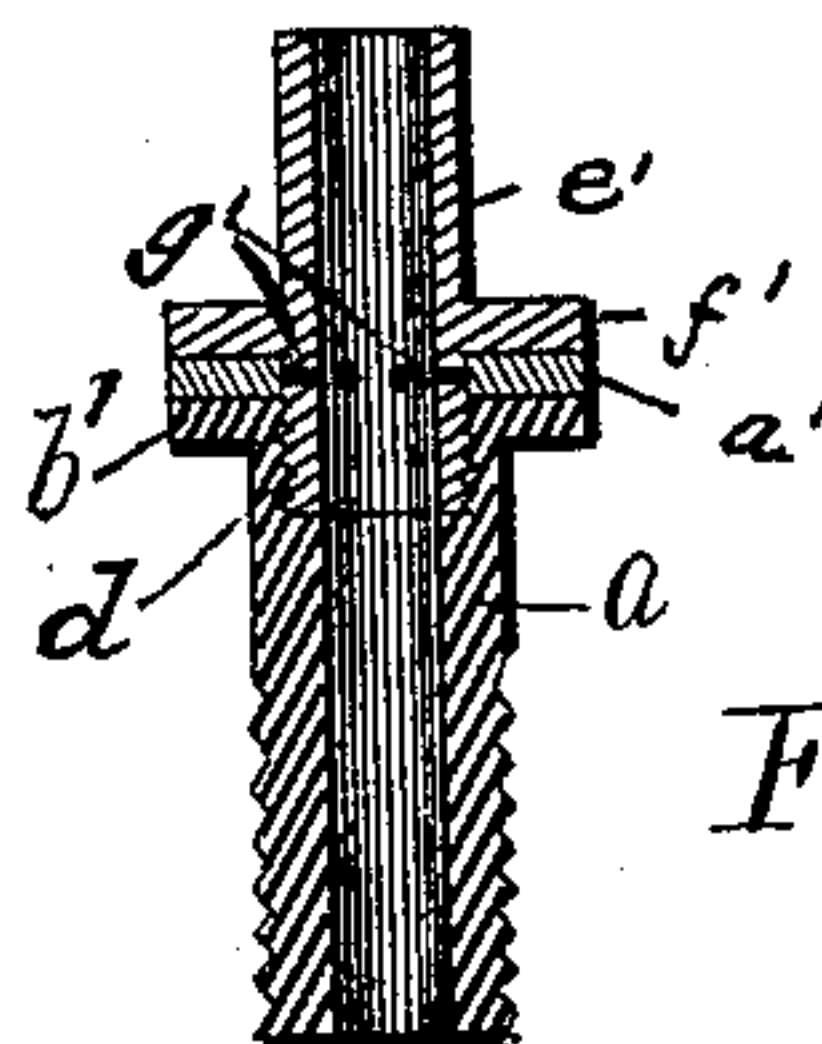
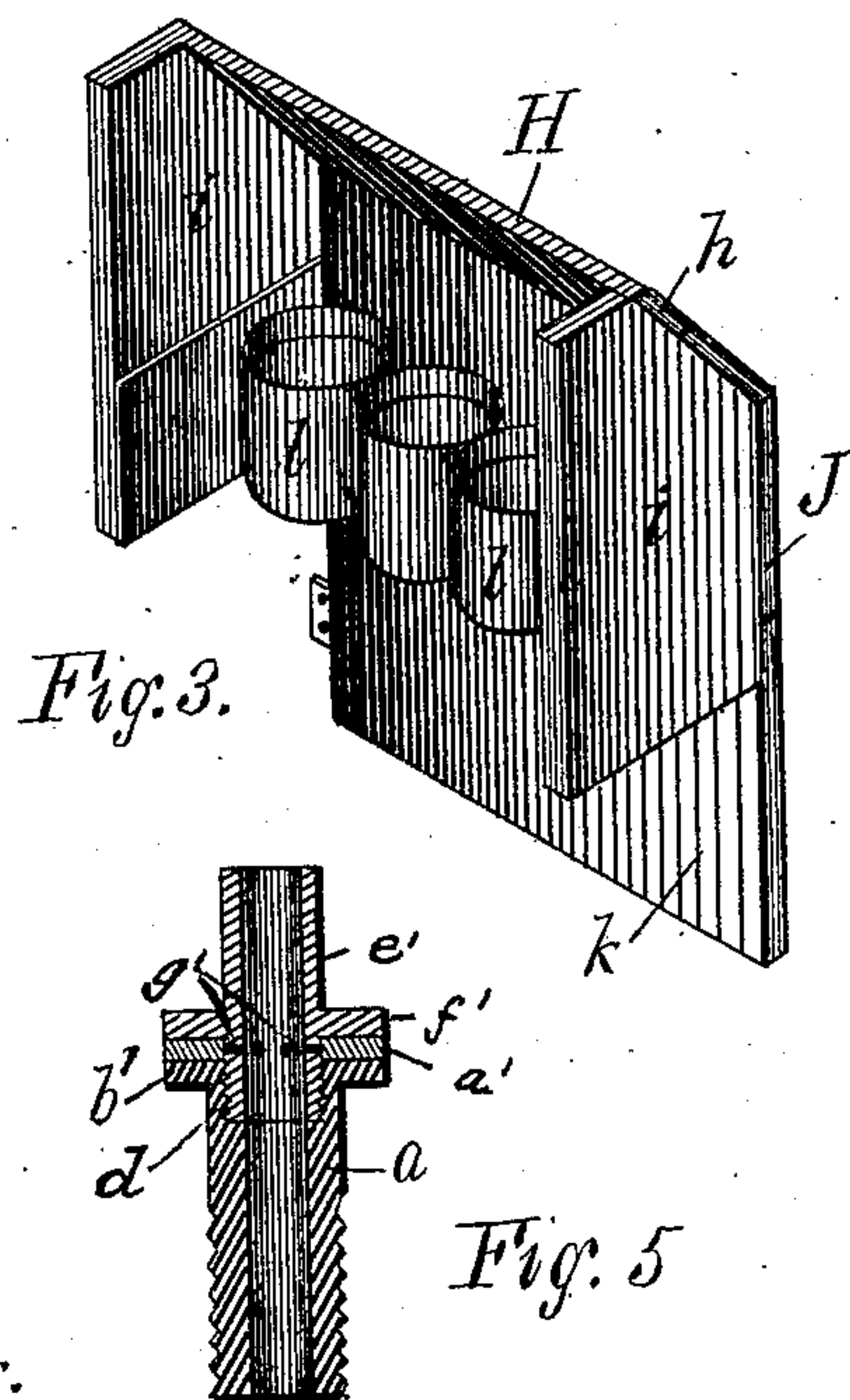
