

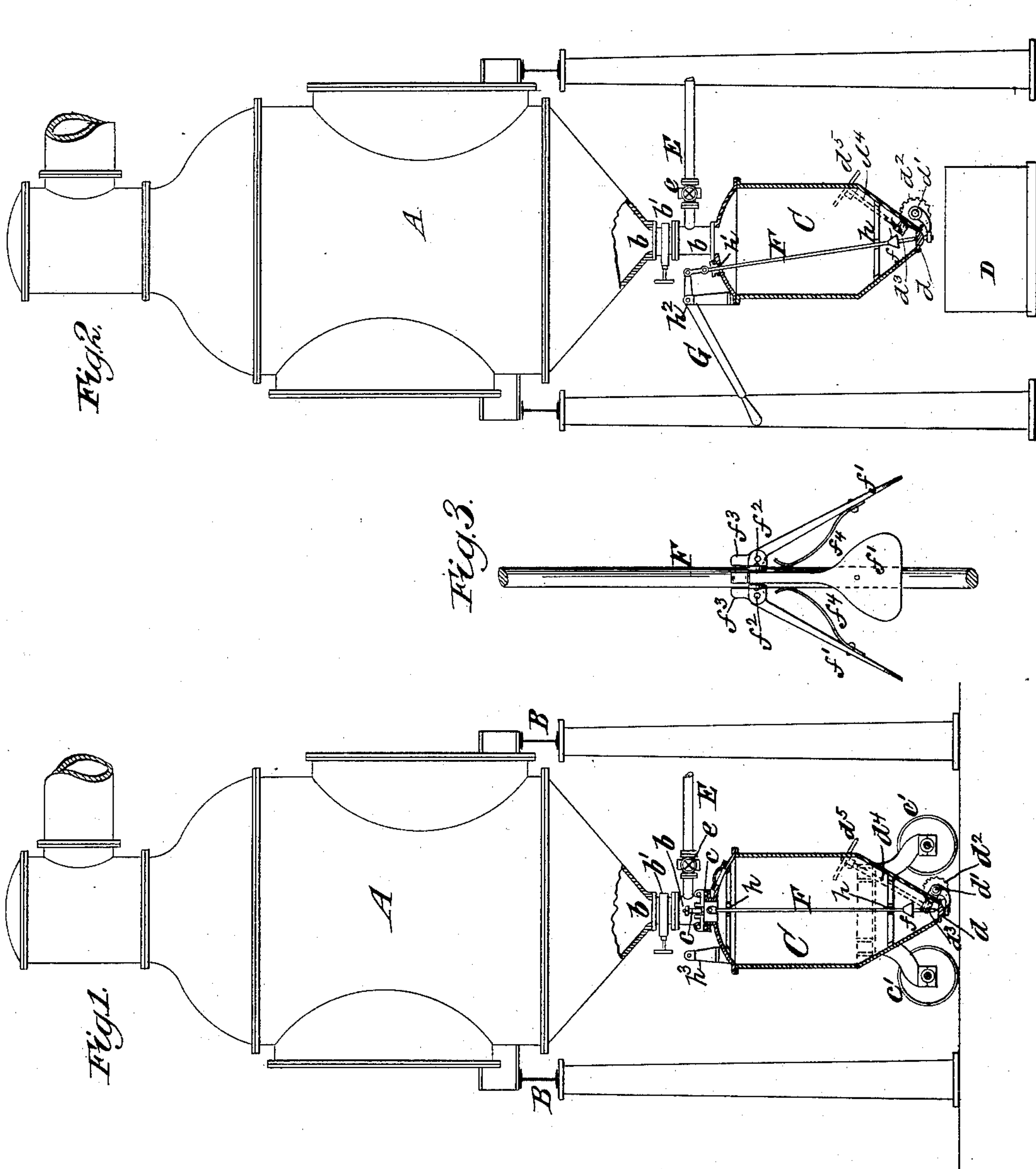
(No Model.)

A. MILLER.

## DISCHARGING APPARATUS FOR CLOSED EVAPORATING PANS.

No. 375,946.

