

(No Model.)

E. D. MELLEN.

APPARATUS FOR MAKING SOAP AND CARBONIC ACID.

No. 422,141.

Patented Feb. 25, 1890.

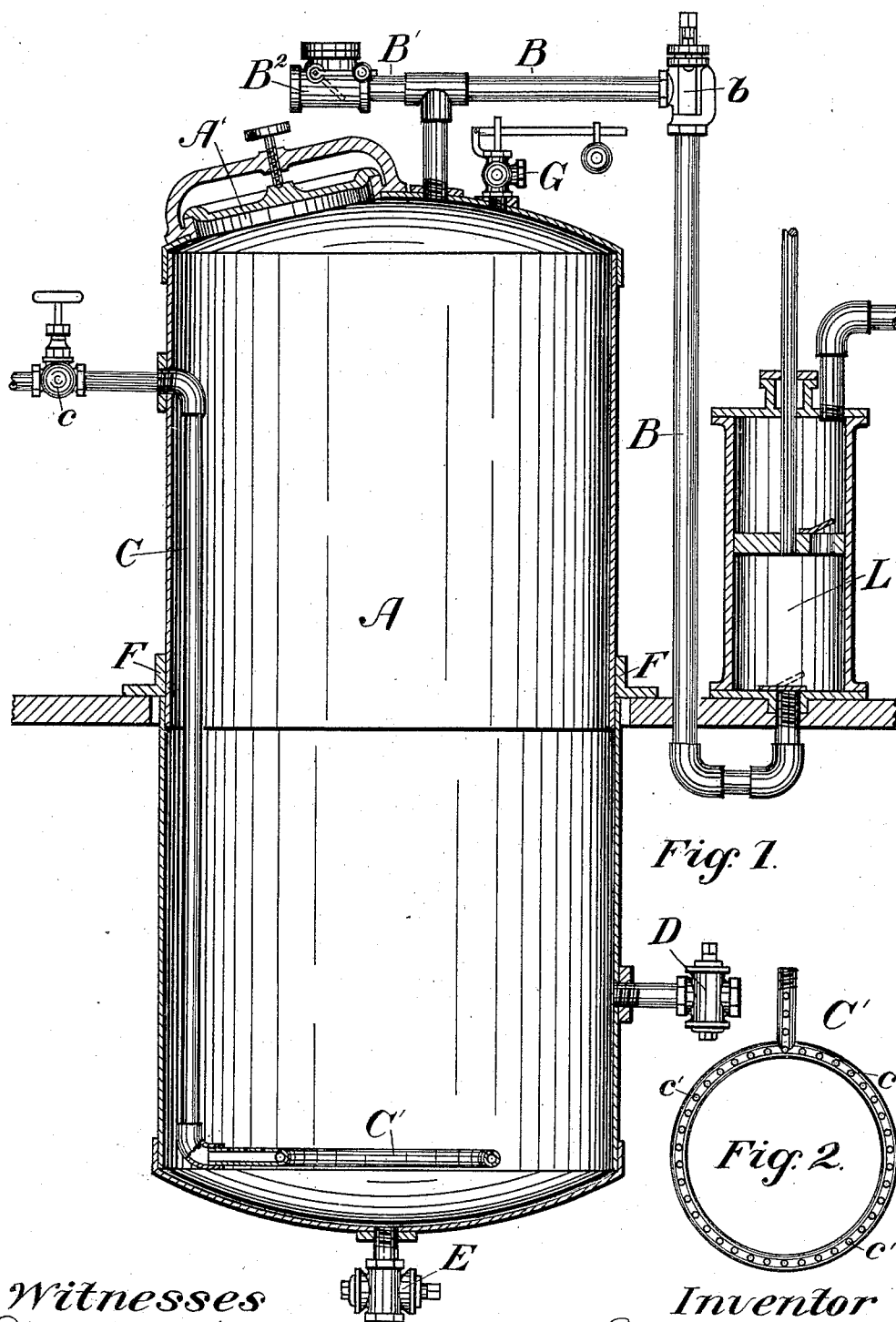


Fig. 1.

Fig. 2.

*Witnesses*  
Albert E. Leach -  
M. H. Thompson.

*Inventor*  
Edwin D. Mellen  
W. B. Andrews atty.

# UNITED STATES PATENT OFFICE.

EDWIN D. MELLEN, OF CAMBRIDGE, MASSACHUSETTS.

## APPARATUS FOR MAKING SOAP AND CARBONIC ACID.

SPECIFICATION forming part of Letters Patent No. 422,141, dated February 25, 1890.

Application filed September 20, 1889. Serial No. 324,545. (No model.)

