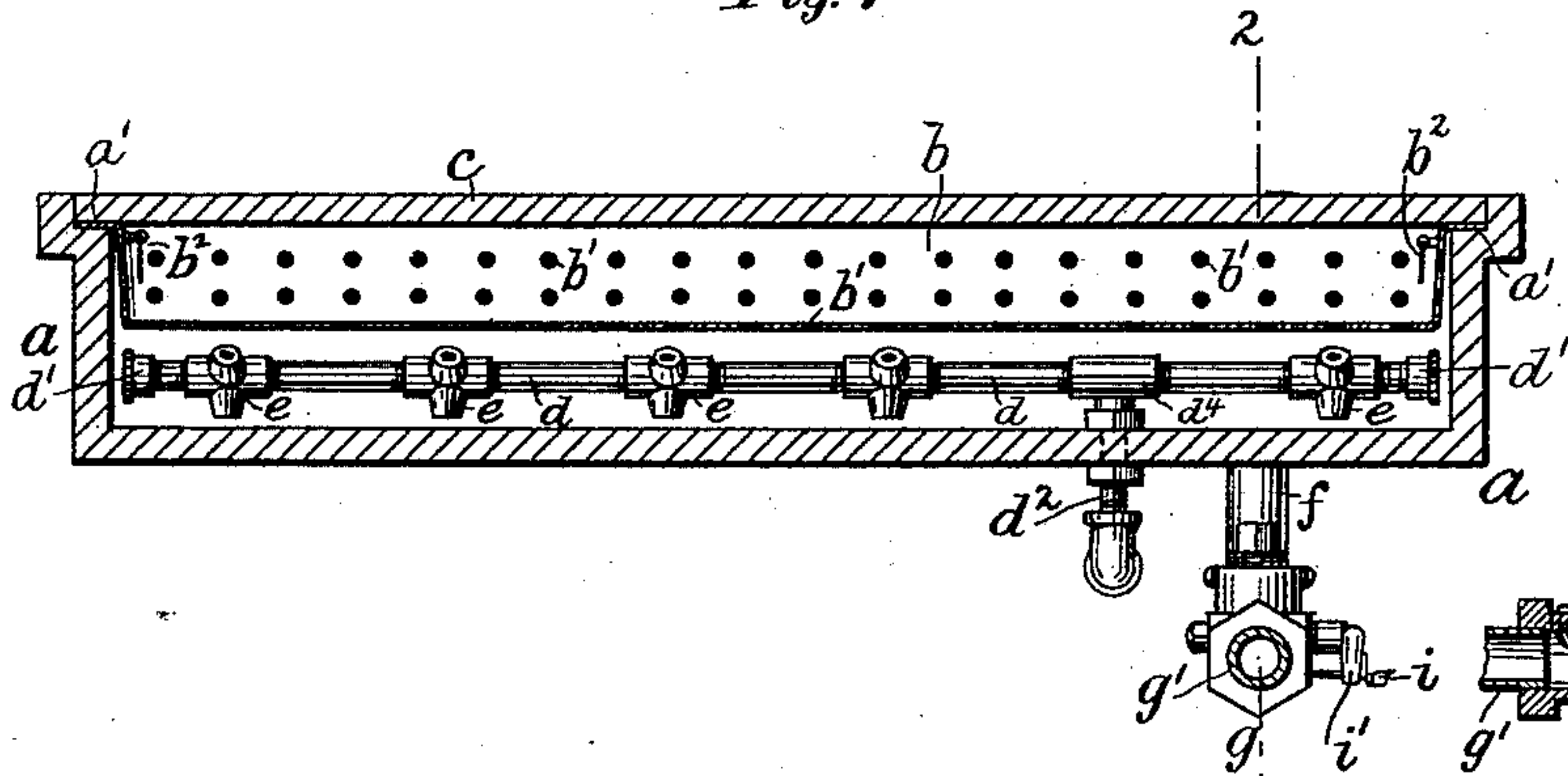


Fig. 2

