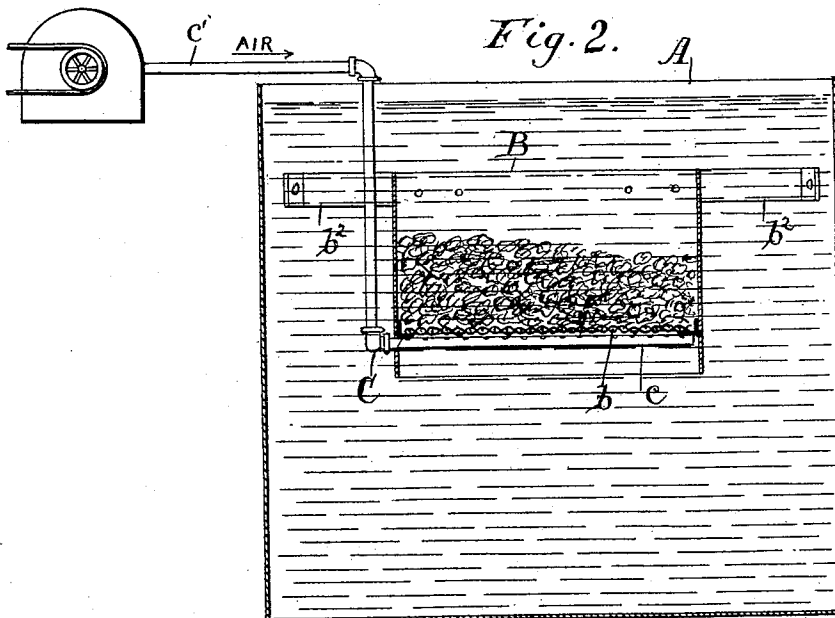
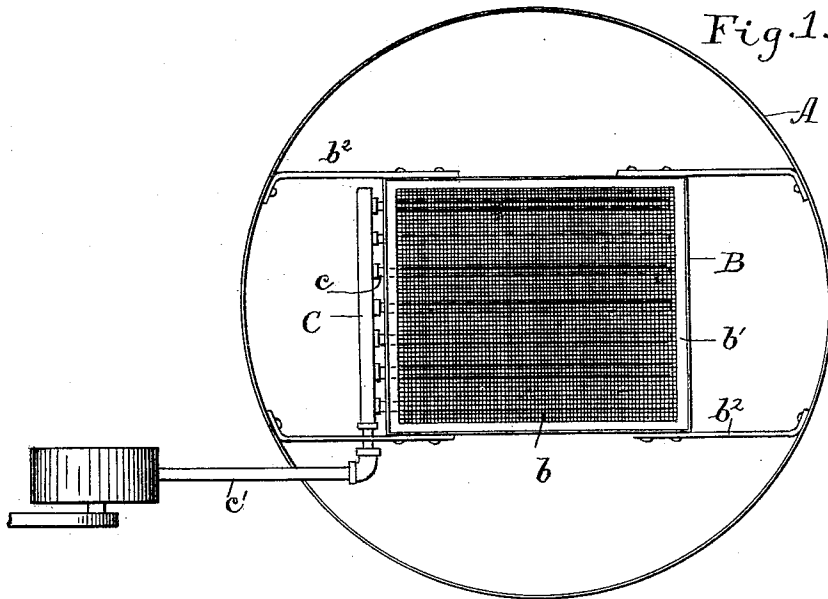


E. F. PARKER.
CAUSTICIZING TANK.
APPLICATION FILED JUNE 12, 1908.

941,036.

Patented Nov. 23, 1909.



Witnesses:
Benj. E. Ward
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UNITED STATES PATENT OFFICE.

EDWARD F. PARKER, OF FAIRFIELD, MAINE.

CAUSTICIZING-TANK.

941,036.

Specification of Letters Patent.

Patented Nov. 23, 1909.

Application filed June 12, 1908. Serial No. 438,072.

To all whom it may concern:

Be it known that I, EDWARD F. PARKER, of Fairfield, in the county of Somerset and State of Maine, have invented certain new and useful Improvements in Causticizing-Tanks, of which the following is a specification.

My invention relates to improvements in solution tanks such as are used to causticize the soda solution in the process of making chemical pulp.

In this process the soda solution is introduced into a large tank and unslaked lime is then put in and mixed thoroughly with the soda solution for the purpose of converting the carbonate of soda into caustic soda.

