

*Greenlee & Redfield,*

*Liquid Cooler.*

*No. 90,094.*

*Patented May 18, 1869.*

Fig. 1.

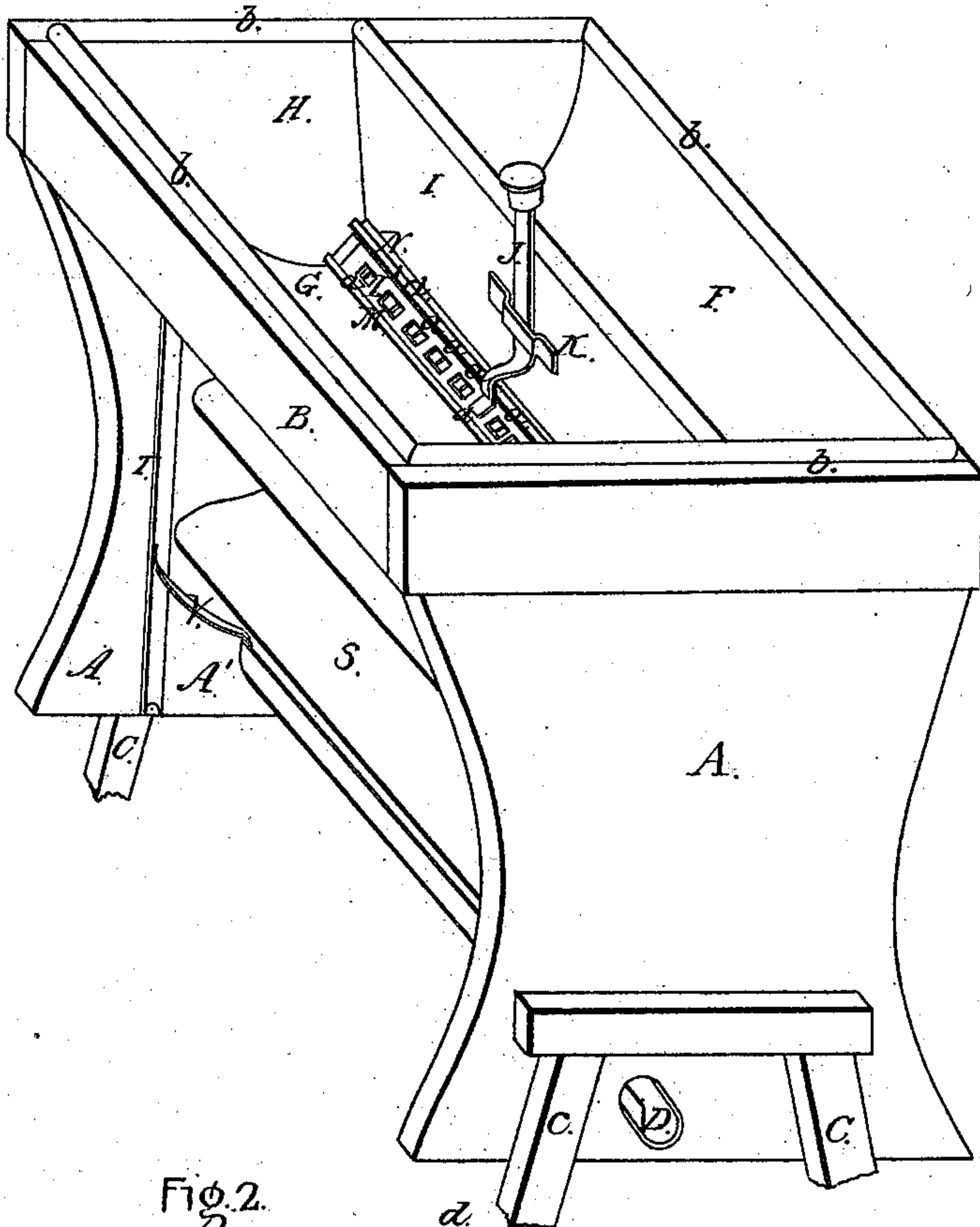
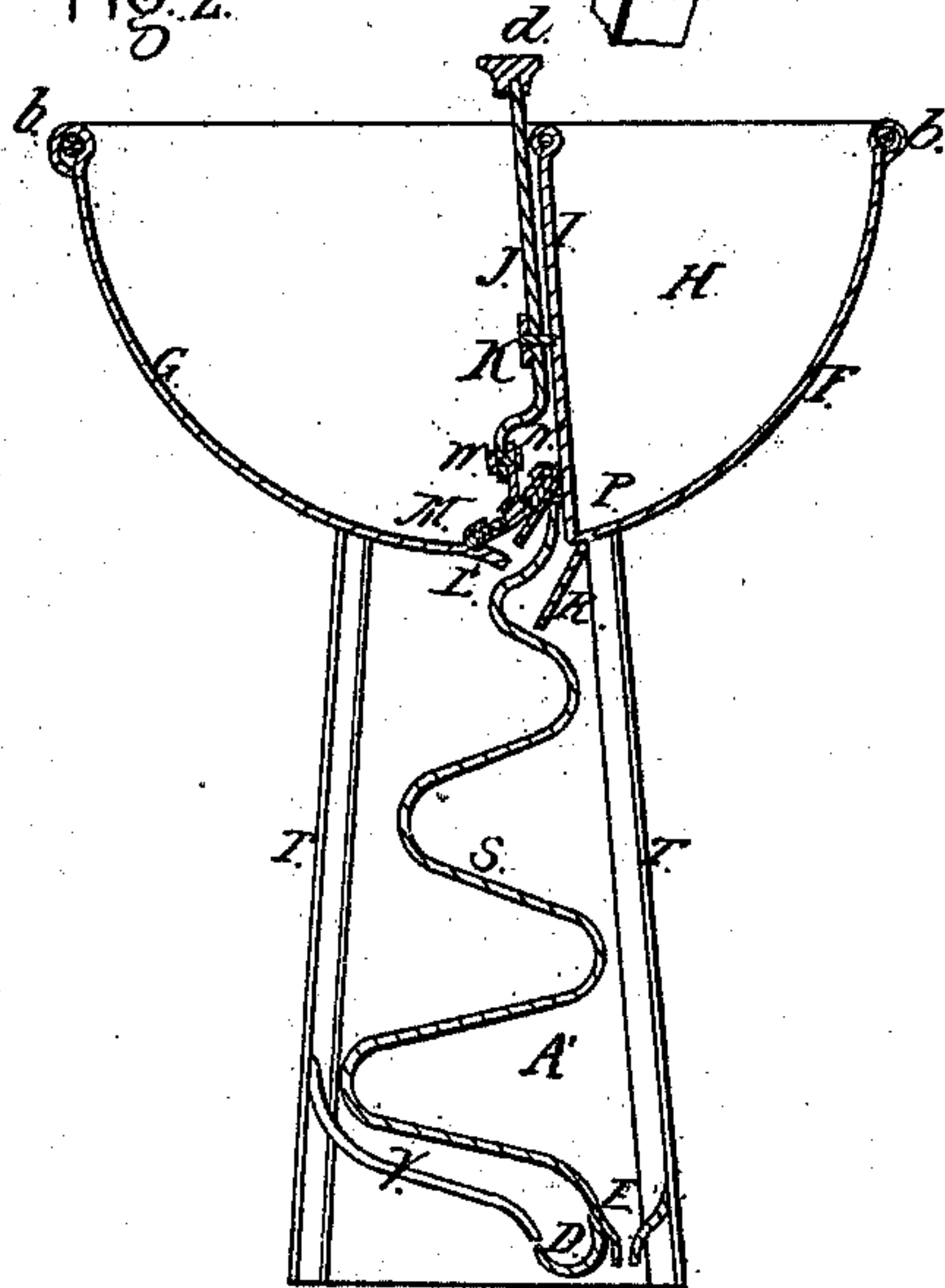