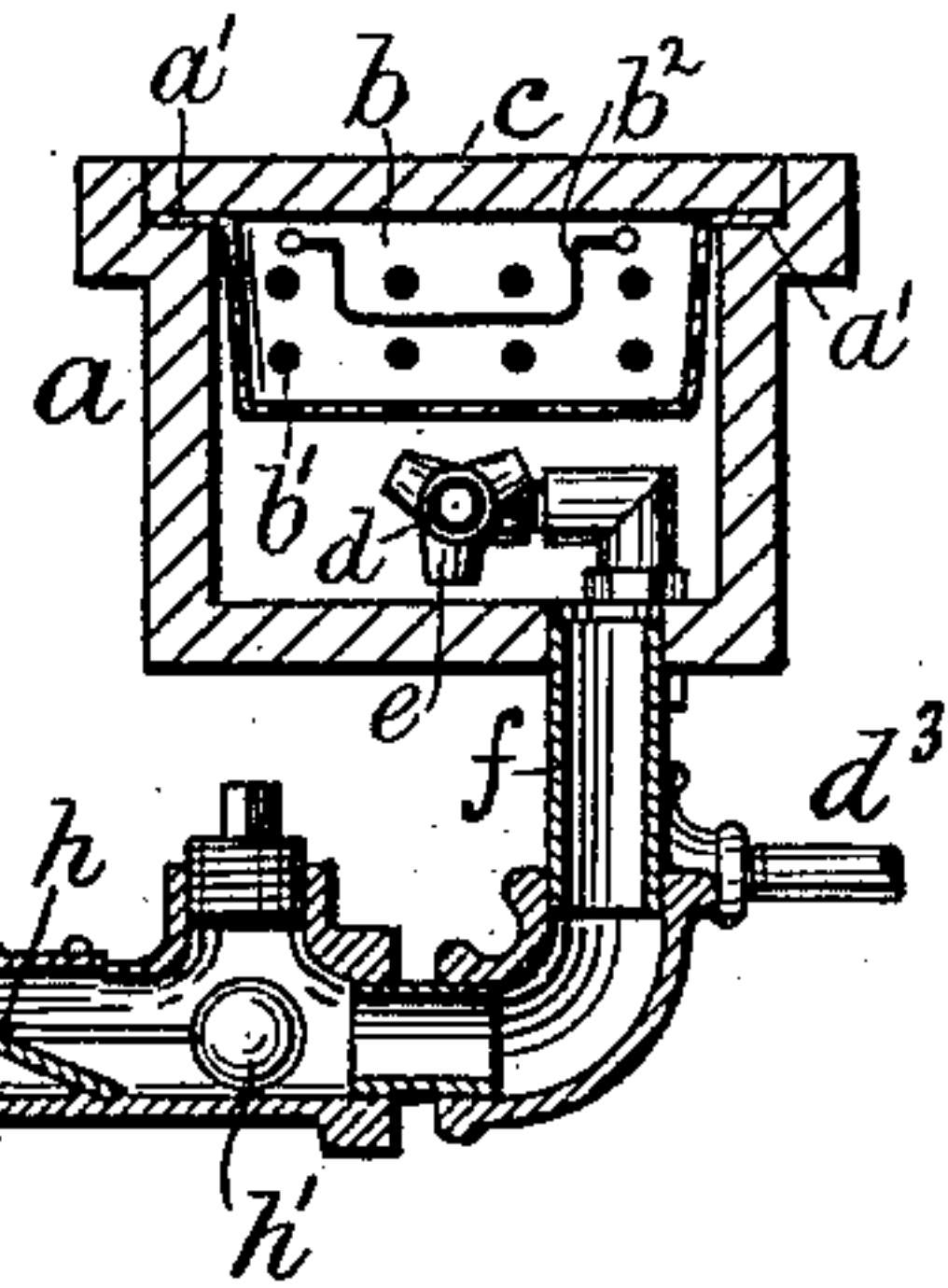


Fig. 3

