

W. HOOD.
Ice-Making Apparatus.

No. 160,596.

Patented March 9, 1875.

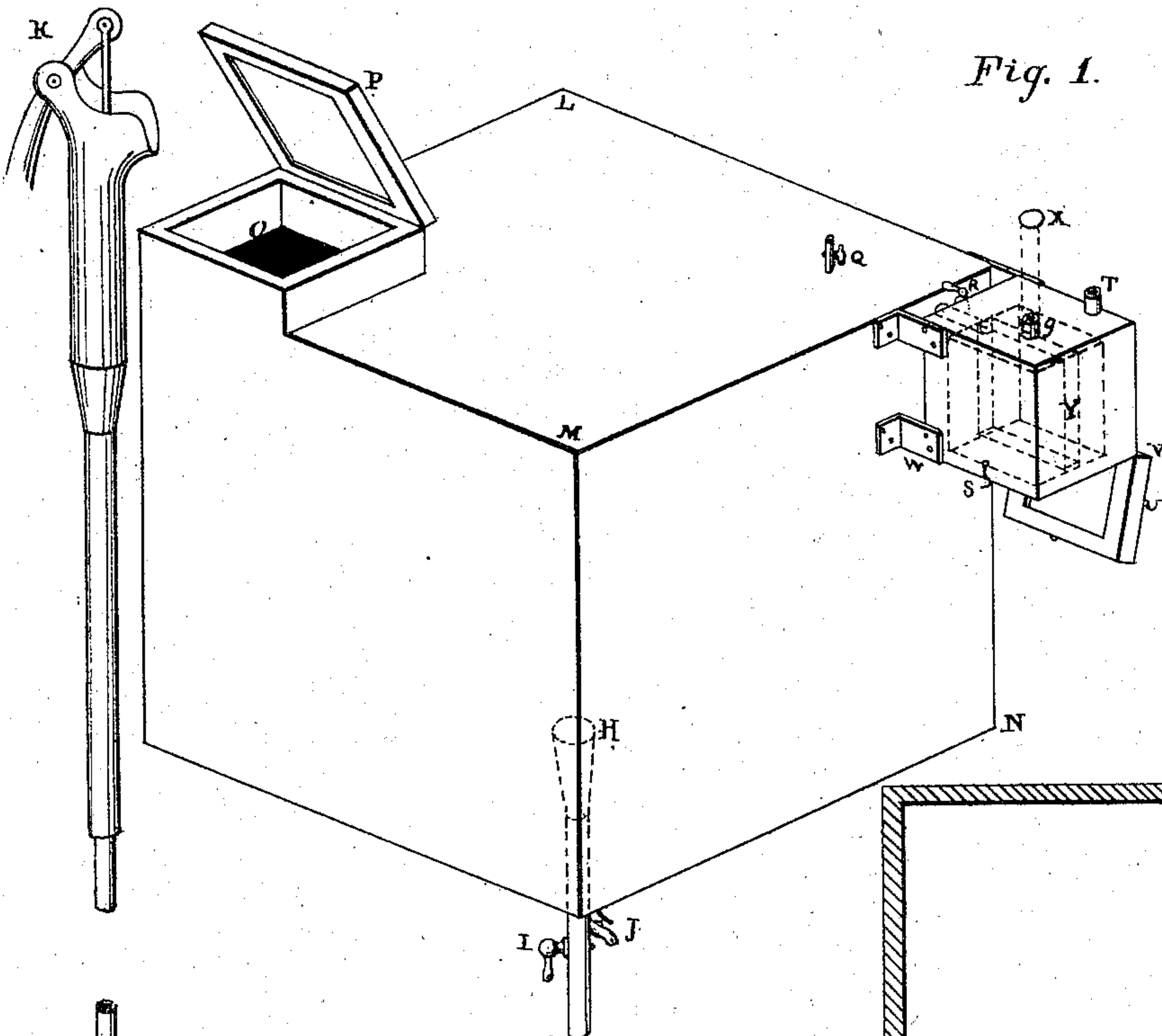


Fig. 1.

