

No. 659,157

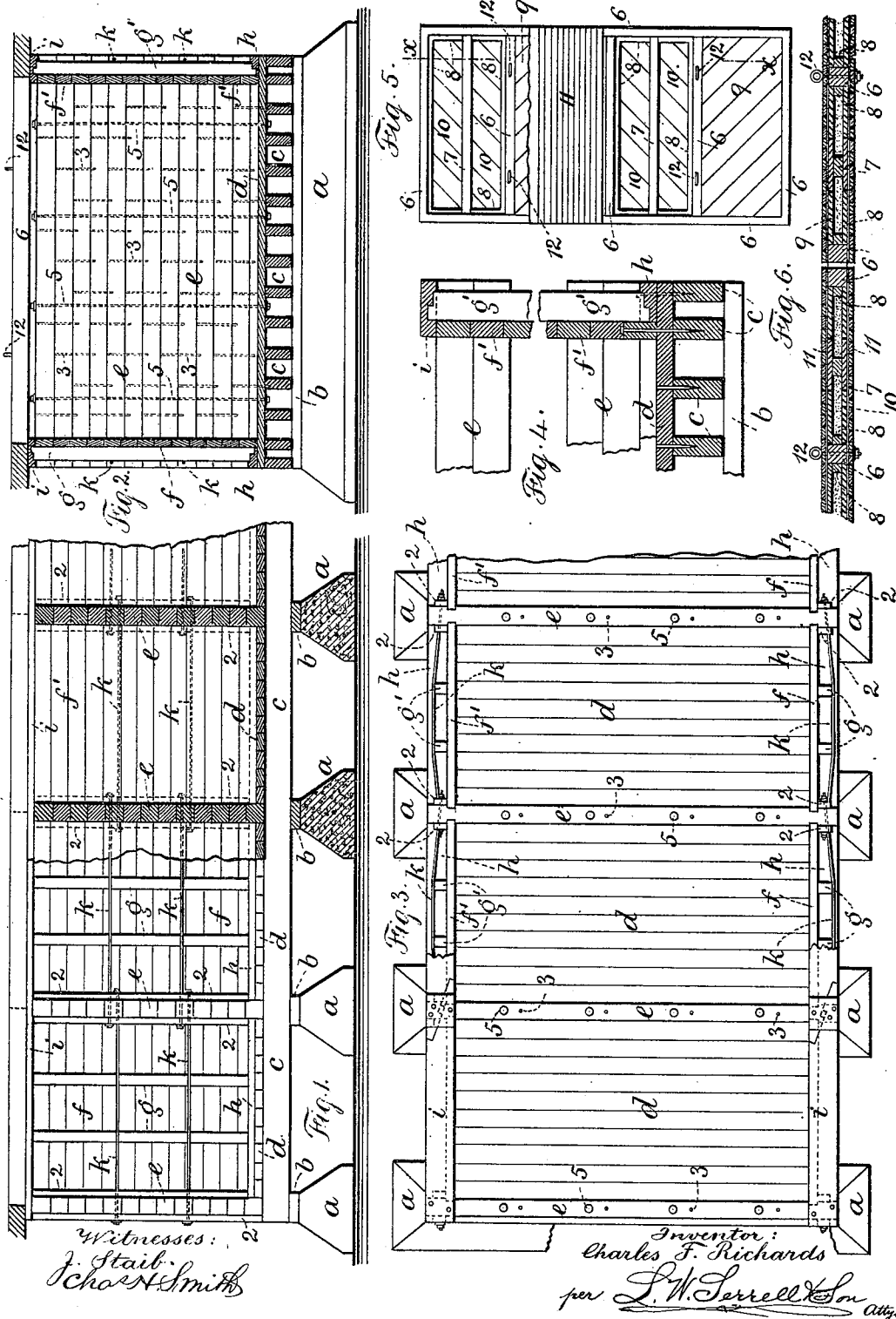
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C. F. RICHARDS.

FREEZING TANK FOR MANUFACTURING ARTIFICIAL ICE.

(Application filed Nov. 24, 1899.)

(No Model.)



UNITED STATES PATENT OFFICE.

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FREEZING-TANK FOR MANUFACTURING ARTIFICIAL ICE.

SPECIFICATION forming part of Letters Patent No. 659,157, dated October 2, 1900.

Application filed November 24, 1899. Serial No. 738,133. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. RICHARDS, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Freezing-Tanks for the Manufacture of Artificial Ice, of which the following is a specification.