Hitherto it has been customary to introduce the lime into the tank and assist the operation by means of a mechanical stirrer but this has been found unsatisfactory because the stirrer would not thoroughly break up the numerous lumps which occurred in the lime and it would not prevent the lime from settling in the bottom of the tank in the form of hard masses difficult to remove.

The object of my invention is to hasten the process of causticizing the soda by thoroughly breaking up the lumps or masses in the lime so that the solvent will have access to all parts of it and to keep the solution in motion so that sediment or lime mud which settles at the bottom of the tank will not harden but will be loose and easily removed, all this being done without the use of mechanically operated parts.

I accomplish this object by the use of my invention which consists essentially of a reservoir or cage located within the solution tank and having a pervious bottom with air pipes beneath said bottom which produce a violent ebullition of the liquid, break up the lumps and rapidly disintegrate the mass of lime.

I illustrate my invention by means of the accompanying drawing in which is shown an apparatus constructed according to my invention.

In the drawing, Figure 1 is a plan of a solution tank fitted with my improvement, and Fig. 2 is a central vertical section.

A represents the ordinary metal solution tank such as is used in pulp mills for causticizing soda solution previous to its intro-

duction into the digester. Within the body of the tank A and preferably in the upper portion thereof, I suspend the lime reservoir or cage B by means of suitable brackets *b*² or other supports.

The reservoir B is large enough to hold the desired quantity of lime for the capacity of the tank and it has a pervious bottom *b* preferably of wire netting removably resting on a ledge *b*¹.

Beneath the bottom *b* is located means for forcing air up through the lime, here shown as a series of perforated pipes *c* connecting with a header C, the header being in turn connected with an air supply pipe *c*¹. The pipe *c*¹ is connected with an air compressor, ejector or other suitable means of supplying air under pressure as *e*.

As here shown, the impervious sides of the reservoir extend down below the wire netting bottom and inclose the pipes to form a chamber to prevent the escape of air. As a result of this construction, the air is forced to go up through the mass of lime and cannot go around the outside.

In using the apparatus, the lime is dumped into the reservoir after the tank has been filled with the soda solution and the air is then turned on. The fine columns of air passing up through the perforated bottom and through the body of the lime produce a violent ebullition of the water causing the lumps to quickly break up into fine particles which settle down through the wire screen and quickly and thoroughly mix with the soda solution to produce the chemical reaction. Steam is at the same time forced into the lower portion of the tank through pipes not shown and the heating of the solution aids the process of causticizing the soda.

The sediment or lime mud which settles at the bottom of the tank takes the form of a loose precipitate which is easily removed and it does not settle into hard masses as when a mechanical stirrer is used.

If an injector is used for supplying air, the air will be heated and may be accompanied by a proportion of steam which will act to heat the solution thus assisting the action of regular steam heating pipes.

Instead of using compressed air from a compressor or its equivalent, the upper portion of the tank may be inclosed and a

vacuum produced and air drawn through the pipes with the same effect as above stated when air under pressure is used.

My apparatus may be used for other purposes than those above specified and it is applicable to dissolving soluble salts or other substances in large quantities.

I claim;

1. An apparatus for causticizing soda and other like solutions comprising a solution tank, an auxiliary reservoir in said tank, a perforate bottom for said reservoir, fluid introducing means directly beneath said bottom, and a depending flange forming a liquid seal for preventing the down-flow of said fluid.

2. An apparatus for causticizing soda and other like solutions comprising a solution tank, an auxiliary reservoir in said tank, a pervious diaphragm located between the top and bottom of said reservoir, and fluid introducing means disposed within the lower chamber formed by said diaphragm.

3. An apparatus for causticizing soda and other like solutions comprising a solution tank, an auxiliary reservoir in said tank, a perforate bottom for said reservoir, a flange on said reservoir and concentric therewith,

said flange extending below said bottom, and fluid introducing means within the chamber formed by said flange.

4. An apparatus for causticizing soda and other like solutions comprising a solution tank, an auxiliary reservoir in said tank and having its walls spaced from the walls of said solution tank, a perforated diaphragm above the bottom of said reservoir, a plurality of spray pipes for the introduction of a fluid arranged directly beneath and contiguous to the diaphragm, the walls of said reservoir extending below and surrounding said spray pipes.

5. An apparatus for causticizing soda and other like solutions comprising a solution tank, an auxiliary reservoir in said tank, a removable pervious bottom for said reservoir, fluid introducing means directly beneath said bottom, and a depending flange forming a liquid seal for preventing downward flow of said fluid.

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

EDWARD F. PARKER.

Witnesses:

E. C. HERRING,
F. S. ROWE.