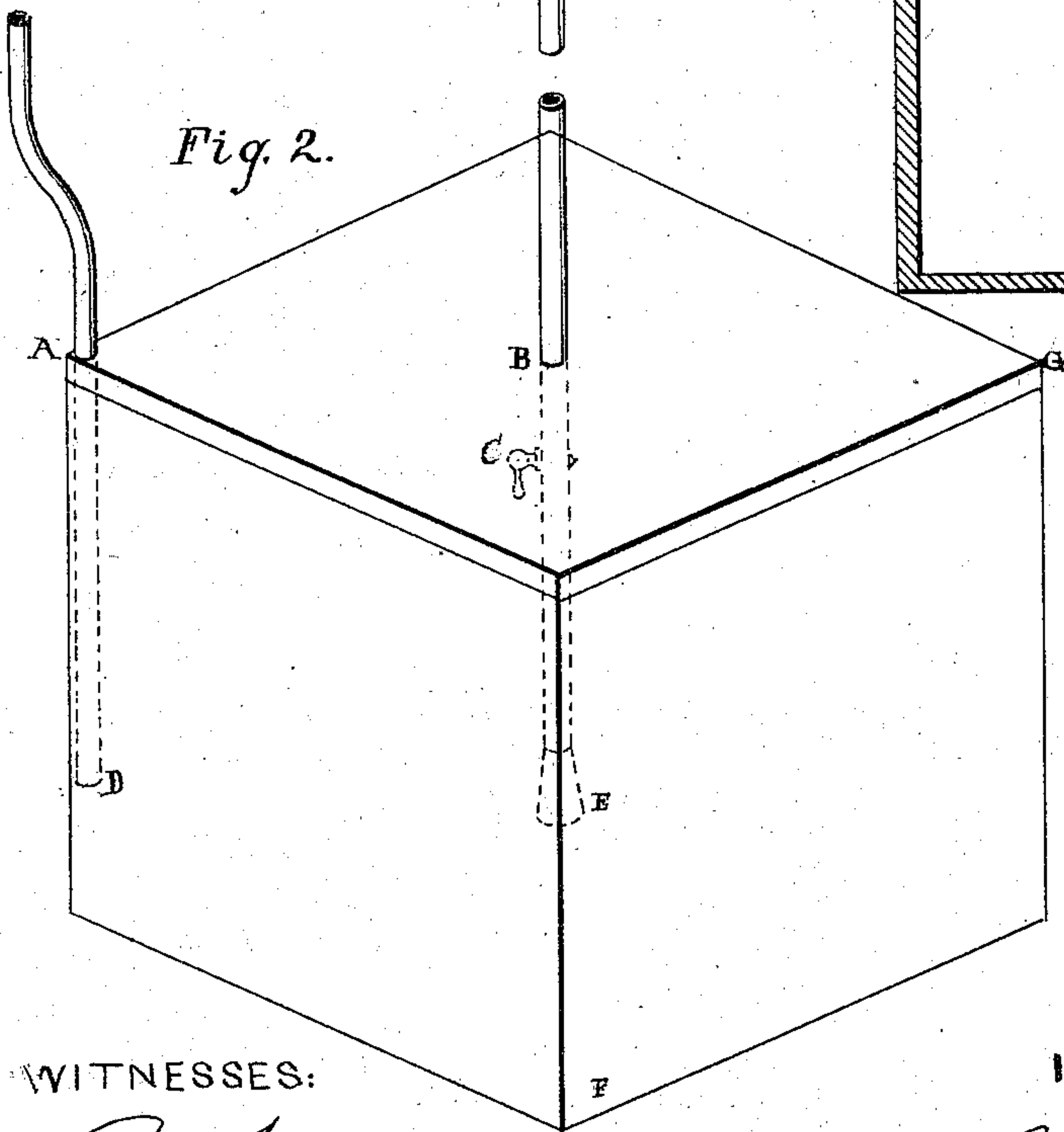


Fig. 2.