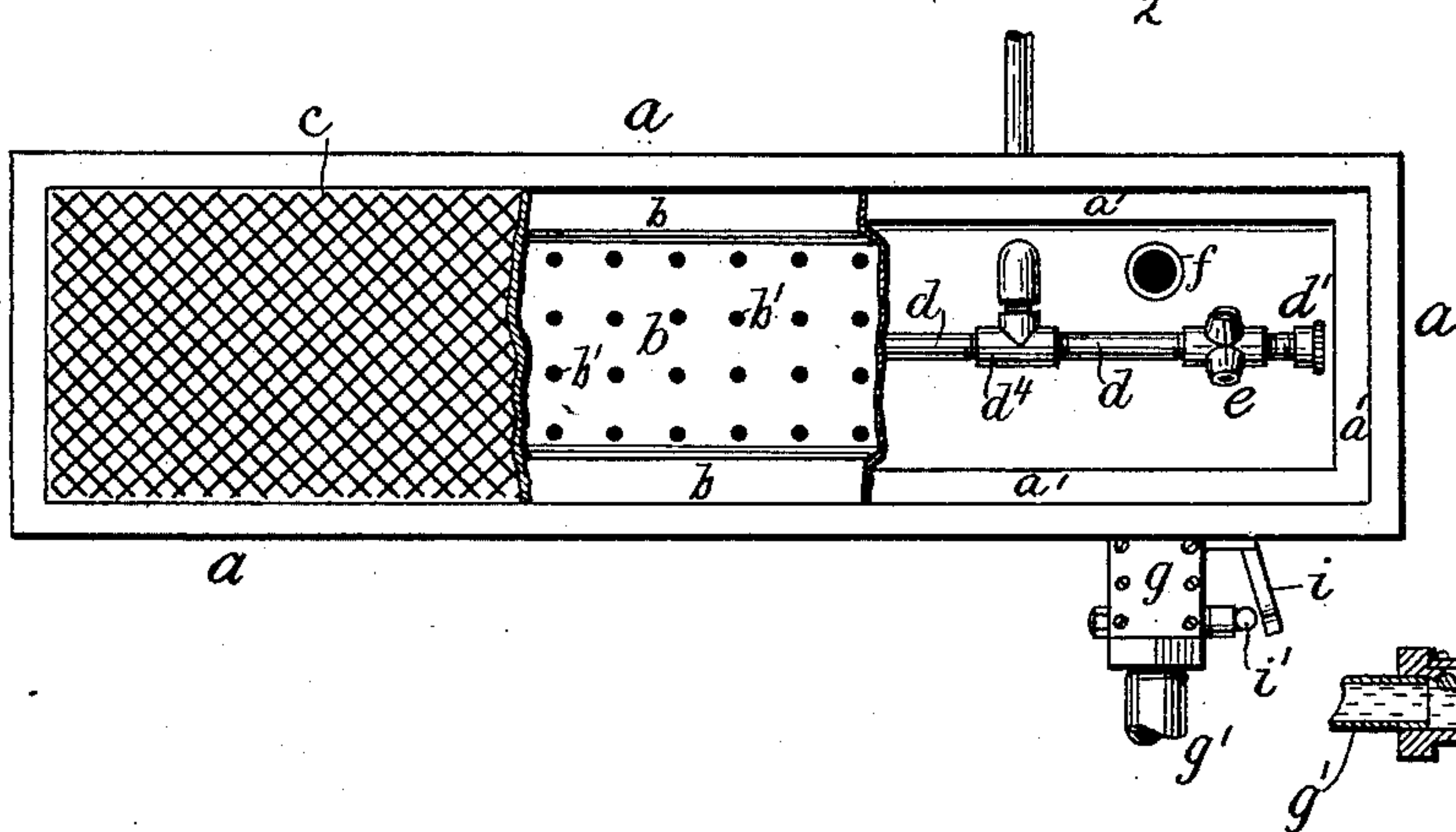


Fig. 4

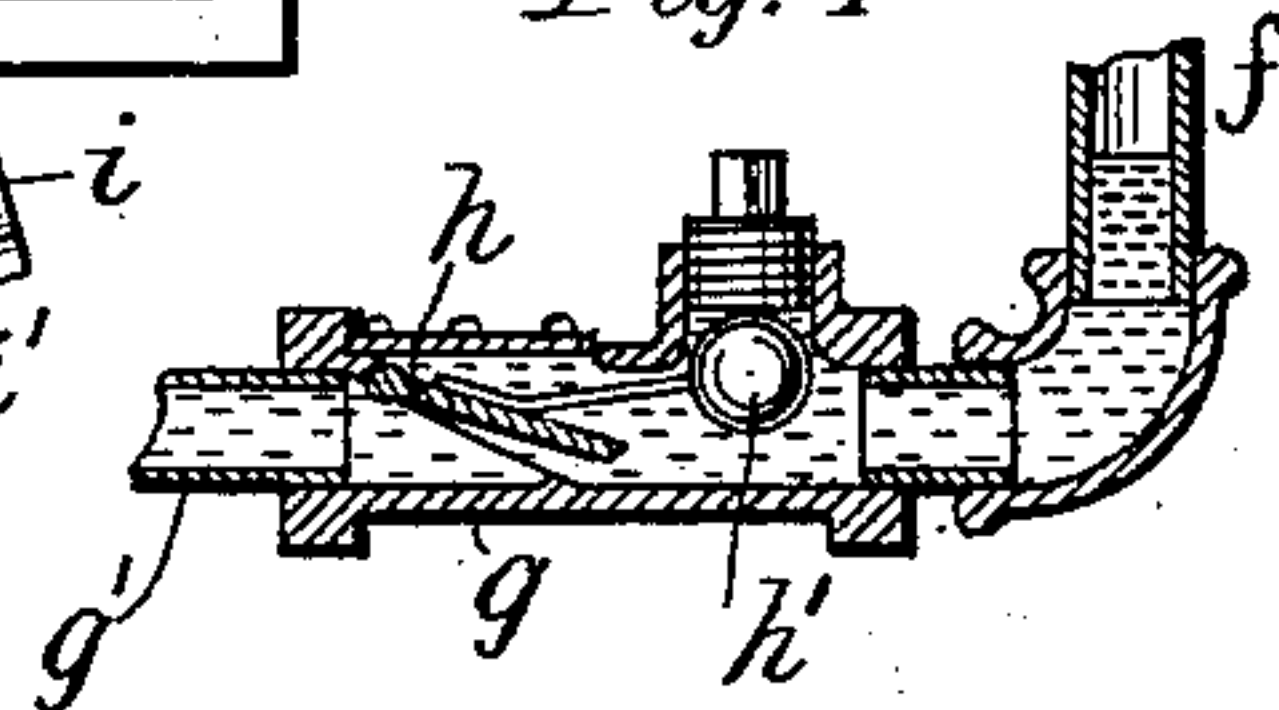
