(No Model.) 2 Sheets—Sheet 1.

L. PUSEY.

DEVICE FOR SEVERING ICE.

No. 525,028. Patented Aug. 28, 1894.

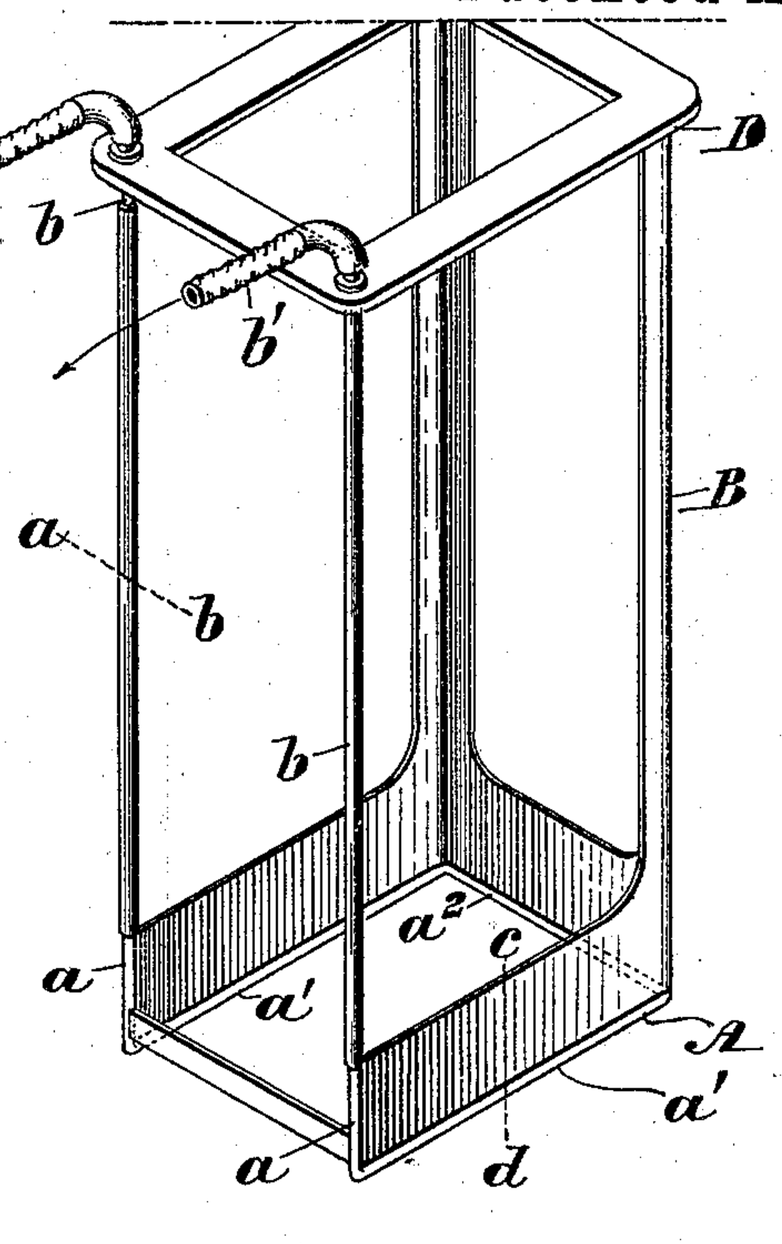


Fig. 1.

Fig. 4.