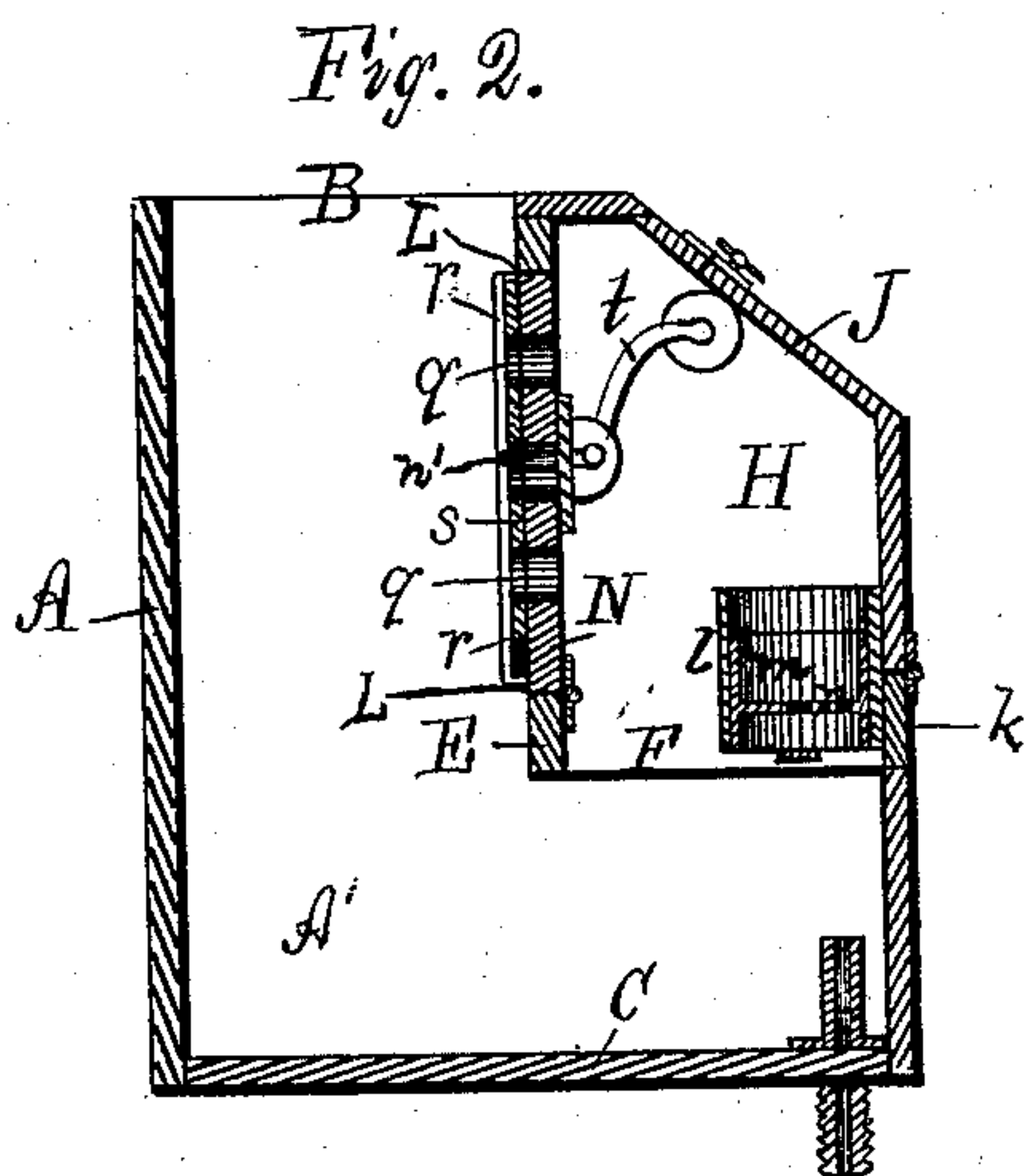