My invention relates to a tank for holding water to be frozen in the process of manufacturing artificial ice, and the same relates solely to the tank and has no reference whatever to the devices associated with the freezing of the water. Heretofore in these tanks it has been very difficult to prevent leakage and also to prevent the twisting or buckling or otherwise displacement of the parts going to make up the tank, which displacement was sure to lead to leakage. In carrying out my invention I provide a novel arrangement and combination of parts for the production of a tank of great strength and at the same time one in which any section of the tank may be repaired without disturbing an adjacent section. The tank is built up upon a foundation of beams, boards, and bulkhead-timbers, with posts, sills, and tie-rod bracing in such a manner as to form a stiff and substantial wooden structure the joints of which are thoroughly and carefully calked in the manner of calking the planks of a vessel, the arrangement of which is more particularly hereinafter set forth.

In the drawings, Figure 1 is a vertical longitudinal broken section. Fig. 2 is a cross-section. Fig. 3 is a plan, and Fig. 4 a vertical corner section, of parts of the tank. Fig. 5 is a plan view of the cover, showing it with different stages of its construction; and Fig. 6 is a partial section of the cover at the line *x x*, Fig. 5. Figs. 4 and 6 are in enlarged size for clearness.

I provide concrete foundation-blocks *a*, placed transversely of the tank, and upon these are laid wall-plates *b*. Longitudinal beams *c* are placed upon the wall-plates at right angles thereto, and these longitudinal beams support the floor-boards *d* and the bulkheads *e*, placed transversely of the longitudinal beams and secured directly thereto. The floor-beams are heavy, and the bulkheads are

timbers alike and built up the one on the other to the desired height and spaced the desired distance apart, according to the size of the tank required. The sides *ff'* of the tank-sections between the bulkheads are heavy boards set edgewise, with their respective ends let into grooves in the opposite faces of the bulkhead-timbers. The distance from side to side of the tank-sections is somewhat less than the length of the concrete foundation-blocks *a* and the wall-plates *b* thereon, so that the bulkheads *e* project beyond the sides *ff'* and are of approximately the length of the wall-plates *b*. Between the bulkheads *e*, outside of the side boards *ff'*, are placed the posts *g g'*, with their upper and lower ends notched. I provide a subsill *h*, resting upon the flooring-boards *d* and running parallel with the sides *ff'*, and between the same and the sides the notched lower ends of the posts are received. I also provide a top plate *i*, notched and setting over the notched upper end of the posts, the top plate being secured down to the posts and the upper edges of the sides *ff'*, and I employ truss-rods *k*, running from bulkhead to bulkhead and passing through the bulkheads and crossing therein, so that each truss-rod passes through one bulkhead behind two or more posts and through the next bulkhead, so as to tie the posts to and against the sides of the tank-sections, so that the pressure produced upon the sides by the weight of confined water will be taken by the sides and the posts and the truss-rods and communicated to the bulkheads and be supported by the solid bulkheads, which, as will be seen from the drawings, extend entirely across and form the divisions between the tank-sections. I employ a peculiar manner of fastening the bulkhead-timbers together, as will be seen by the cross-section, Fig. 2—that is to say, dock-spikes *3* pass through two bulkhead-timbers and down into a third timber, and these dock-spikes are staggered in their relation as the bulkhead-timbers are built up, and tie-rods *5* pass down through all the bulkhead-timbers to tie the same together. By reference to Fig. 4 it will be noticed that the floor-boards are secured to the longitudinal crossing beams by dock-spikes and that the lowermost boards of the sides *ff'*

are secured to the flooring-boards and the longitudinal beams by lag-screws that pass down through said boards and through the flooring-boards *d* and the longitudinal beams *c*, and by reference to Fig. 3 the manner of placing the truss-rods will be apparent, the same passing through and crossing in the ends of the bulkheads and through corner-posts 2 at opposite sides of the bulkheads, which corner-posts come against the joint formed at the outside between the sides *ff'* and the bulkheads. All of the joints between the respective parts are to be carefully calked in the manner usual in calking the timbers of a ship, so as to make the tank-sections thoroughly water-tight and prevent leakage, and it will be noticed that the manner of building up the tank-sections of the various parts facilitates the calking operations. It will be further observed that the construction is such that each tank-section is practically independent of each other and adjacent tank-section, so that in case repairs are needed to any particular section the parts thereof can be disconnected and repaired and the parts of the adjacent tank-sections will be self-supporting.

