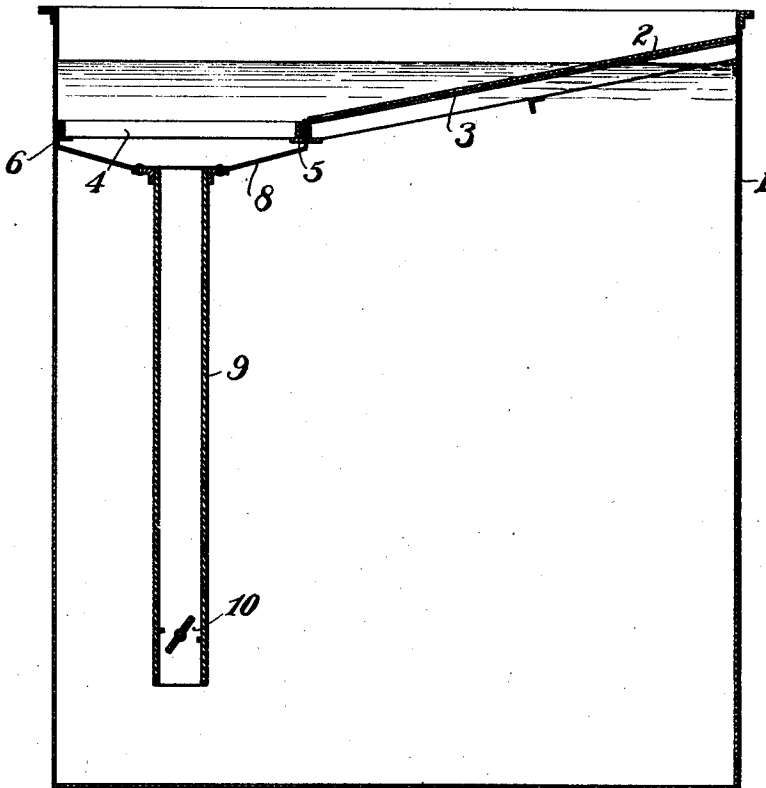
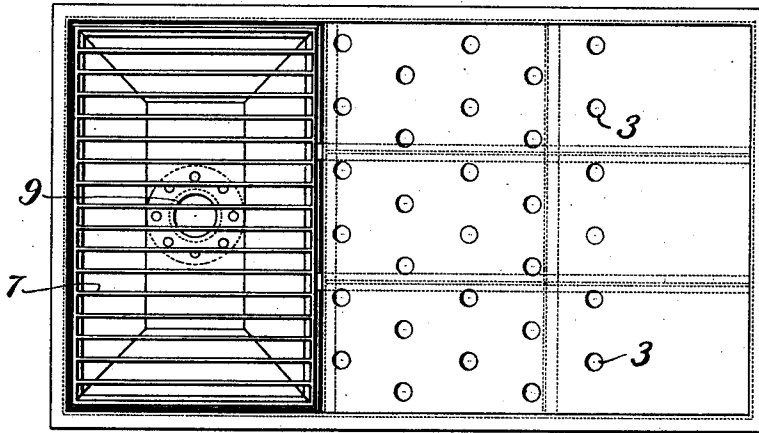


W. E. LUMMUS.
DISSOLVING TANK.
APPLICATION FILED JUNE 29, 1908.

1,063,707.

Patented June 3, 1913.

FIG. 1.



WITNESSES

Alice Ackroyd
M. L. Gilman.

FIG. 2.

INVENTOR

Walter E. Lummus
by his Attorney
Phillips Van Euren & Co.

UNITED STATES PATENT OFFICE.

WALTER E. LUMMUS, OF LYNN, MASSACHUSETTS.

DISSOLVING-TANK.

1,063,707.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed June 29, 1908. Serial No. 440,841.

To all whom it may concern:

Be it known that I, WALTER E. LUMMUS, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Dissolving-Tanks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to an improvement in dissolving tanks.

The object of this invention is to produce a dissolving tank for making solutions of salts which will operate automatically to produce solutions without the intervention of the operator.

This invention is particularly useful in making solutions of caustic soda and other solutions similarly dangerous to the human body.

The invention consists in the dissolving tank hereinafter described and particularly defined in the claims.

In the accompanying drawings, illustrating the preferred form of the invention, Figure 1 is a plan and Fig. 2 is a central longitudinal vertical section.