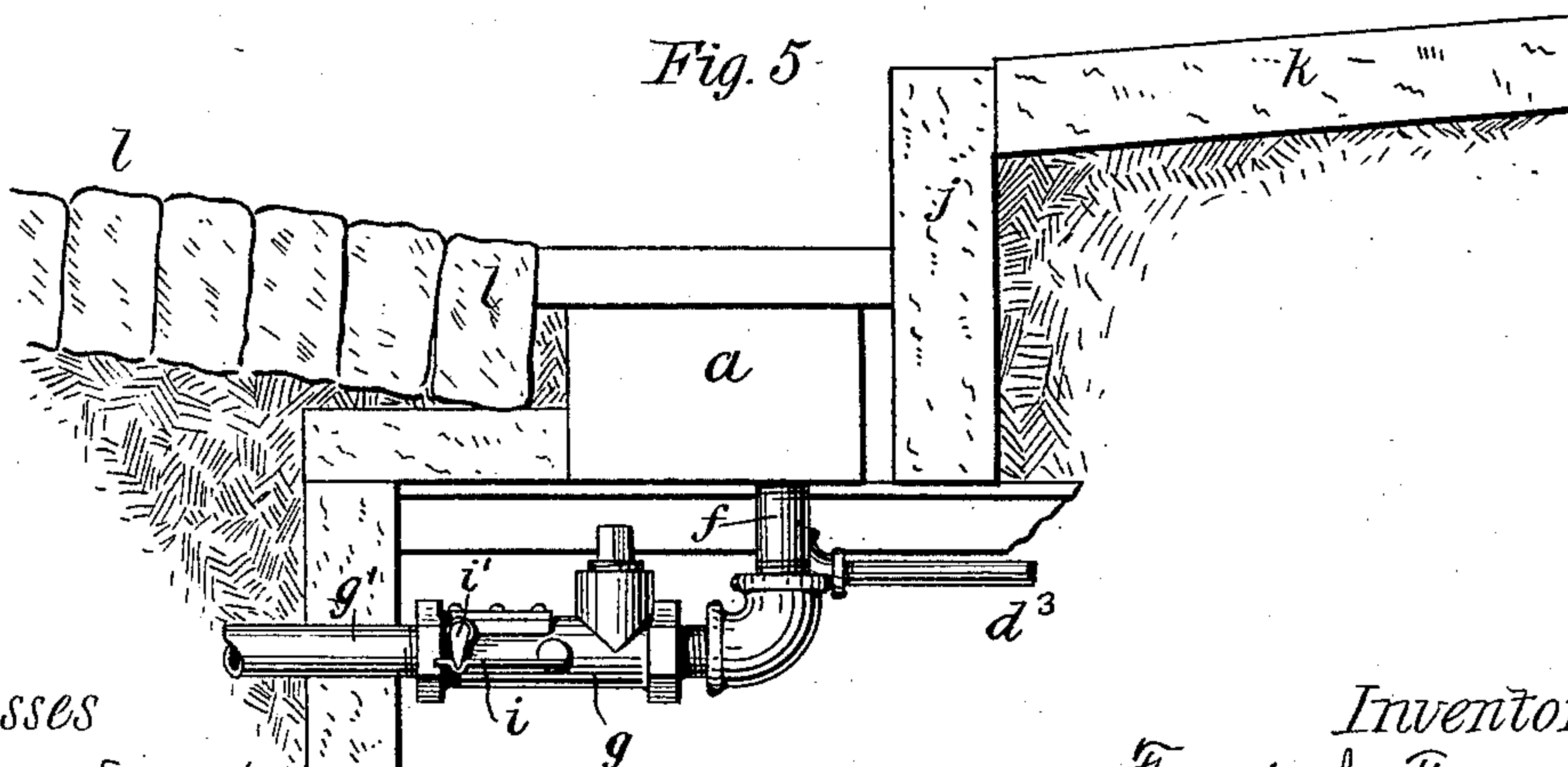