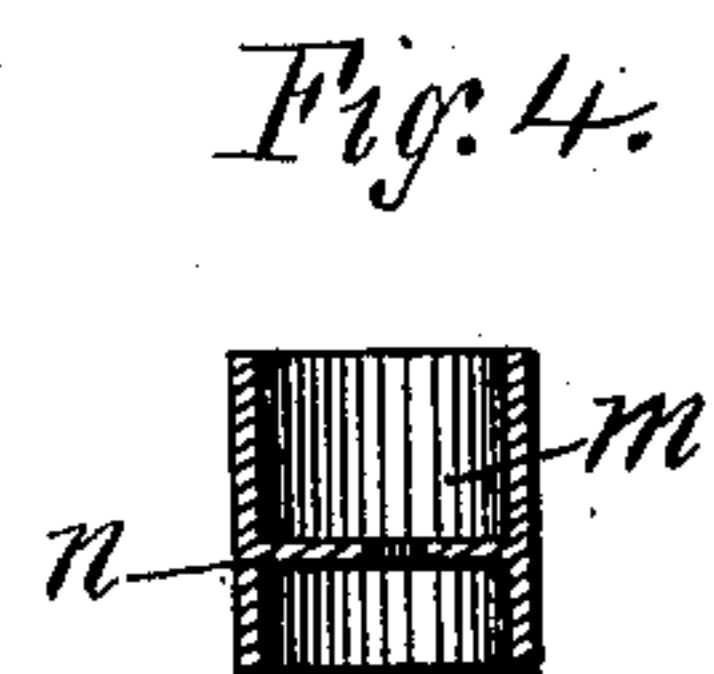
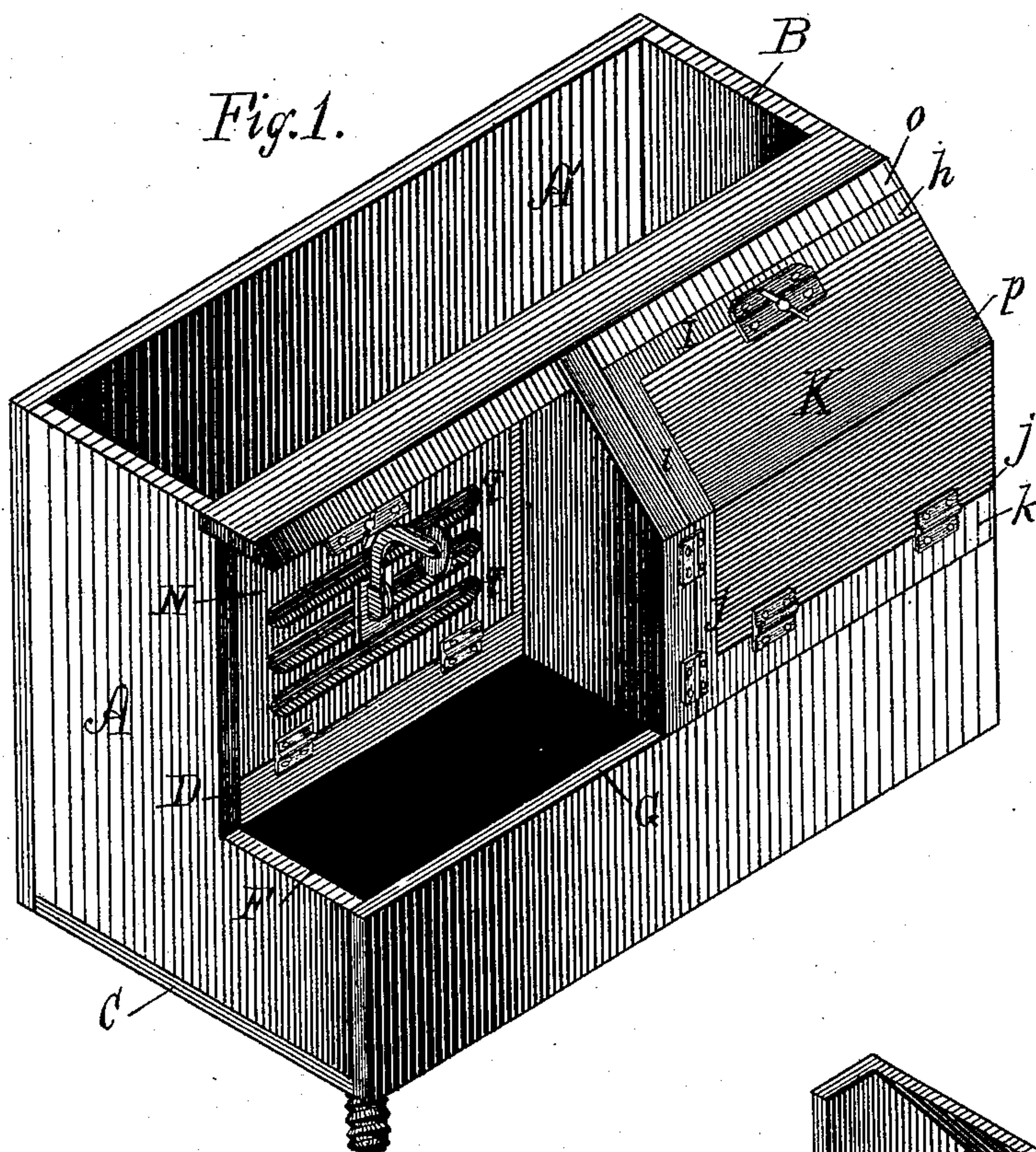