Patented Jan. 3, 1888.



Witnesses.  
 Emily Hector.  
 O. Sundgren.

Inventor:  
Alexander Heiler  
by his attys  
Brown & Hall



# UNITED STATES PATENT OFFICE.

ALEXANDER MILLER, OF NEW YORK, N. Y.

## DISCHARGING APPARATUS FOR CLOSED EVAPORATING-PANS.

SPECIFICATION forming part of Letters Patent No 375,946, dated January 3, 1888.

Application filed March 4, 1887. Serial No. 229,684. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER MILLER, of New York, in the county of New York and State of New York, have invented a new and useful Improvement in Discharging Apparatus for Closed Evaporating-Pans, of which the following is a specification.

My invention may be employed in discharging closed evaporating-pans in which a partial vacuum or a pressure reduced below that of the atmosphere is maintained during the operation; but the invention is more particularly intended for discharging the solid precipitant from pans in which during the operation a pressure above that of the atmosphere is maintained, and which are employed for the production of salt and other solid precipitants which will not be injured by boiling under a pressure greater than that of the atmosphere.

In carrying out my invention the closed evaporating pan has at the bottom an outlet provided with a valve, and with which is detachably connected a discharge-chamber provided with a valve at its lower end, and a pipe communicates with the outlet below the valve for the supply of brine or other such liquor as is evaporated in the pan to the discharge chamber. Before discharging the solid precipitant from the pan enough liquor is admitted to entirely fill the discharge-chamber, and then when the valve in the pan-outlet is opened a change of liquor from the discharge-chamber to the pan and of solid precipitant from the pan to the discharge-chamber takes place by the action of gravity and without any material variation in the volume of the contents of the evaporating-pan. The discharge-chamber, being detachably connected with the outlet, may be mounted upon truck-wheels to provide for its ready removal from a position below the pan after it has received solid precipitant from the pan, the pipe for the inflow of liquor in such case being connected with the outlet below the valve and above the point of connection of the chamber with the outlet. There may be in some cases and in working some materials a tendency of the solid precipitant, which is in a moist state, to arch over the outlet of the discharge-chamber when the valve is opened and to remain in the chamber, and to avoid this I

provide a rod and plunger, which may be reciprocated by a lever within the discharge-chamber in order to loosen the precipitant and insure its free discharge from said chamber. When the said rod and plunger are used to loosen the salt or precipitant, the discharge-chamber may be permanently connected with the outlet, if desired, as opportunity is then afforded for loosening and removing the salt, even though said chamber is closed externally at the top by its connection with the outlet.

The invention consists in novel combinations of parts, which are hereinabove referred to and hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of a closed evaporating-pan and a sectional elevation of a discharging apparatus embodying my invention and detachably connected with the valved outlet of the pan. Fig. 2 is a similar elevation of the pan and discharging apparatus, showing the discharge-chamber as permanently connected with the valved outlet of the pan; and Fig. 3 is an elevation, on a larger scale, of a portion of the rod which is arranged to be reciprocated within the chamber in order to induce a free flow of the solid precipitant from the chamber.

Similar letters of reference designate corresponding parts in the several figures.

A designates a closed evaporating-pan mounted upon suitable supports, B, and having a bottom of inverted conical form provided with an outlet, *b*, controlled by a gate or valve, *b'*.

C designates a discharge-chamber, which may be of cast metal or of other construction, and which at its upper end is connected with the valved outlet *b*. As shown in Fig. 1, the chamber C is detachably connected with the valved outlet *b* by swing-bolts *c*, and whenever desired these bolts may be loosened and swung upward, the valve *b* having been previously closed, and the discharge-chamber C may then be moved laterally from beneath the pan to any desired locality where it is to discharge its contents, the chamber C being provided with wheels *c'* to enable it to be readily moved. As shown in Fig. 2, the discharge-chamber C is a fixture with the pan A, and is securely bolted to the valved outlet *b*. In both exam-



ples of my invention the discharge-chamber C has at its bottom a valved outlet, and has its bottom preferably of inverted conical form, in order to facilitate the flow of solid precipitant from it. In both examples of my invention the outlet from the discharge-chamber C is controlled by a swing-valve,  $d$ , pivoted at  $d'$ , and having secured upon its pivot a worm-wheel,  $d^2$ , and with which engages a worm,  $d^3$ , upon a spindle,  $d^4$ , said spindle being provided with a hand-wheel,  $d^5$ , whereby it may be turned in order to open or close the valve  $d$ .