Fig. 5



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APPARATUS FOR MELTING SNOW.

SPECIFICATION forming part of Letters Patent No. 428,670, dated May 27, 1890.

Application filed October 7, 1889. Serial No. 326,232. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. FERRELL, a citizen of the United States, residing at New York, county and State of New York, have
5 invented certain new and useful Improvements in Apparatus for Melting Snow and Ice, of which the following is a specification.

This invention has for its object to provide
10 a simple and efficient means for melting snow and ice; and it consists of a box.

In the preferred form of my invention the box is provided with a duct for heated fluid and openings leading from the duct to the interior of the box, and with a removable
15 cover adapted to form the bed or bottom of a gutter, and with a perforated tray, and with an opening for the escape of the water as the snow or ice is melted, and the escape opening or outlet has an automatic steam-
20 trap connected thereto, whereby when steam is used as the melting fluid it is not allowed to escape until condensed to water. The melter is adapted to be placed so that the upper surface of its cover forms a portion of
25 the bed of a street-gutter, and the entrance-duct is preferably connected with the steam-supply of the adjacent house, and the exit-opening with the street sewer or sewer-pipes of the house.

30 The automatic steam-trap is of improved construction; and my invention embodies improvements in the construction of various other parts of the apparatus, all of which will be now described in connection with the
35 accompanying drawings, forming part of this specification.

In the drawings, Figure 1 is a central vertical longitudinal section of my improved snow and ice melter. Fig. 2 is a transverse vertical
40 cal section on the line 2 2, Fig. 1; and Fig. 3 is a plan view with portions of the cover and tray broken away. Fig. 4 is a detached central section of the trap. Fig. 5 is a vertical section showing my improved melter ar-
45 ranged so that its upper surface forms the bed or bottom of a street-gutter.