(Model.)

A. D. PUFFER.
REFRIGERATOR.

No. 255,455.

Patented Mar. 28, 1882.



Witnesses.
Geo L. Hall
H. E. Lodge.

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UNITED STATES PATENT OFFICE.

ALVIN D. PUFFER, OF BOSTON, MASSACHUSETTS.

REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 255,455, dated March 23, 1882.

Application filed February 26, 1880. Renewed February 9, 1882. (Model.)

To all whom it may concern:

Be it known that I, ALVIN D. PUFFER, of Boston, county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Refrigerators or Structures, of which the following is a specification.

This invention relates to means for the more effectually preventing waste of ice in refrigerating apparatus or structures, for enabling the refrigerating-vessels to be readily removed, replaced, cleaned, or inspected, or to stand in or out of the ice-water in the tank of the refrigerator, and in means for permitting of escape of waste water rapidly.

The drawings accompanying this specification represent, in Figure 1, a perspective view of structure; Fig. 2, a cross-section of same; Fig. 3, a perspective view of main door holding sirup-cups; Fig. 4, a section of elevating-cup, and Fig. 5 a cross-section of outlet.

A in the above drawings represents the case or box of the structure, being in general terms an upright, oblong, rectangular box with a large opening, B, at top to allow, under some circumstances, of introduction of ice to its ice-chamber, which opening is to be closed by one or more suitable covers, or by the counter of the establishment, the interior A' of the box being for the greater part devoted to the purpose of an ice-receptacle and refrigerating-chamber, a portion of the upper front part of such box being occupied for other purposes, as hereinafter explained.