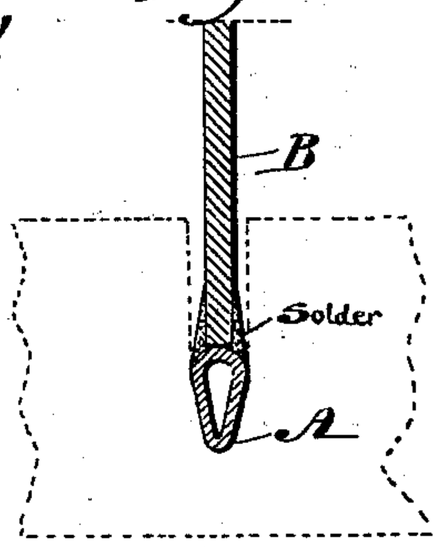
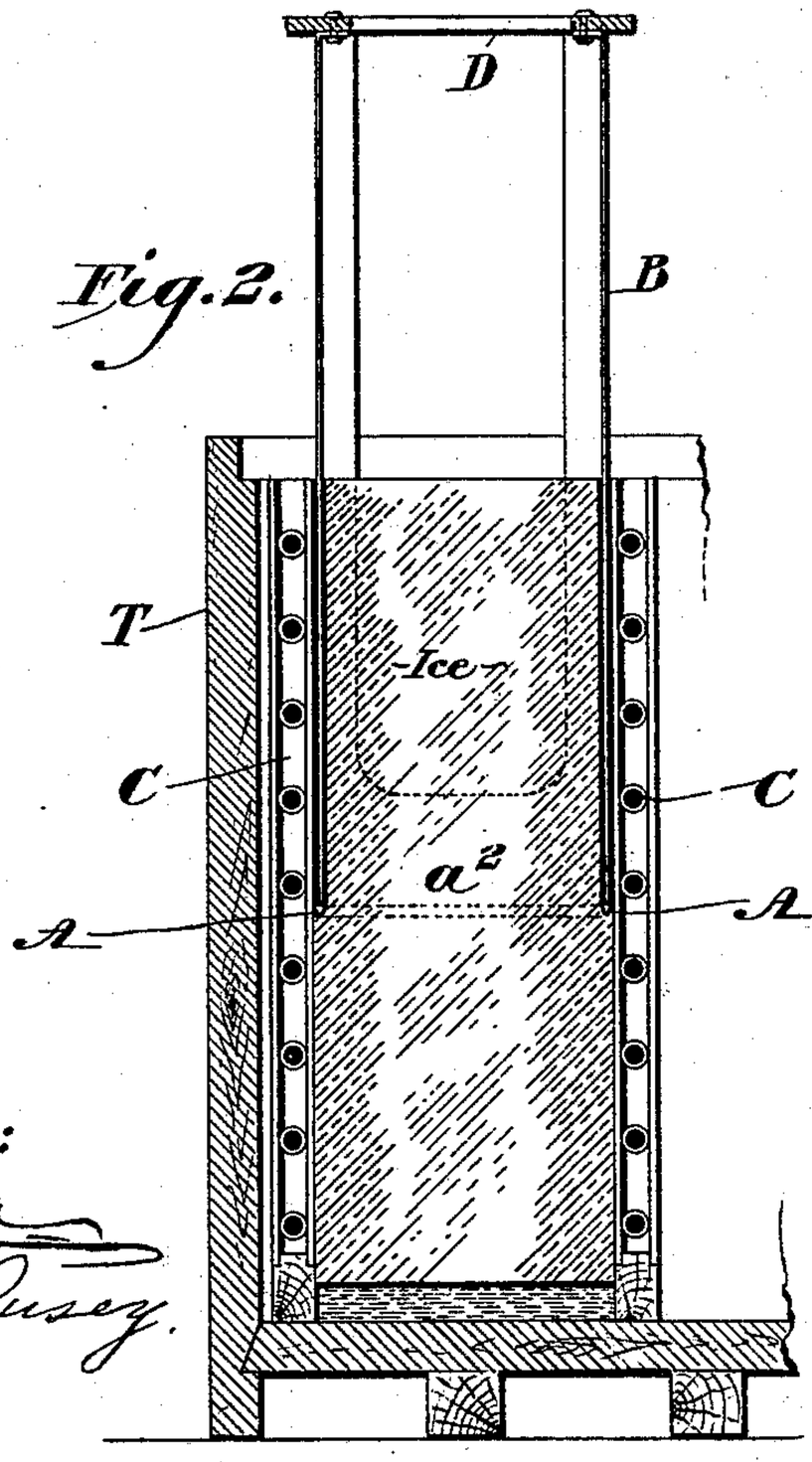


Fig. 3.

Fig. 2.



Witnesses:
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Walter C. Pusey.

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Attorney.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