Fig. 2.



Witnesses:

*E. S. Gibson*  
*J. L. Meriam*

Inventors:

*Charles Greenlee*  
*Wm. H. Redfield*  
*G. Schapin*

*By these attorneys*



# United States Patent Office.

CHARLES GREENLEE AND WILLIAM H. REDFIELD, OF BELVIDERE,  
ILLINOIS.

*Letters Patent No. 90,094, dated May 18, 1869.*

## IMPROVED APPARATUS FOR COOLING LIQUIDS.

The Schedule referred to in these Letters Patent and making part of the same.

### *To all whom it may concern:*

Be it known that we, CHARLES GREENLEE and WILLIAM H. REDFIELD, of Belvidere, in the county of Boone, and State of Illinois, have invented an Improved Apparatus for Cooling Liquids; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, and letters marked thereon, making a part of this description, in which—

Figure 1 is a perspective representation of our invention.

Figure 2, a transverse sectional elevation of the same, with the supporting-frame removed.

The nature of the present invention consists, in general terms, in the novel construction of a two-part tank, which receives the liquid to be cooled, and the cooling-material, and operates with a corrugated cooling-surface, the lower end of which is provided with spouts, to conduct the fluids into suitable receptacles.

H represents a semicircular tank, which is made of metal or other suitable material, and divided into compartments F G, by means of a partition, I, and which is so arranged as to be held in place by a rim, *b b b*, bearing on a substantial frame, A A.

A recess is formed in the bottom of the tank, adjoining the partition I, by means of an inclined plate, P, fig. 2, secured to said partition and to the ends of the tank.

The object of this recess is to allow the upper end of a corrugated plate, S, so to extend above the openings in the bottoms of the apartments F G as to prevent the liquid to be cooled from mixing with the cooling-substance.

The plate S is made of any metal which will not corrode, and it is so bent or corrugated as to give a large cooling-surface in a short space, as shown in both

figures, and it terminates at the bottom in spouts D E, and has its ends fastened to plates A', supported by the frame A.

These plates have grooves T formed in their edges, to catch any liquid which might otherwise be wasted, and conduct it into the troughs D E, projecting flanges V being used on one side of the plate S, to complete the channel to the trough D.

A gate, L, is arranged to operate in guides M N, by means of a lever, J, pivoted to it, and to the partition I, at K, and it has a series of holes, *a a*, &c., made through it, corresponding in number to the number of holes made through the lower angle of the apartment G, by means of which the flow of cooling-substance is controlled.

### *Operation.*

The liquid to be cooled is placed in the apartment F, and the cooling-liquid in the apartment G, and as the former passes through holes in the lower angle of the apartment F, and down, in a thin sheet, over one side of the corrugated plate S, and into the spout E, the cooling-liquid passes down the other side, and thus reduces the temperature of the liquid to be cooled, correspondingly to the cooling-liquid.

Having thus fully described my invention,

What I claim, and desire to secure by Letters Patent of the United States, is—

The tank, provided with apartments F G, in combination with plate A', provided with grooves T, and corrugated plate S, provided with troughs D E, and gate L, as described.

CHARLES GREENLEE.  
WM. H. REDFIELD.

Witnesses:

G. L. CHAPIN,  
E. E. GIBSON.