At a suitable point in the bottom or floor C of the chamber A (in the present instance one front corner) I place the waste-water outlet, which is thus constructed: A tube, *a*, having at top an annular outstanding lip or flange, *b'*, is inserted through an opening in the bottom of the tank, the flange *b'* of the tube bringing up against the said bottom, and being soldered thereto with a tight joint, the upper interior part of the tube being screw-threaded, as shown at *d*, to receive an exteriorly screw-threaded tubular plug, which is shown at *e'* as screwed into it, said plug having an outstanding collar, *f'*, to correspond with the flange of the tube, and a washer, *a'*, of suitable material, being inserted between them to prevent escape of water from the tank. The plug *e'* is pierced immediately below its collar *f'* with several small holes, *g' g'*, &c., and when it is

raised by rotating it the holes *g'* are partially or wholly exposed above the washer *a'* on the top of the tube *a*, as the case may be. Water is permitted to flow from the tank A' through such holes and go to waste from the outlet of said tube. When the collar *f'* of the plug *e'* is screwed down upon the washer *a'* escape of water from the tank is cut off; or the plug may be raised sufficiently to expose a small portion of the holes *g'*, and allowed to remain permanently in this position to permit the waste water to escape slowly from the tank, in which case the amount of external air passing through the holes would be infinitesimal.

In general I prefer that the top of the plug *e'* should be closed and the holes *g'* alone used to discharge the waste water; but the upper end of the plug may be open to constitute an overflow-pipe, should it be desirable to retain a considerable quantity of water in the bottom of the tank.

By means of the plug *e'* the height and quantity of water resulting from the melting of the ice in the bottom of the tank is regulated; but its main purpose is to draw off this water when its temperature becomes too high and allow it to be replaced by water of a lower temperature. The plug permits the waste water to be drawn off rapidly and easily, and allows this waste to be replaced by cold water much more effectually than could be done by simply employing the overflow.

The upper front part of the case A is converted into a bay, D, by means of a vertical wall or partition, E, extending the entire length of the chamber A', the bottom F of the bay being open, as shown, to permit of the sirup-bottles or other refrigerating-vessels being immersed in the ice-water in the lower part of the chamber, when desired. The bay D is open at front, as shown at G, except as provided at each end with doors H I, which are arranged to swing outward, and each of these doors is formed of an open rectangular frame, *h*, whose ends *i i* fill the space between the front and rear of the bay and complete the ends of the box A, the front opening, *j*, of each frame-door H I being closed by an auxiliary or smaller door, J or K hinged at bottom to the lower bar, *k*, of the main door in such manner as to be lowered and expose such opening *j* and the refrigerating bottles or vessels behind it.

To the lower part of one main door—viz., H—I apply a rack or support for the bottles or vessels to contain sirup or other materials to be cooled, such rack in the present instance being
 5 composed of a series of short vertical tubes, *ll*, &c., arranged in a horizontal plane upon the inside of the bar *k*, each tube being of a size to readily receive and sustain a bottle in an upright position, and permit it to be immersed in
 10 the ice water in the lower part of the refrigerating-chamber.

As it may be desirable at times to raise the cooling vessels or bottles above or from out of the ice-water, and yet take advantage of the
 15 low temperature of the ice-chamber, I employ with one or each of the guide-tubes *l* a cylindrical cup, *m*, adapted to closely fill the interior of the tube and rest upon a suitable stop within the latter, the bottom *n* of the cup serving
 20 to support the bottle or vessel. I prefer that these guides should be of metal or some good conductor of heat, in order the more rapidly to reduce the temperature of the contents of the bottles. In order that the extent to
 25 which the bottle is raised above the water may be varied, should occasion require, I place the bottom *n* of the cup much nearer one end than the other, and by reversing the cup end for end the bottle is raised or lowered with respect to
 30 the ice-chamber and above the ice-water. By removing the cup altogether the bottle is immersed in the ice-water through the open bottom of the bay, and it is through this opening that ice is generally introduced to the ice-chamber,
 35 though it may be admitted through the top of the chamber, or, if desirable, through either of the doors H or I. If through the door H, the rear wall, E, of the bay D is pierced by an opening, L, for passage of the ice, such opening
 40 being provided with a drop-door, N. When the bottles are immersed in the ice-water, as explained, they partially descend below the bottom of the main door, and hence the latter cannot be swung upon its hinges and opened, but
 45 access must be had to the bottles by means of the auxiliary doorways; and to enable the bottles to be readily lifted out of their receptacles while the main door is closed I slope the top of the bay rearward, as shown at *o*, and conform
 50 the top of the doors to this slope, as shown at *p*. When all the bottles are raised above the ice-water and rest upon the cups *m* the main door may be swung open and access had directly to such bottles, whether to ascertain if
 55 they need replenishing or to clean them or the parts immediately about them. To merely inspect the bottles the auxiliary door only need be used.