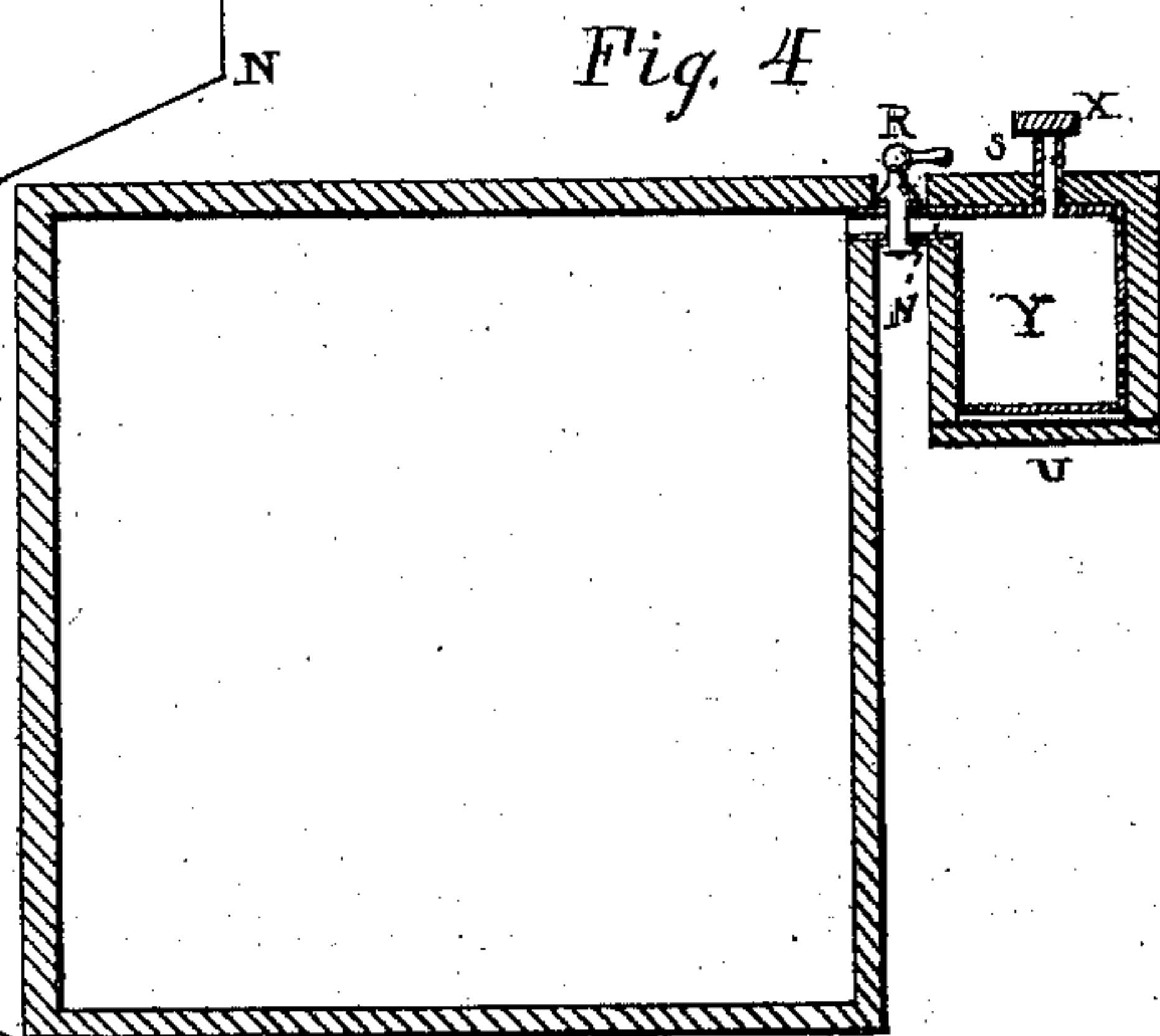


Fig. 4.

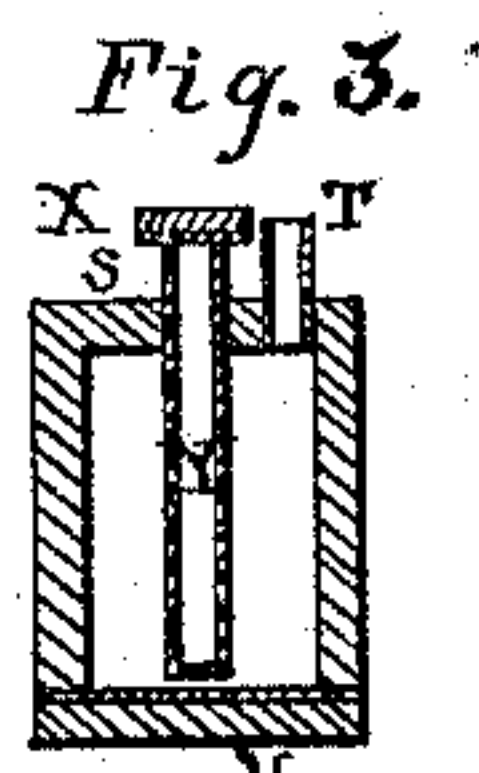


Fig. 3.

WITNESSES:

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WILLIAM HOOD, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN ICE-MAKING APPARATUS.

Specification forming part of Letters Patent No. **160,596**, dated March 9, 1875; application filed October 22, 1874.

To all whom it may concern:

Be it known that I, WILLIAM HOOD, of San Francisco, San Francisco county, California, have invented a new and Improved Ice-Making Apparatus, of which the following is a description, reference being had to the drawing annexed.

Figure 1 is a view of the upper portion of the apparatus; Fig. 2 being a view of the lower portion, the connecting-pipes being broken. Fig. 3 is a section cut by a vertical plane passing through T and S of Fig. 1. Fig. 4 is a section cut by a vertical plane cutting Fig. 1 through R S.

Similar letters of reference indicate corresponding parts.

