

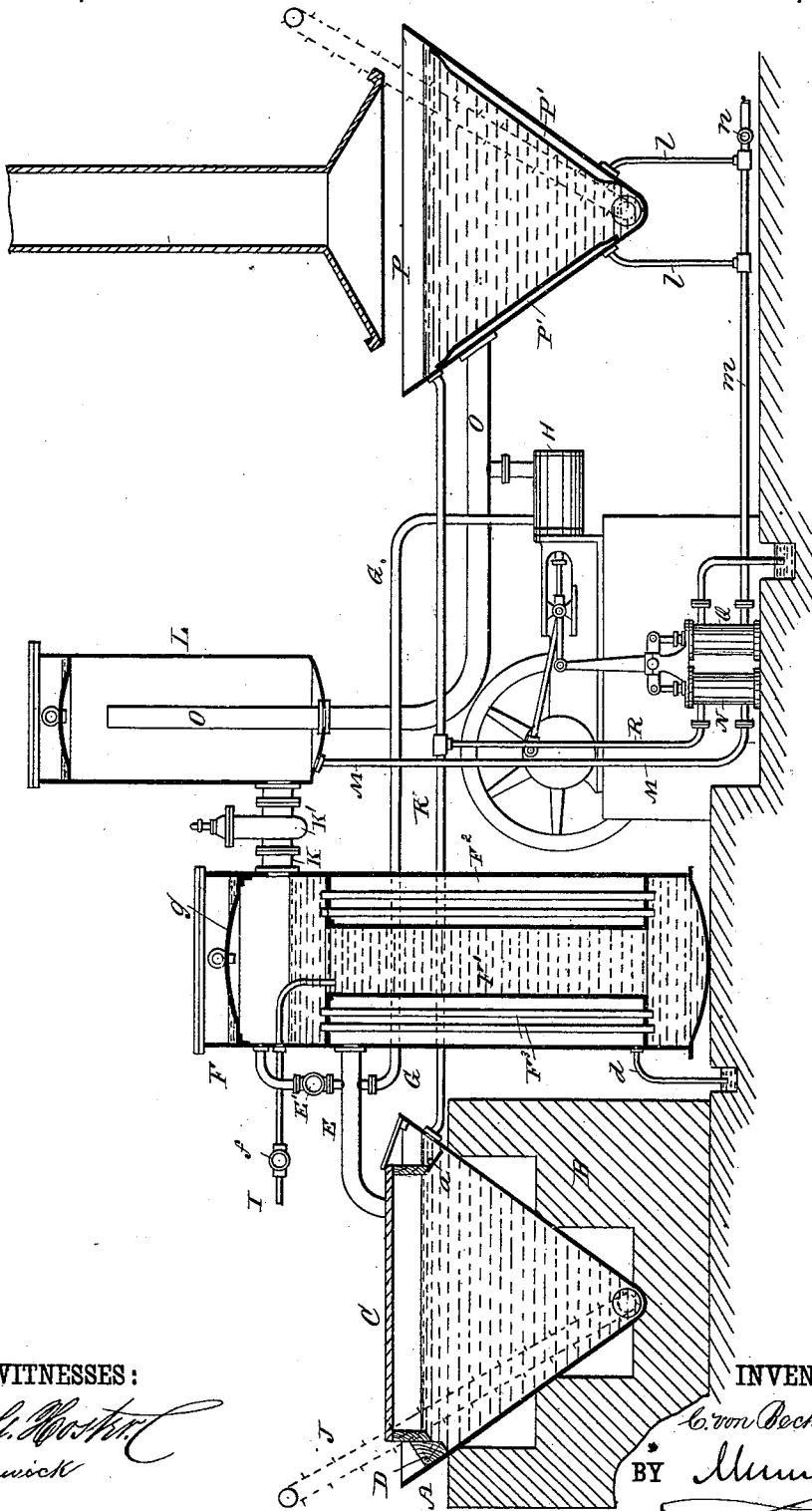
(No Model.)

C. VON BECHTOLSHEIM.

APPARATUS FOR MAKING SALT.

No. 269,355.

Patented Dec. 19, 1882.



WITNESSES:

Phil. G. Weston
L. Sedgwick

INVENTOR:

C. von Bechtolsheim

BY

Mum & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

CLEMENS VON BECHTOLSHEIM, OF MUNICH, GERMANY.

APPARATUS FOR MAKING SALT.

SPECIFICATION forming part of Letters Patent No. 269,355, dated December 19, 1882.

Application filed October 4, 1882. (No model.)

To all whom it may concern:

Be it known that I, CLEMENS VON BECHTOLSHEIM, of Munich, in the Empire of Germany, have invented new and useful Improvements in Apparatus for Making Salt, of which the following is a specification.

The object of my invention is to provide a new and improved apparatus for concentration of brine and deriving the salt from the same.

The invention consists in the combination, with a brine-boiler, of a device for receiving brine from the boiler and two evaporating-pans, one of which pans is connected with the boiler and a pumping-engine in such a manner that the steam from the pan, which is heated by direct flames, can be used to heat the brine in the boiler and to work the pumping-engine. From the boiler the brine passes into the dome, and is then pumped into the two pans. The steam from the dome is used to heat one of the pans.

The invention also consists in parts of construction and combinations of the same, as will be fully described and set forth hereinafter.

Reference is to be had to the accompanying drawing, forming part of this specification, in which a longitudinal sectional elevation of my improved brine-concentrating apparatus is shown.