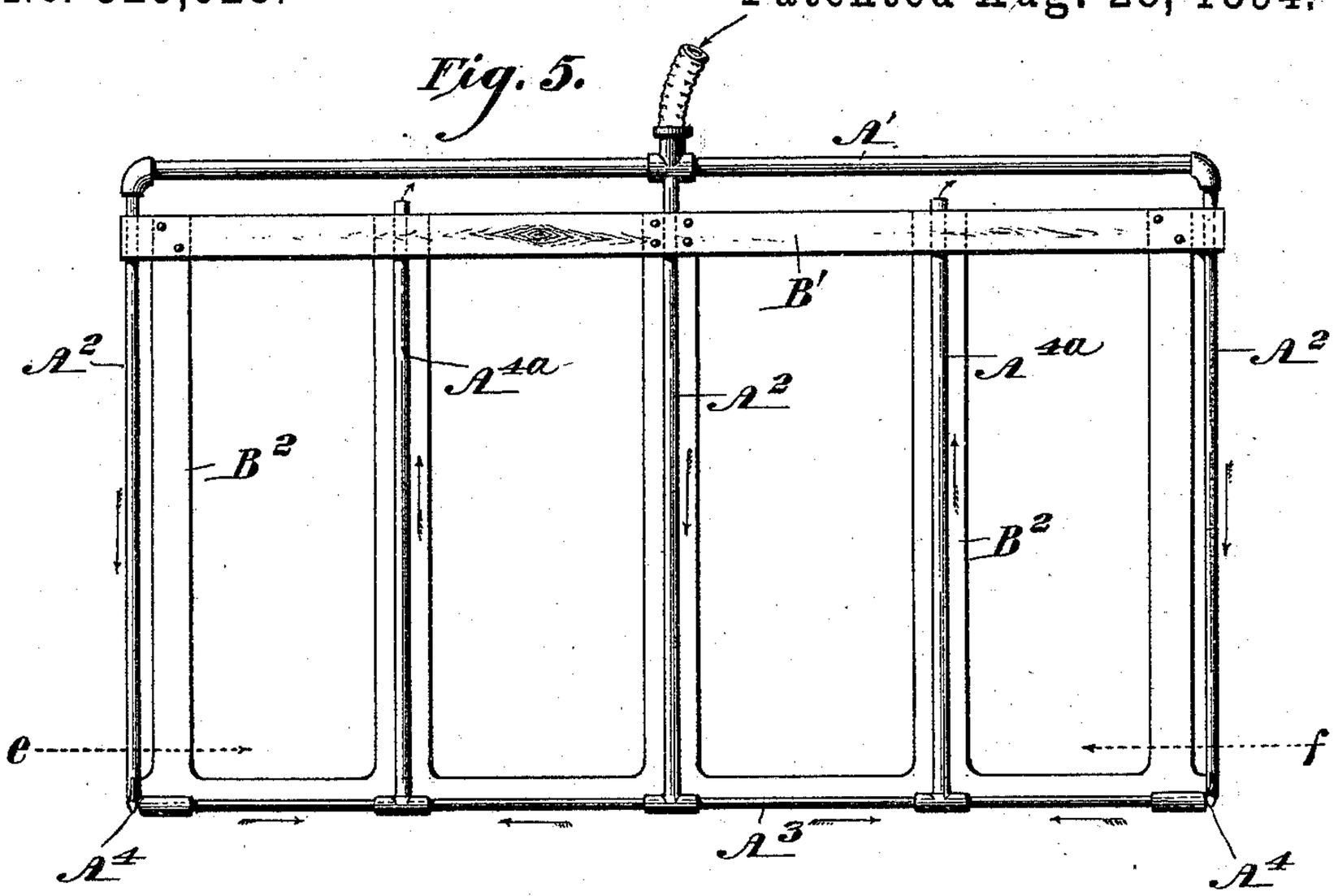
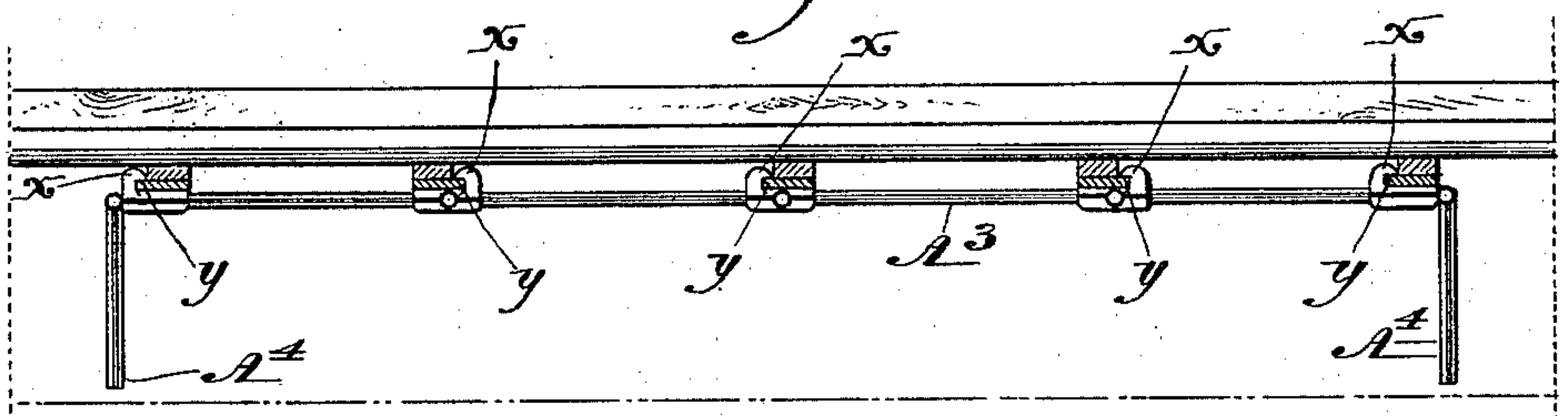


Fig. 6.