In the embodiment of the invention illustrated in the drawings, the tank 1 is made of sheet iron and is about 6 ft. deep 5 ft. 4 in. long, and 3 ft. wide. The location of the tank in the building in which it is used is such that its upper edge is on a level with the floor. The tank is provided with an inclined floor 2 near its top which extends from one end downward about two-thirds of the way toward the other end. This inclined floor is provided with a number of holes 3 to permit the liquid in the tank to rise through the floor and flow over the same. At the end of the inclined floor a grille 4 is located which is supported upon the angle-iron 5, located at the lower edge of the inclined floor, and the angle-iron 6, secured to the opposite end wall of the tank. The grille 4 is preferably made in an integral casting which has a series of bars 7 extending across from side to side of the grille, the grille or floor thus constituting a support having two sets of openings therein for permitting a circulation of the liquid in opposite directions through the sets of openings respectively, as will be explained. Underneath the grille is arranged a hopper 8,

made of sheet metal, secured at its edges to the walls of the tank and the angle bar 5. The hopper is in the shape of an inverted, truncated, rectangular pyramid. In the center of the lower and smaller base of the hopper, there is provided a pipe 9 which is secured to the flat bottom of the hopper and which extends downward therefrom well toward the bottom of the tank. This hopper and pipe constitute means for holding the solution when first produced in an undiluted and concentrated condition whereby it will fall through the conduit afforded by the pipe into the bottom of the tank and displace the water (or less highly concentrated solution) therein which is of a less specific gravity.

In using this dissolving tank, in making solutions of caustic soda, for example, the calces of caustic soda are slid down the inclined floor on to the grille 4. The proper weight of soda is laid on the grille to produce a solution of the desired strength and then water is admitted to the tank until it rises to, say, the level indicated in Fig. 2. The proper amount of water and caustic soda having been put in the tank the dissolving process begins and continues automatically until it is completed. The water dissolves the soda and forms a solution which, being of greater specific gravity than the fresh water, falls into the hopper, passes down through the pipe 9, which maintains the concentration of the solution, and is discharged into the bottom of the tank. The lowermost portion of the fresh water is thus displaced and is forced upward. This causes a new supply of fresh water to pass through the holes in the floor 2 and into contact with the soda on the grille where the dissolving operation is continued. This operation continues until the soda is entirely dissolved and the resultant solution is then of substantially uniform strength throughout the tank owing to the circulation which is induced by the use of the hopper and pipe.

In ordinary practice it would be convenient to put the soda on the grille, run in the water and leave the tank until the next morning, when the soda will be found to have been completely dissolved and to have formed a solution of uniform strength.

By providing the apparatus with a valve 10 in the conduit leading from the place where the solution is formed, the rate of flow of the solution away from the support

may be regulated. This regulates indirectly the flow of the liquid to the substance to be dissolved and thereby determines the strength of the solution to be formed. It also adapts the apparatus for use with different substances (as where one substance is more rapidly soluble than another), and for making solutions of different strengths.

The present invention is not limited to the illustrated embodiment thereof, as it may be embodied in other and different forms depending for their operation upon the physical fact that a solution of a substance in any liquid is always of greater specific gravity than that liquid, and having provision by which the solution when formed is segregated from the main body of the liquid and conducted to a place where it will displace the dissolving liquid and move it toward the place where the substance is.

An important feature of the illustrated embodiment of the invention resides in this,—that by providing the tank with the grille and inclined floor, it is impossible for a workman to fall into the tank. The worst that can happen will be that he will step into it. Again, owing to the fact that the caustic soda may be placed on the grille before the water is admitted the spattering of a dangerous liquid is avoided. The automatic operation of the tank avoids the necessity for breaking up the calces of caustic soda which has heretofore been the common practice. This procedure is objectionable because it results in injury to the workmen by the flying of chips of caustic soda which sometimes endanger, if they do not destroy, the eyesight of the workmen.

Having thus described the invention, what is claimed is:—

1. A dissolving tank having, in combination, a tank proper, a support for the substance to be dissolved having openings therein, said support being located near but below the normal level of the solvent in the tank, and an inclined floor, with openings, extending from the support to the side of the tank at a point above the normal level of the solvent, substantially as described.

2. A dissolving tank having, in combina-

tion, a tank proper, provided with a support for the substance to be dissolved located near the normal level of the liquid adapted to be contained therein, said support covering the entire area of the tank and provided with openings for the upward flow of liquid and the downward flow of solution, substantially as described.

3. A dissolving apparatus having, in combination, a container for the liquid, a support in said container for the substance to be dissolved, a conduit receiving the solution produced at the support and discharging it at a distance therefrom, and means for regulating the opening in the conduit, substantially as described.

4. A dissolving tank having, in combination, a tank proper, a hopper near the top of the tank having means for supporting the substance to be dissolved and having a conduit extending to a point near the bottom of the tank, and a floor across the top of the tank sloping downwardly to the hopper and having holes for the upward flow of liquid through the floor whereby a continuous circulation of liquid is maintained upwardly through said holes, over the substance to be dissolved and downwardly through the conduit to the bottom of the tank, substantially as described.

5. A dissolving tank having, in combination, a tank proper, a support in the upper part of the tank for holding the substance to be dissolved, a conduit leading from the support to a point near the bottom of the tank for conducting the solution produced at the support to the bottom of the tank, a floor covering the upper part of the tank which is not occupied by the support, and means for leading liquid from the upper part of the tank to the support whereby a continuous circulation of liquid over the substance to be dissolved and down through the conduit is maintained.

In testimony whereof I affix my signature, in presence of two witnesses.

WALTER E. LUMMUS.

Witnesses:

HORACE VAN EVEREN,
ALICE ACKROYD.