At L M N is a reservoir, represented in the drawing as cubical, but which may be of any desired form, and of any metal or material sufficiently dense and strong to resist the external pressure of the atmosphere when the interior of the closed reservoir is rendered a perfect vacuum. At O is an opening, which may be made of any shape or size—from a small cylindrical pipe to a large man-hole—but with its upper edges planed smooth and true in one plane. P is a flat metal cover for closing the opening O, and lined with india-rubber packing, in order that it may make an air-tight joint when placed upon the edges of the opening O. Q is a small faucet for admitting air into the reservoir L M N, when desired. H E is a pipe connecting the two reservoirs L M N and A F G, starting from the bottom of L M N, and terminating a few inches above the bottom of A F G. I and C are stop-cocks in the pipe H E, the cock C being placed a few inches below the top of the reservoir A G F, and the cock I being at least thirty-eight (38) feet in vertical height above the cock C. J is a small discharge-faucet, placed immediately over and as close as practicable to the cock I. K is a pump for raising liquid from the reservoir A G F, and pouring it into the opening O of the reservoir L M N. This pump may be as shown in the drawing, a lifting and suction pump combined, or any form of lifting-pump.

The lower end of the suction-pipe D should be a few inches higher than the end of the pipe E, to prevent the latter ever being un-

covered by pumping the liquid from the reservoir A G F.

W V T is a small reservoir, made of wood or metal, opening downward. U is a hinged cover, packed with rubber, so that when closed and fastened in place the reservoir W V T will hold water. T is an opening for pouring in water to the reservoir W V T. Inside the reservoir W V T are one or more small hollow, rectangular, partitional receptacles of copper or some other good conductor of heat. In the drawing the apparatus is represented with but one of these receptacles, Y. If there are more than one, (in large machines,) they all connect by pipes with the pipe in which is the stop-cock R. The hollow partitional receptacle Y connects its interior with the interior of the reservoir L M N by the pipe having the cock R. It also connects its interior with the external air by the pipe S, the top of which is planed, and can be closed by the flat rubber-packed cap X. The receptacle Y is so placed as to leave a small opening between its bottom and the cover U, when the latter is closed.

To make ice by this apparatus the method of procedure is as follows: Put door or cover P open, open stop-cocks I C, close faucets Q and J, and close cock R. Fill the lower reservoir A F G with a fixed non-drying oil, as whale-oil, for instance. The capacity of the reservoir A G F above the pipe E should be equal to that of the reservoir L M N and the pipes K A D and H B E combined. The oil will rise in the pipe B E above the cock C to the level of the oil in the reservoir A F G. Close the cock C. Then pump oil into the upper reservoir L M N until it is full, as well as the pipe H C, to the top edge of the opening O. Close the cover P, and open the cock C. The force of gravitation will cause the oil to then run back through the pipe H E into the reservoir A F G until the reservoir L M N is emptied, and the pipe H E will also be emptied to a point below the cock I, which should then be closed. This will leave the interior of the reservoir L M N a vacuum nearly perfect, and vitiated only by what slight quantities of volatile matter may have evaporated from the impurities of the oil, and by what air the oil may have contained.

While the oil is running down, close the cover U, pour the reservoir W V T partially full of cold water by the opening T, this water rising to an equal height on both sides of the receptacle Y. When the vacuum is ready in the reservoir L M N, pour quickly into Y, through the pipe S, boiling water, and place on S the cap X. Then open the stop-cock R. The rapid vaporization of the hot water which is contained in Y into the vacuum in L M N absorbs the heat from the cold water surrounding Y, and causes it to freeze into ice. To free the ice thus formed, open the cover U, and, if necessary, introduce a little steam into the interior of Y through the pipe S.

The faucet Q may be opened, if necessary, to enable the covers P and X to be opened.

Hot water is used in Y, because a greater weight of hot steam can be contained in the vacuum-reservoir L M N than of cold steam.

For sea-going vessels the cover of the reservoir A F G may be made close-fitting, and an air-vent provided in the shape of a pipe of

small bore, and several feet long, extending vertically from the cover of the reservoir A F G, to prevent the oil from being spilled by the motion of the vessel.

Having thus fully set forth the construction and operation of my ice-making apparatus, what I claim as new, and desire to secure by Letters Patent, is as follows:

The combination, in an ice-making apparatus, substantially as described, of a vacuum reservoir, L M N, the receptacle Y for the water to be vaporized into the vacuum in L M N, connecting-pipe N, having stop-cock R, and the reservoir W V T, containing the water to be frozen into ice, and surrounding the receptacle Y.

In testimony whereof I have hereunto set my hand this 2d day of November, 1874.

WILLIAM HOOD

Witnesses:

R. ARMSTRONG,
HENRY C. BLAKE.