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

Be it known that I, EDWIN D. MELLEN, a citizen of the United States, residing at Cambridge, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and Improved Apparatus for Making Soap from Sodium Bicarbonate with the Design of Utilizing the Carbonic Acid thus Formed, of which the following is a full specification, reference being made to the accompanying drawings, forming a part thereof.

Figure 1 is a sectional elevation of my apparatus, and Fig. 2 is a plan view of the distributing steam pipe or rose.

My invention consists of the apparatus hereinafter described, which I term a "digester," for making soap from bicarbonate of sodium and at the same time utilizing the carbonic acid thus formed, either for the carbonation of soap-lyes or for any other purpose.

A is the body of the digester, consisting of a cylindrical tank or reservoir, made preferably of boiler-iron in the manner represented, and supported in any desired manner, as by the angle-iron supports F, secured to the digester near the middle of the same. At the top of the tank is the opening A', which serves as a man-hole, whereby access may be had to the interior, and also as a means of introducing the various materials into the digester.

C is a steam-pipe provided with the valve c, which preferably enters the digester near the top of the same, passing down the side thereof, and terminating at the bottom in the distributing pipe or rose C', preferably of circular form, as shown in Fig. 2. This rose is provided with a number of perforations c', being constructed in such a manner as to distribute fine jets or sprays of steam through the mixture within the digester.

D is an outlet-faucet for drawing off the soap, communicating with the interior of the digester at some distance from the bottom thereof, and E is the outlet-tap at the bottom for drawing off the lye.

B is the gas-pipe connected to the top of the apparatus, through which the carbonic acid generated is removed, being provided with a valve b, B' being a branch pipe termi-

nating in the balanced regulating-valve B<sup>2</sup>, opening inward.

G is a safety-valve, of any desired construction, situated on the top or dome of the apparatus.

For the manufacture of soap from bicarbonate of soda or any alkaline bicarbonate, rosin, free fatty acids, or any organic acids capable of forming a soap, may be used. I prefer to use rosin, and proceed in the following manner: The bicarbonate of soda or other alkaline bicarbonate is introduced into the digester just described, either in solution in water or as a solid and water added. The rosin is then introduced and the mixture is gently warmed by allowing the steam to spray through it. The steam as it circulates through the mixture causes the rosin to act upon the bicarbonate of sodium, setting free carbonic acid, a rosin-soap being left in solution. The soap is then salted out from this solution when the action is complete, or the solution may be mixed with a water solution of a common soap, if preferable, the soap being drawn off from the digester through the faucet D. The carbonic acid formed by the action accumulates in the upper part of the digester, and is removed therefrom as fast as formed by means of a suitable pump or blower L, of any approved construction, connected with the pipe B, and the gas is thus conveyed to wherever it is desired to use it.

I preferably use this apparatus in connection with my improved process for the recovery of alkali and glycerine in soap-lye, for which I have applied for United States Letters Patent, the serial number of which application is 324,544, in which the gas is pumped into a tower, as therein described, and used for the saturation of soap-lyes therein contained.

Owing to the tendency to a continual vacuum maintained within the digester by the action of the pump or blower L, the chemical action would naturally become so strong, were it not for the balanced regulating-valve B<sup>2</sup>, as to cause violent frothing of the liquid in the digester, resulting in the pumping out of a part of the liquid, together with the gas. In order to prevent this frothing from taking

place, the balanced valve B<sup>2</sup>, which opens inward, is adjusted to open by reason of the difference in pressure and let in at times just enough atmospheric air from the outside to prevent the air within from becoming so attenuated as to produce the frothing action, as above explained, thus acting as an automatic regulator.

While I have shown the valve as attached to a branch of the gas-pipe B, I do not limit myself to this position, as the valve may be directly secured to the top of the digester, if desired. The safety-valve G acts in the usual manner to allow the gas to escape should the pressure within the digester become too great.

I do not limit myself, moreover, to the exact construction of steam-spraying device herein shown.

I claim—

1. An apparatus for the simultaneous man-

ufacture of soap and carbonic acid, consisting of the combination of a pump or blower with a digester provided with a steam-spraying device, and a balanced air-pressure-regulating valve, whereby the frothing of the liquid is prevented within the digester, substantially as and for the purposes described.

2. A digester consisting of a closed cylindrical reservoir A, provided with the steam-spraying device C C', safety-valve G, and balanced air-pressure-regulating valve B, arranged and operating substantially as and for the purposes described.

In witness whereof I have hereunto set my hand.

EDWIN D. MELLEN.

Witnesses:

W. B. H. DOWSE,  
ALBERT E. LEACH.