The box *a* is preferably made of cast metal. It is closed at the sides and bottom and open
50 at the top, and the sides are shaped near their upper edges to form a ledge *a'*, running entirely around the box. The perforated tray *b* is provided with flanges which rest upon

the ledge *a'*, and it fits within the box, leaving some space between the sides of the tray and of the box and considerable space between
55 the bottom of the tray and the bottom of the box. It is provided along its bottom and sides with perforations *b'*, which permit free passage of the water produced by melting the snow and ice, but which are small enough to
60 retain within the tray stones or other materials large enough to choke the exit-passages. Handles *b²* are pivoted at the ends of the tray to facilitate lifting it out of the box.

The cover *c* of the box rests upon the
65 flanges of the tray *b* and fits within the sides, with its upper surface flush with the upper edges of the sides of the box. This upper surface of the cover *c* is preferably roughened
70 by grooves, raised lines, or otherwise when it is to form the bed or bottom of a gutter, so as to increase its coefficient of friction.

The duct for the heated fluid, which, as shown in the drawings, is a pipe *d*, is placed longitudi-
75 nally of the box in the space between the bottom of the box and the bottom of the tray *b*, and is made up of several sections screwed together. It is provided with openings lead-
80 ing into the interior of the box by means of the improved five-way fittings *e*, which join the sections of the pipe together. These five-way fittings *e* are each provided with three
85 nozzles, two of which are pointed upward toward the perforated tray, and one of which is pointed downward and acts as a drip-open-
90 ing. The remaining two openings are interiorly threaded and embrace the ends of the sections of the pipe *d* adjacent to the connection *e*. The ends of the pipe *d* are closed
95 by screw-caps *d'*, and a T-coupling *d⁴* is located at some convenient place in the pipe, (near the right-hand end in the drawings,) and joined to
100 an elbow or L-coupling, to which is connected a pipe *d²*, passing through the bottom of the box and rigidly secured to the box by nuts, whereby the pipe *d* is held in place. The pipe
105 *d* is connected in a suitable manner with a supply of heated fluid, preferably steam, as by the piping *d³*, joined to the steam-heating
110 pipe of the adjacent house when the melter is used in a street-gutter, as shown in Fig. 5. Such pipe *d³* would in practice generally be provided with a suitable valve conveniently
115 located in the pipe to admit and cut off steam

for the melter, or other means might be used for this purpose; but such device is not shown in the drawings, as it forms no part of my invention.

5 The outlet or escape, as shown in the drawings, comprises the pipe *f*, screwed into a hole in the bottom of the box. The lower end of the pipe *f* is joined by an L-coupling and short section of pipe to an automatic steam-
10 trap of improved construction. This automatic steam-trap comprises the casing *g*, provided with a valve *h*, which, when closed, checks the flow of water therethrough. The valve *h* is held normally closed, as shown in
15 Fig. 2, by means of the float-ball *h'*, and thus prevents the escape of live steam; but when sufficient water has collected in the passage above the valve to lift the float-ball *h'* the valve *h* is opened, as shown in Fig. 4, and re-
20 mains open as long as there is water enough above the valve to support the float-ball.

When the apparatus is not being used to melt snow or ice, and therefore no live steam is being supplied thereto, the valve can be
25 held open by the spring *i*, which catches over and holds the end of the arm *i'*, which arm is secured to the valve-stem, as shown in Fig. 5. When the melter is in use, the spring *i* is
30 swung clear of the arm *i'*, as shown in Figs. 1 and 3, and the valve and float thus permitted to freely operate.

In Fig. 5 the trap is shown placed in a vault immediately under the gutter, so that access may be readily had thereto to operate
35 the spring *i*; but various other arrangements may be made, as the trap may be located at any suitable place in the outlet-pipe.

The outlet or escape, when the device is used in a street-gutter, is connected by the
40 pipe *g'* to the sewer, either directly or through the sewer-pipes of the adjacent house. This pipe *g'* and the pipe *f* together form the outlet-pipe.