To economize the waste of ice by excluding
 60 external air as much as possible, or by protecting such ice from direct contact with the air, I form in the wall E, or in the door N, as the case may be, a series of horizontal slots or apertures, *q q*, &c., and in rear of such apertures,
 65 and sliding in vertical guides *r r*, I place a register-gate, *s*, such gate operating to open

or close the slots, after the manner of register-gates in general. The openings *q* permit of cold air from the ice-chamber getting access to the bottles, and to exclude external air from
 70 direct entrance to the ice-chamber A' through these openings at such time as the door H or J may be open, I provide means of automatically closing the register-gate when either of the said doors are opened, such means, in the
 75 present instance, consisting of a curved tilting arm or lever, *t*, pivoted at its lower inner end to the front of the wall E, and in front of the openings *q q*, a horn, *n'*, extends from the end of the lever rearward through the gate *s*, in
 80 order to raise and lower the latter. The gate *s* drops by its own gravity to close the apertures *q q* and exclude passage of warm air to the ice, and the descent of the valve raises the outer or free end of the lever *t*. The lever is so
 85 disposed with respect to the door J that as the latter is opened, either alone or by and with the door H, the lever is released and the gate drops and cuts off entrance of air to the ice-chamber so long as the door remains open.
 90 When the door is closed it wipes against and lowers the free end of the lever and raises the gate, and thereby opens the apertures *q q*.

It will be seen that by closing the apertures
 95 *q q* when the door is open the waste of ice is economized; and it will be seen that the opening and closing of the apertures is effected automatically by the movements of the door, and not left to the direction of the attendant.

To lessen friction between the lever *t* and the
 100 door J, an anti-friction roller may be pivoted to the free end of the said lever.

I may use one door to open communication with the ice-chamber and support bottles, or
 105 two or more doors with one or more bottle-supports each may be employed. I do not restrict myself in this respect.

To enable the door H to be firmly applied to the case by providing ample room for its hinges I extend below the door a wing, *b'*, which overlaps the adjacent part of the front of the case.
 110

I claim—

1. The refrigerator-case formed with a bay, as described, in combination with the main door or doors closing the bottom of the bay and
 115 the adjoining face of the refrigerator-case, and the vessel or bottle guides or supports attached to and carried by said door or doors, substantially as hereinbefore set forth.

2. The refrigerator-case formed with a bay, as described, in combination with one or more
 120 main doors closing the bottom of the bay and the adjoining face of the case, vessel or bottle supports or guides carried by said doors, and auxiliary doors, one in each main door, substantially as hereinbefore set forth.
 125

3. In combination with the bayed refrigerator-case, and the door or doors closing the bay and adjoining face of the same, the bottle or
 130 vessel guide-tubes or supports carried by the doors and provided with removable bottoms, substantially as hereinbefore set forth.

4. In combination with the guides *l*, the removable cups or supports adapted to be reversed in position, and in so doing vary the height of their bottom with respect to the ice chamber or tank below, substantially as described.

5. The double door *H J*, in combination with the case *A* and its bay *D*, partition *F*, and apertures *q q*, substantially as and for purposes set forth.

6. The combination, with the double door and the bayed refrigerator-case having communicating openings in the wall or partition between its ice-chamber and the space inclosed by the double door, of means, substantially as described, adapted to be controlled by the aux-

iliary door for automatically opening and closing said openings, substantially as hereinbefore set forth.

7. The waste-water valve composed of the tube *a*, opening communication with the ice-water tank, and the plug *e'*, provided with its apertures *g'*, the tube *e'* screwing into the tube *a*, and the hole serving to open communication between the tube *a* and ice-water tank, while the screwing of the tube *e'* down to its seat shuts off such communication, essentially as explained.

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Witnesses:

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