In the example of the invention shown in Fig. 2 the discharge-chamber C may deliver its solid precipitant directly into a box, D. I have represented a pipe, E, provided with a valve,  $e$ , as connected with the outlet  $b$  of the pan below its valve  $b'$ , and through this pipe E the discharge-chamber C may be filled with brine or other liquor—such as is under evaporation in the pan—preparatory to discharging solid precipitant from the pan into said chamber C.

In operating with either example of my invention shown the discharge-chamber C is first filled with brine or other liquor and the valve  $b'$  is then opened. The action of gravity on the solid precipitant in the lower portion of the pan A then causes a transfer of solid precipitant from the pan to the discharge-chamber C and a corresponding transfer of brine or other liquor from the discharge-chamber upward into the pan A, and in this way any quantity of solid precipitant equal to or less than the volume of the discharge-chamber C may be delivered from the pan A into the discharge-chamber without materially altering the level of liquor in the pan or causing any material change in the conditions of operation. After the valve  $b'$  is closed the discharge-chamber shown in Fig. 1 may be removed from the pan to the place of discharge; or in operating with the example of my invention shown in Fig. 2 the valve  $d$  may be immediately opened and the precipitant discharged from the chamber C. The precipitant, being moist, may have a tendency to pack in the discharge-chamber and arch over the discharge-opening therefrom, and in order to prevent such interruption in the discharge from the chamber C, I have represented a rod, F, which may be reciprocated within the chamber C, and which carries a plunger or other enlargement adapted to scrape away or dislodge the

precipitant from the chamber C when the valve  $d$ , which controls the outlet therefrom, is opened. The rod F may have upon it a conical hood or scraper,  $f$ , which may be formed in one structure, as shown in Figs. 1 and 2, or which may consist of blades or sections  $f'$ , pivoted at  $f^2$  upon the rod F, and having upward toes or projections  $f^3$ , which limit their outward movement from the rod F, as shown in Fig. 2, springs  $f^4$  being employed to force the sections outward.

In the example of my invention shown in Fig. 2 the rod F is fitted to a guide,  $h$ , in the chamber C, and projects through a stuffing-box,  $h'$ , and a lever, G, fulcrumed at  $h^2$ , may be employed for reciprocating the rod in the chamber to dislodge the precipitant at its outlet. In the example of my invention shown in Fig. 1 the rod F is vertical and fitted to an upper guide,  $h$ , and the lever which is employed to operate it in a manner similar to Fig. 2 is detached from its fulcrum-support  $h^3$ , while the discharge-chamber C is connected with the pan.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a closed evaporating-pan having a valved outlet, of a movable discharge-chamber detachably connected with the outlet below the valve, and a pipe for the inflow of liquor connected with the outlet below the valve and above the point of connection of the chamber with the outlet, substantially as herein described.

2. The combination, with the pan A, having the outlet  $b$ , provided with a valve,  $b'$ , of the discharge-chamber C, detachably connected with the outlet, and itself provided with an outlet-valve,  $d$ , and a pipe, E, for filling the chamber with liquor, communicating with the outlet below the valve, substantially as herein described.

3. The combination, with a closed evaporating-pan having a valved outlet and a discharge-chamber connected with said outlet and provided with a discharge-valve, of a rod and plunger working upward and downward in said chamber for loosening the precipitant and to prevent clogging of the outlet from the chamber, substantially as herein described.

ALEX. MILLER.

Witnesses:

C. HALL,  
FREDK. HAYNES.