An evaporating-pan, A, which has a V-shaped cross-section, is placed into and over a furnace, B, of some suitable construction, so that the pan can be thoroughly heated. The pan is provided with a cover, C, made of wood, provided with side pieces which dip into the brine, and with an inner metal covering; or it can be made wholly of metal. Wedge-strips D are placed between the downwardly-projecting side pieces of the cover and the inner surface of the pan to prevent any steam from escaping through the joint of the cover C and the pan; or, if desired, gate-strips *a* can be hinged to the lower edges of the side pieces of the cover, the free edges of the said gate-strips resting against the inner surfaces of the pan, as shown; or any other suitable packing devices may be used to prevent the escape of steam. By means of a conveyer or some other suitable device in the bottom of the pan the salt is carried to one end of the pan, and is carried out of the same by means of an elevator

or bucket chain-pump, J. A steam-pipe, E, leads from the top of the pan A to the boiler F, and a branch pipe, G, of the pipe E leads to the steam-engine H. The pipe E is provided with a cock, E'. The boiler is provided with a large central brine-tube, F', which is surrounded by a cylindrical steam space or jacket, F², through which a series of vertical tubes, F³, pass, in which brine can circulate. The condensation-water is carried off through a pipe, *d*. The brine is conducted into the boiler F by means of a pipe, I, provided with a cock, *f*. The boiler is closed by means of a removable cover, *g*, which is closed by means of a water-seal. A tube, K, provided with a gate, K', connects the upper part of the boiler F with a dome, L, which is provided with an outlet-pipe, M, for the brine, which pipe M leads to a pump, N. A steam-pipe, O, extends through the dome L from near the top of the same to the steam-jacket P' of an evaporating-pan, P, which can be flat or can have a V-shaped cross-section. The condensation-water and air in the steam-jackets P' are withdrawn from the same through the pipes *m* and *l* by a pump, Q, which, with the pump N, is operated by the engine H.

The condensation-water can be used to heat the brine before the same is admitted into the boiler F. The pipe *m* is provided with a cock, *n*. A pipe, R, leads from the pump N to the pans A and P. The exhaust-steam from the engine H passes into the pipe O.

The operation is as follows: The brine is admitted into the boiler F through the pipe I, and is heated in the boiler by the steam, which enters the same from the pan A through the pipe E, which steam circulates around the tubes F' and F³. The heated brine flows through the tube K into the dome L, in which some of the water is converted into steam, which passes through the pipe O into the jackets P' of the pan P. The temperature of said steam is about 75° centigrade, (167° Fahrenheit.) The brine is drawn from the dome L by means of the pump N, and is forced through the pipe R into the pans A and P, in which it is thoroughly concentrated and evaporated to such an extent that the salt-crystals can be separated from the same. If the boiler F is to be cleaned the valve K' is closed, the boiler is emptied, the normal atmospheric pressure is restored in the

same, the cover *g* is removed, and the tubes *F'* *F*³ are thoroughly cleaned. The cover is then replaced, and the boiler is again filled with brine, and the valve *K'* is opened to establish
 5 communication between the boiler *F* and the dome *L*. The apparatus can be started immediately, as none of the vacuum has been destroyed. To produce a vacuum before starting the apparatus the cocks *f* and *n* are opened.
 10 The steam then passes from the pan *A* to the boiler *F*, the dome *L*, the steam-jackets *P'*, and escapes at the cock *n*. The steam heats all the parts through which it passes, and if the cocks *f* and *n* are closed the condensation of the
 15 steam in the above-described parts produces the desired vacuum.

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

- 20 1. In an apparatus for concentrating brine, the combination, with the brine-boiler *F*, of the dome *L* and the evaporating-pans *A* and *P*, substantially as herein shown and described, and for the purpose set forth.
- 25 2. In an apparatus for concentrating brine, the combination, with the brine-boiler *F*, of the dome *L*, the evaporating-pans *A* and *P*, and the pump *N*, substantially as herein shown and described, and for the purpose set forth.
- 30 3. In an apparatus for concentrating brine, the combination, with the brine-boiler *F*, of the evaporating-pan *P*, provided with steam-jackets *P'*, the dome *L*, and the steam-pipe *O*, extending from the dome *L* to the jackets *P'*,
 35 substantially as herein shown and described, and for the purpose set forth.

4. In an apparatus for concentrating brine, the combination, with the brine-boiler *F*, of the dome *L*, the evaporating-pans *A* and *P*, the

pump *N*, the pipe *M*, leading from the dome *L* 40 to the pump, and the pipe *R*, leading from the pump to the pans *A* and *P*, substantially as herein shown and described, and for the purpose set forth.

5. In an apparatus for concentrating brine, 45 the combination, with the brine-boiler *F*, of the evaporating-pans *A* and *P*, the dome *L*, the steam-pipe *O*, the pipes *M* and *R*, the pumps *N* and *Q*, and the pipes *m* and *l*, substantially as herein shown and described, and for the pur- 50 pose set forth.

6. In an apparatus for concentrating brine, the combination, with the brine-boiler *F*, of the evaporating-pan *A* and the steam-pipe *E*, lead- 55 ing from the pan to the boiler, substantially as herein shown and described, and for the purpose set forth.

7. The combination, with a *V*-shaped evaporating-pan, of a cover having side pieces dipping into the brine, and of packing-strips be- 60 tween the side pieces of the cover and the sides of the pan, substantially as herein shown and described, and for the purpose set forth.

8. In an apparatus for concentrating brine, 65 the combination, with the brine-boiler *F*, of the evaporating-pan *A*, the steam-pipe *E*, leading from the pan to the boiler, and the steam-pipe *G*, leading to the pumping-engine *H*, substantially as herein shown and described, and for the purpose set forth. 70

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CLEMENS VON BECHTOLSHEIM.

Witnesses:

AUG. M. SCHWAIGER,
 FO. THINBACH.