Witnesses:
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UNITED STATES PATENT OFFICE.

LEA PUSEY, OF WILMINGTON, DELAWARE.

DEVICE FOR SEVERING ICE.

SPECIFICATION forming part of Letters Patent No. 525,028, dated August 28, 1894.

Application filed February 29, 1892. Serial No. 423,301. (No model.)

To all whom it may concern:

Be it known that I, LEA PUSEY, a citizen of the United States, residing at Wilmington, in the county of New Castle and State of Delaware have invented certain new and useful Improvements in Devices for Severing Ice, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

Figure 1 is a perspective view of one form of the melting-off device. Fig. 2 is a vertical section thereof, as in actual use. Figs. 3 and 4 are sections, enlarged, as on the lines *a b* and *c d*, of Fig. 1, respectively. Fig. 5 is a side elevation of another form of the melting-off device. Fig. 6 is a section as on the line *e f* of Fig. 5, the frame being represented as applied to a freezing tank.

The object of this invention is to provide a simple and efficient means whereby blocks of ice artificially made may be readily separated from the congealers in the usual freezing tanks without defacing or otherwise marring the appearance of the ice. It has heretofore generally been the practice to melt or thaw off the ice from the coils of congealer pipes by passing hot ammonia through the latter. This plan I found objectionable for the reason that the intense heat of the ammonia caused the ice contiguous to the pipes to crack to such an extent as to impair the appearance and the quality of the ice, which was liable to break off in fragments and thus leave a ragged edge or surface; besides, there was a serious loss of economy in making use of the ammonia for melting off. These defects are overcome by my said invention, which consists in the employment of a pipe structure which is adapted to be applied to the block of ice in such manner that when steam or hot water, or other suitable heating medium, is passed through the structure, the latter, so to say, melts or thaws its way down to the bottom of the freezing tank, without making cracks or fractures in the ice, but leaving a smooth even surface, the side of the ice block being, as it were, severed from the congealer.

The invention also comprises details of construction which will be hereinafter pointed out.

Referring to the annexed drawings, particularly to Sheet 1 in which the device is shown in its most convenient form, A represents a pipe, preferably of copper, which is bent into the shape shown, that is to say, to form two short vertical members, *a*, from the lower ends of which project at right angles, two side members *a'* connected by an end member a^2. Extending from the upper or free ends of the vertical members so as to be, in effect, continuations thereof, are vertical pipes, *b*, *b*, respectively. The length of these pipes exceed the depth of the freezing tank, T, in which the ice is formed; and the distance between said pipes and between the side members *a'*, is about equal to that between the inner faces of the respective lateral congealers C in the tank. The length of said side members *a'* corresponds with the thickness or width of the sectional block to be removed, or substantially so.

B represents a skeleton frame of steel or other suitable metal, which is connected with the lower portions of the pipe frame, so as to strengthen and support the same. The upper end of this skeleton frame, and also the upper ends of the vertical pipes *b*, are connected by a rectangular frame D, which braces and supports the parts. Thus, a very strong and substantial structure is provided. The upper or open ends of the vertical pipes extend above the frame D; and these ends are each provided with a flexible, yielding or movable connection *b'*, such as an india rubber tube. One of these connections may be attached to a suitable pipe communicating with a steam or hot water boiler, while the other connection may lead to a convenient point of discharge. When the cock on the boiler pipe (not shown) is opened, the steam or hot water will run through the pipe A *b*, and be discharged by way of the exhaust tube. By reason of the flexible connection or connections the frame is readily movable for the purpose hereinafter described. Assuming it be desired to remove from the tank T, in which water has been frozen in the usual manner, a smooth, uniform block of ice, I place the lower portion, *a'*, a^2, of the pipe A upon the top of the ice, the structure being so disposed that the lateral horizontal members *a'* are between the sides of the congealer pipes C, and the vertical pipes adjacent to the end of the tank. I then turn on the steam or other hot fluid, which in its course heats the pipes *a'* a^2, the

latter thereupon melting or thawing their way down to the bottom of the tank; and this without making crack or flaw in the ice, but leaving thereon a smooth surface. The melting off device may then be applied to the remaining portion of the ice in the tank in like manner, until the entire block has been detached and divided. The vertical pipes do not melt the ice but merely follow the lower or horizontal pipes in their descent, it being understood that the ice does not form close up to the ends of the tank. I prefer to jacket these vertical pipes, with a rubber tube, *d*, or the like, in order to protect them as much as possible from the condensing action of the surrounding water.

