No. 617,367. Patented Jan. 10, 1899.

E. SOLVAY.

APPARATUS FOR DRYING SODIUM BICARBONATE.

(Application filed Apr. 17, 1896.)

(No Model.)

Fig. 1.

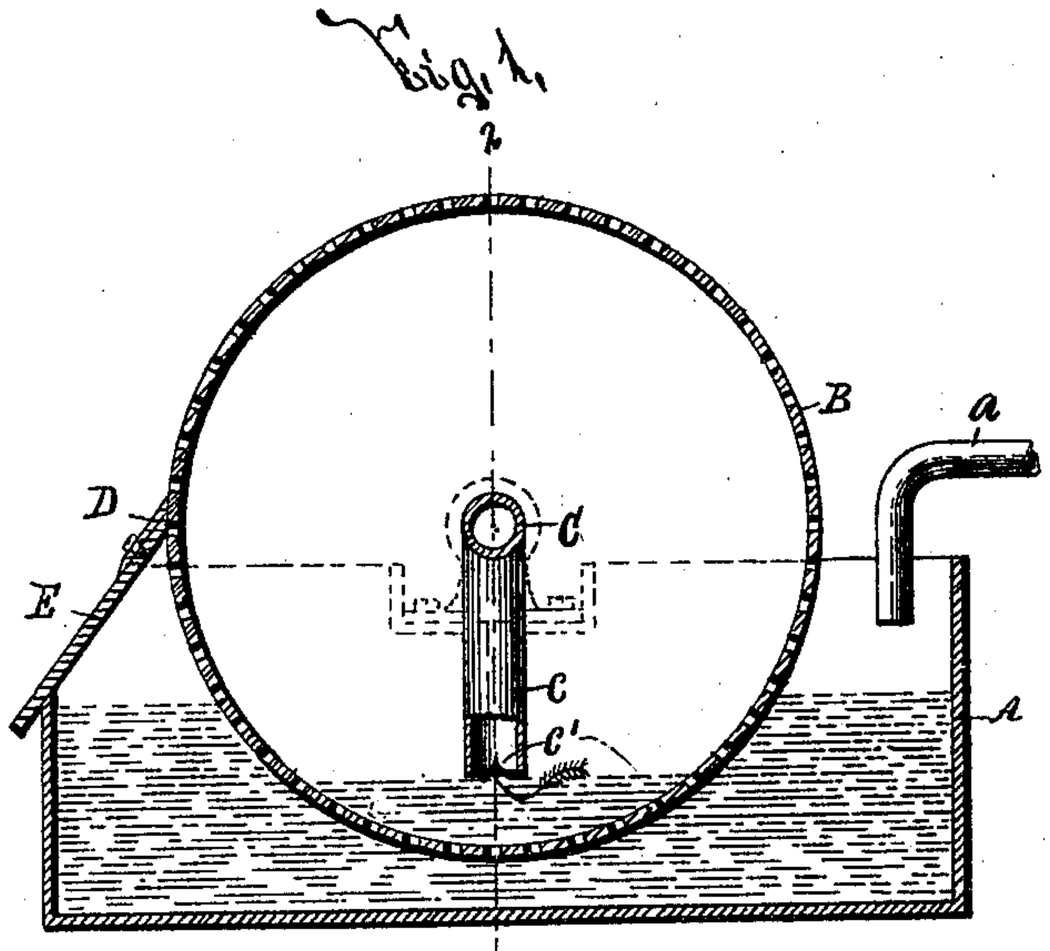
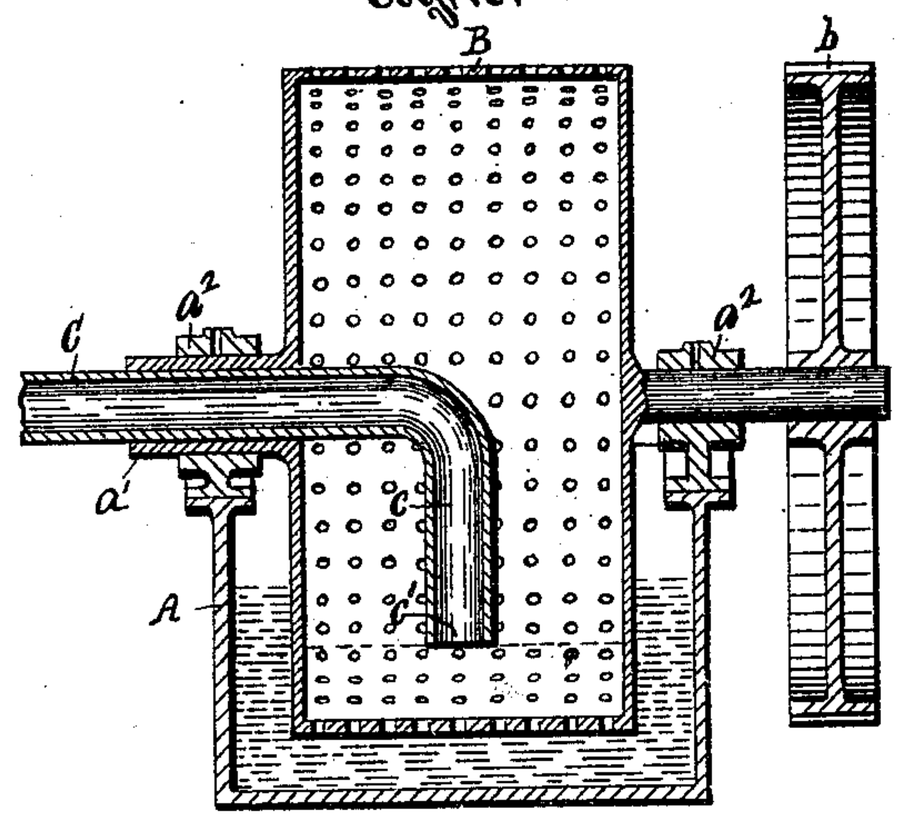