In Fig. 5, *j* represents the curbstone, *k* the sidewalk-pavement, and *l* the street-pave-
45 ment, and, as before described, the pipes *d*³ and *g'* are respectively the inlet for the steam or other heated fluid and the outlet for the water of condensation and melting. A single
50 melting apparatus of about the proportions shown in the drawings is sufficient for a considerable length of gutter.

When the apparatus is to be used, the cover
55 *c* is removed and the steam-supply turned on. The snow and ice are thrown upon the tray *b* and are there directly acted upon by the steam which escapes through the nozzles of the five-way couplings *e e* and passes through the perforations of the tray. The
60 water produced by the melting and the water of condensation pass downward through the openings in the tray to the bottom of the box and escape through the outlet *f*. The perforations in the tray retain all materials—
65 such as sticks and stones—which are large enough to clog the outlet, and when these accumulate to any extent in the tray it can be

lifted out of the box by the handles *b*² and such materials dumped out of it. The automatic steam-trap prevents the escape and
70 waste of live steam, which is thus compelled to act upon the snow and ice in the tray.

The melter acts as an ordinary gutter-bed when not in use, and the interior of the melter is closed and protected by the cover. 75

The apparatus can be readily and quickly put in operative condition, and when in operation the direct action of the steam causes a ready and quick melting of the snow and
80 ice placed in the tray.

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

1. An apparatus for melting snow and ice, consisting of a box provided with a duct for
85 heated fluid, and openings leading from the duct to the interior of the box, and a perforated tray in the box, an outlet-opening, and a removable cover adapted to form the bed or bottom of a gutter, substantially as set
90 forth.

2. An apparatus for melting snow and ice, consisting of a box provided with a duct for
95 heated fluid and openings leading from the duct to the interior of the box, a perforated tray in the box, and an outlet-duct provided with an automatic steam-trap, substantially as set forth.

3. An apparatus for melting snow and ice, consisting of a box provided with a duct for
100 heated fluid and openings leading from the duct to the interior of the box, a perforated tray in the box, an outlet-duct provided with an automatic steam-trap, and a removable cover adapted to form the bed or bottom of
105 a gutter, substantially as set forth.

4. In an apparatus for melting snow and ice, in combination, a box and a pipe therein adapted to be connected to a source of heated
110 fluid and made up of sections joined together by a coupling having nozzles or openings for the egress of the heated fluid, substantially as set forth.

5. In an apparatus for melting snow and ice, in combination, a box, a removable cover
115 therefor adapted to form the bed or bottom of a gutter, and a pipe therein adapted to be connected to a source of heated fluid and made up of sections joined together by a coupling having nozzles or openings for the
120 egress of the heated fluid, substantially as set forth.

6. In an apparatus for melting snow and ice, in combination, a box, a removable cover
125 therefor adapted to form the bed or bottom of a gutter, a removable perforated tray in the box having flanges resting on a ledge of the box, a pipe in the box adapted to be connected to a source of heated fluid and made up of sections joined together by a coupling
130 having nozzles or openings for the egress of the heated fluid, and an outlet-pipe leading out from the bottom of the box, substantially as set forth.

7. In an apparatus for melting snow and ice, in combination, a box, a removable cover therefor adapted to form the bed or bottom of a gutter, a removable perforated tray in the box having flanges resting on a ledge of the box, a pipe in the box adapted to be connected to a source of heated fluid and made up of sections joined together by a coupling having nozzles or openings for the egress of the heated fluid, an outlet-pipe leading out from the bottom of the box, a valve in the outlet-pipe, and a float connected to the valve adapted to hold the valve normally closed and to open the valve when the fluid in the pipe lifts the float, substantially as set forth.

8. In an apparatus for melting snow and ice, in combination, a box, a removable cover therefor adapted to form the bed or bottom

of a gutter, a removable perforated tray in the box having flanges resting on a ledge of the box, a pipe in the box adapted to be connected to a source of heated fluid and made up of sections joined together by a coupling having nozzles or openings for the egress of the heated fluid, an outlet-pipe leading out from the bottom of the box, a valve in the outlet-pipe, and a float connected to the valve adapted to hold the valve normally closed and to open the valve when the fluid in the pipe lifts the float, substantially as set forth.

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