I provide covers for the tank-sections, which covers in practice, as usual in the construction of these freezing-tanks, become part of the floors of the building devoted to the manufacture of artificial ice. These covers fit over and rest upon the tops of the transverse bulkheads and top plates. Each of the covers are composed of side, end, and crossing strips 6, forming a frame, and with intermediate crossing-strips 7 and lining-strips 8. The space between these strips is filled in with non-conducting material, such as sawdust or mineral wool. The frame of strips 6 and 7 is surfaced with boards. The upper and under surfaces are composed first of the diagonal strips of boards 9 and 10, the strips 9 being shown on the upper surface and the strips 10 on the under surface. These diagonal strips are cut to fit the spaces between the strips 6 and rest upon and are nailed to the strips 7 and 8, so that when the diagonal strips 9 and 10 are in place their outer surfaces are presumed to be flush with the outer surfaces of the strips 6. Both faces are then lined with such material as heavy paper and the two surfaces are then provided with transverse strips nailed down to place. I prefer to employ four of the crossing-strips 6 in the frame, two of the strips being adjacent through the center of the cover and spaced apart a short distance, at which place the transverse cover-strips 11 are stopped, so that there is a narrow transverse slot entirely through the center of the cover. This is to be filled up by a removable strip or tongue, the object of this slot being to measure the thickness of the ice forming in the tanks without the necessity of removing the cover. The transverse strips 6 between the center and the ends of the cover are provided with

eyebolts 12, to which chains are fastened, so that the cover may be raised by suitable power and removed from the top of the tank-section. These covers are all alike and as constructed serve to prevent the cold from the freezing mixtures in the tank escaping by radiation.

I claim as my invention—

1. In a freezing-tank for the manufacture of artificial ice, the combination with a suitable foundation, of longitudinal beams supported thereby, the transverse flooring-beams and bulkhead-walls spaced apart and means for securing the same to the longitudinal beams, sides between the bulkheads with the ends let into grooves formed in opposite faces of the bulkheads and with posts between the bulkheads and outside of the sides, and truss-rods passing through the bulkheads and over the posts to bind the parts together and stiffen the tank-sections, substantially as set forth.

2. In a freezing-tank for the manufacture of artificial ice, the combination with a suitable foundation, of longitudinal beams and transverse flooring-boards laid thereon and secured thereto and bulkheads dividing the tank into sections and placed transversely of the beams, and dock-spikes for connecting the said timbers forming the bulkheads said spikes passing down through two of the timbers into a third and being staggered in relation to one another as the bulkheads are built up, and tie-rods passing down through all the bulkhead-timbers to securely connect the same together and prevent spreading during the calking operation, substantially as set forth.

3. In a freezing-tank for the manufacture of artificial ice, the combination with a suitable foundation, of longitudinal beams placed thereon and flooring-boards placed transversely of the longitudinal beams, bulkheads also placed transversely of the beams and spaced apart to provide tank-sections, the sides *ff'* extending between the bulkheads with the respective ends let into grooves upon opposite faces of the bulkheads, posts between the bulkheads and outside of the sides and tie-rods passing through the bulkheads and over the intermediate posts to clamp the respective sides and bulkheads together and to hold the sides against outward pressure, substantially as set forth.

4. In a freezing-tank for the manufacture of artificial ice, the combination with concrete foundation-blocks and wall-plates thereon, of longitudinal beams at right angles to the wall-plates and foundation-blocks, transverse flooring-boards laid upon the said longitudinal beams, bulkheads built up of timbers also resting upon the longitudinal beams and dividing the tank into sections, sides extending between the bulkheads with the respective ends of the sides received in recesses or grooves in opposite faces of the bulkheads, a subsill and a top plate outside of the sides and between and over the respective ends of

the bulkheads, posts with notched ends between the bulkhead ends and outside of the sides, the notched ends resting between the subsill and sides and the top plate and sides, and truss-rods extending from bulkhead to bulkhead outside of the posts to bind the parts together and to withstand outward pressure of the water, substantially as and for the purposes set forth.

10 5. In a freezing-tank for the manufacture of artificial ice, the combination with the sides and bulkheads forming supports, of removable covers each composed of a frame of strips with diagonal and transverse boards
15 upon the opposite surfaces and filling-strips of non-conducting material between the same, and a filling of non-conducting material between the strips of the frame and means for elevating the covers, substantially as set
20 forth.

6. In a freezing-tank for the manufacture of artificial ice, the combination with the sides and bulkheads forming supports, of re-

movable covers each composed of a frame having sides, ends and transverse strips of the same size with two adjacent strips transversely through the center and with other transverse strips and lining-strips narrower than the strips of the frame, diagonal board strips in the spaces between the strips of the frame and secured to the narrower strips, a filling of non-conducting material between the diagonal board strips and the frame-strips, linings of non-conducting material upon the surface of the diagonal boards and transverse
35 board strips upon opposite faces of the cover, there being a narrow transverse slot through the center of the cover for the purposes described, and means by which the cover is raised, substantially as set forth.

Signed by me this 11th day of November, 1899.

CHAS. F. RICHARDS.

Witnesses:

GEO. T. PINCKNEY,
E. E. POHLÉ.