Fig. 2.



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ERNEST SOLVAY, OF BRUSSELS, BELGIUM, ASSIGNOR TO THE SOLVAY PROCESS COMPANY, OF SYRACUSE, NEW YORK.

APPARATUS FOR DRYING SODIUM BICARBONATE.

SPECIFICATION forming part of Letters Patent No. 617,367, dated January 10, 1899.

Application filed April 17, 1896. Serial No. 587,993. (No model.)

To all whom it may concern:

Be it known that I, ERNEST SOLVAY, of Brussels, Belgium, have invented new and useful Improvements in Drying Apparatus, (for which I have obtained Letters Patent of Belgium, No. 110,563, of June 20, 1894; France, No. 240,550, of August 4, 1894, and Great Britain, No. 14,985, of August 4, 1894,) of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in drying apparatus particularly applicable for use in the manufacture of bicarbonate of soda, and has for its object the production of a device for practically and effectively drying material suspended in a liquid or moistened thereby; and it consists in the combination, construction, and arrangement of the component parts of a drying apparatus, as hereinafter fully described, and pointed out in the claim.

In describing this invention reference is had to the accompanying drawings, forming part of this specification, in which like letters indicate corresponding parts in both views.

Figure 1 is a transverse vertical section of my improved apparatus, the perforations in the peripheral wall of the filtering-body being shown as enlarged. Fig. 2 is a longitudinal vertical section taken on line 2 2, Fig. 1.

Bicarbonate of soda during its manufacture is suspended in a liquid from which it is more or less slowly separated with considerable difficulty and expense. My improved drying apparatus is especially designed to rapidly, continuously, and economically effect the desired separation of bicarbonate of soda or any other material from a mother-liquor, but may obviously be used for drying material moistened with a liquid.