Although the horizontal or melting pipe members may be round I prefer to make them oval or egg-shaped in cross-section, the upper or larger portion thereof being soldered to the contiguous edges of the frame B. The soldered portions of the copper pipes are somewhat wider than the thickness of said edges, and the solder is applied in a manner to cover and protect these edges, and thus make a smooth and uniform joint or connection. The said frame being of less thickness than the kerf cut in the ice by the egg-shaped pipe naturally follows the latter with little or no friction. See Fig. 4.

In Sheet 2 of the drawings, I have represented a construction of melting-off frame which is useful, more especially, in connection with those freezing tanks in which the water is frozen in such wise as to leave a central unfrozen water space, and in which tanks it is, therefore, only necessary to separate one side of the block from the congealer pipes. This frame consists of a pipe A′, preferably of water or gas pipe, with depending branch pipes A^2, which support a lower horizontal pipe A^3, by preference of copper, the ends A^4 of which are bent out laterally at right angles to the body of the pipe. B′ is a bar of wood or other rigid material, connecting the branch pipes near their junction with the main pipe; and B^2 indicates metallic reinforcing strips soldered to the pipe A^3 and to the vertical pipes similarly to the metallic frame in the first described construction. The pipe A′ is likewise provided with a flexible hose for connection with a steam or hot fluid conducting pipe. To use the frame, the pipe A^3 is placed horizontally against the sides of the supporting irons of the congealer pipes, and the steam or heating fluid is turned on. This of course heats the pipe, and as the frame is held in a vertical position, the pipe melts its way down to the bottom of the vessel, thereby separating the ice block from the congealer. The melting off device may then be applied to the other side of the tank so as to separate that block in like manner.

I prefer to provide the frame with a couple of exhaust pipes A^{4a} that rise from the melting off pipe A^3 so as to extend through and above the brace-bar B′. The upper or free ends of the pipes are open to permit the escape of the steam or other fluid to a convenient point. I also prefer to provide the T's or unions which connect the vertical pipes with the pipe A^3 with recessed projections, *x*, that are adapted to engage vertical shoulders or flanges, *y*, on the supporting irons of the congealer pipes, when the melting off frame is in service. By this construction, the frame is guided in its vertical movement, and thus a clean straight cut effected. See Fig. 6.

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

1. The portable melting off device, adapted for separating artificial ice in and from freezing tanks, consisting of the horizontal heat conductor member, the vertical conductor members communicating therewith, one of the latter being the inlet and the other the outlet for the heat agent, the flexible or yielding connections thereon, together with the rigid supporting frame, all combined, constructed, and adapted to operate substantially as and for the purpose set forth.

2. A portable melting off device, consisting of the rigid supporting frame, the horizontal pipe on the lower edge of said frame, the reinforcing strips secured to the upper side of said pipe, the vertical inlet and outlet pipes communicating with said horizontal pipe, together with the flexible or yielding pipe connections on the free end of said inlet and outlet pipes respectively, substantially as and for the purpose set forth.

3. The combination with the freezing tank, of the melting off device, consisting of the horizontal heat conductor members, the vertical inlet and outlet conductor members communicating therewith, the flexible or yielding connections attached to the free ends of said inlet and outlet conductors, together with the rigid supporting frame, said melting off device being adapted to be entered in the freezing tank and guided by the sides of said tank, the construction, combination, and operation being substantially as and for the purpose set forth.

4. The combination with the melting off pipe, oval in cross-section, or practically so, of the reinforcing strip or frame fastened to the upper edge of said pipe, the said strip or frame being of less width than said edge, substantially as described.

5. The combination with the melting-off pipe, oval or practically so in cross-section, of the thinner reinforcing strip or frame soldered to the upper edge of said pipe so as to cover and protect the said edge, substantially as described.

In testimony whereof I have hereunto affixed my signature this 1st day of October, A. D. 1891.

LEA PUSEY.

Witnesses:
JOSHUA PUSEY,
JOHN R. NOLAN.