A is a receptacle of any desirable form, size, and construction, and *a* is a pipe or conduit for discharging thereinto the material to be dried, which material is usually held in suspension by a suitable liquid, although it may be merely moistened thereby. The pipe *a* may, however, be dispensed with and the material to be dried otherwise discharged within the receptacle A.

B is a filtering-body having a portion of its surface movable into and out of the fluent or moist material in the receptacle A, and C is any suitable means for subjecting one side of said surface to a pressure different from that on the opposite side thereof. The body B may be of any desirable form, size, and construction and preferably consists of a revoluble cylinder actuated by suitable driving means, as a gear *b*, and provided with a perforated peripheral wall, forming its filtering-surface, and closed end walls having projecting trunnions a' a', journaled in bearings a^2 a^2. The means C may also be of any desirable form, size, and construction and is preferably so constructed as to subject the interior of the filtering-body B to a less pressure than its exterior. Said means is here illustrated as consisting of a passage or conduit C, extending through one of the trunnions a' into the body B and formed with a downturned end *c*, having its inlet c' arranged beneath the level of the material in the receptacle A. The opposite or outer end of the pipe or conduit C is connected to a suitable pump, (not shown,) which operates to withdraw a given amount, by weight, of the liquid or moisture and the air or other drying fluid from the interior of the filtering-body B at a greater speed than a similar amount thereof feeds into said filtering-body through the perforations in its peripheral wall. A partial vacuum is thus maintained within the filtering-body B, and in the practical operation of my invention the outer ends of the perforations in the peripheral wall of said filtering-body become more or less filled or clogged with the bicarbonate of soda or other material to be filtered, thus facilitating the maintenance of said partial vacuum.

Owing to the lower pressure within the partially-submerged body B the liquid or moisture within the receptacle A is forced through the filtering-surface of the revoluble body B and escapes through the passage or conduit C, and the material to be dried, being unable to pass through said filtering-surface, accumulates on its outer face to a considerable thickness, where, owing to the difference in the pressure on the opposite sides of said surface, it is firmly maintained, even when lifted out of the main body of the fluent or moist

material as the filtering-surface is revolved. The lower pressure on the interior of the body B also causes the liquid inclosed between the particles of the material on the surface of the body B to be forced through said surface into the interior of said body and thence into the passage or conduit C and compels the air or other drying fluid surrounding the unsubmerged portion of said body to pass through the filtering-surface thereof and into the passage or conduit C, and in its passage said air or drying fluid dries the material accumulated on said filtering-surface. During said operation the lower pressure on the interior of the body B also maintains the material in position upon the filtering-surface thereof, whence it may be removed by any suitable means, as a stationary knife D, having its cutting edge normally separated slightly from the periphery of the body B for forming a glaze of the dried and filtered material upon said periphery, which glaze facilitates the maintenance of a partial vacuum within the body B. The knife D is here shown as mounted on a support E, which usually inclines downwardly for permitting the downward feeding of the material removed by said knife.

The operation of my improved drying apparatus will be readily perceived upon reference to the foregoing description and the accompanying drawings, and it will be particularly noted that I do not herein limit myself to the exact construction and arrangement of any of the component parts thereof, as the same may be materially varied without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A drying apparatus comprising a receptacle for receiving the fluent or moist material to be dried, a revoluble filtering-body having its peripheral wall perforated for forming a filtering-surface, said filtering-body being partially submerged in the fluent or moist material and partially surrounded by air or other drying fluid, a pipe or conduit opening from the interior of the filtering-body for maintaining a partial vacuum within the filtering-body and retaining the material in position on the exterior face of the peripheral wall of said body, and a knife extending crosswise of the periphery of the filtering-body in proximity thereto for removing the greater portion of the dried and filtered material, said knife having its cutting edge normally separated slightly from the periphery of the filtering-body for forming a glaze of the dried and filtered material upon said periphery, substantially as and for the purpose specified.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Brussels, Belgium, this 26th day of February, 1896.

ERNEST SOLVAY.

Witnesses:
K. CUCION,
GREGORY PHELAN.