

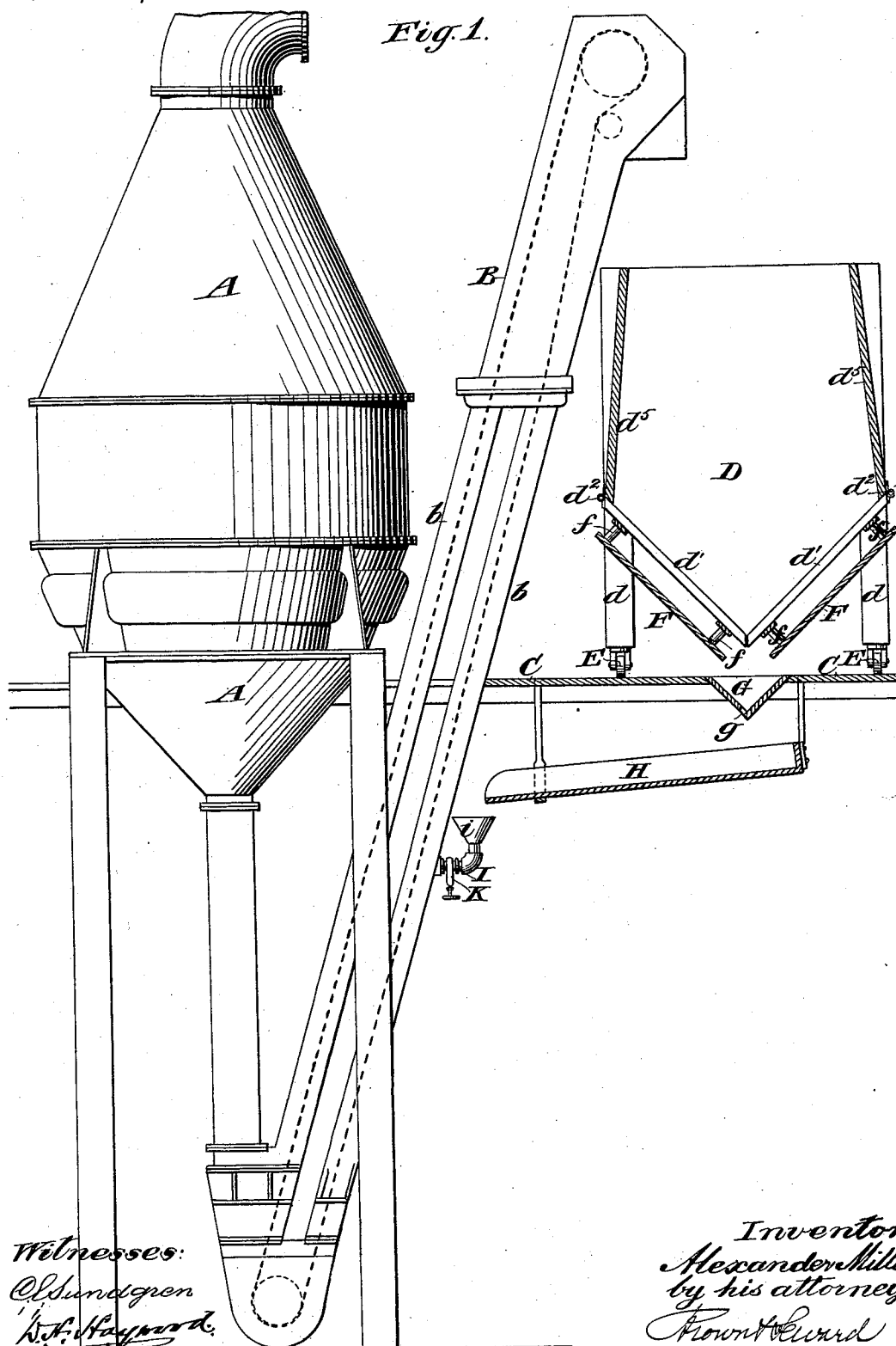
(No Model.)

3 Sheets—Sheet 1.

A. MILLER.
EVAPORATING APPARATUS.

No. 466,570.

Patented Jan. 5, 1892.



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Fig. 2.

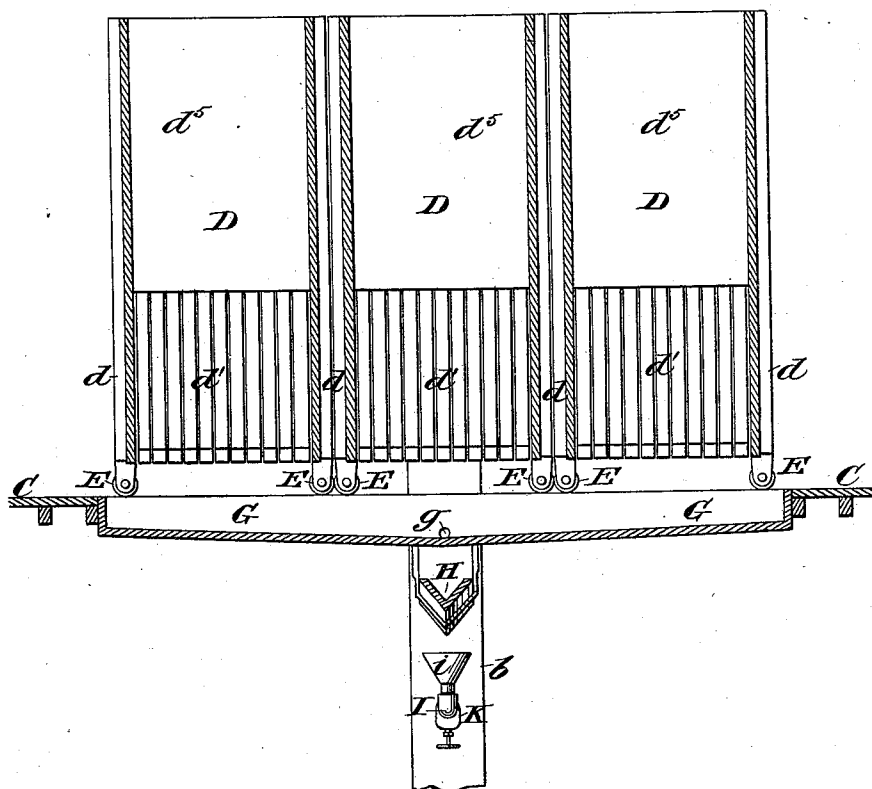
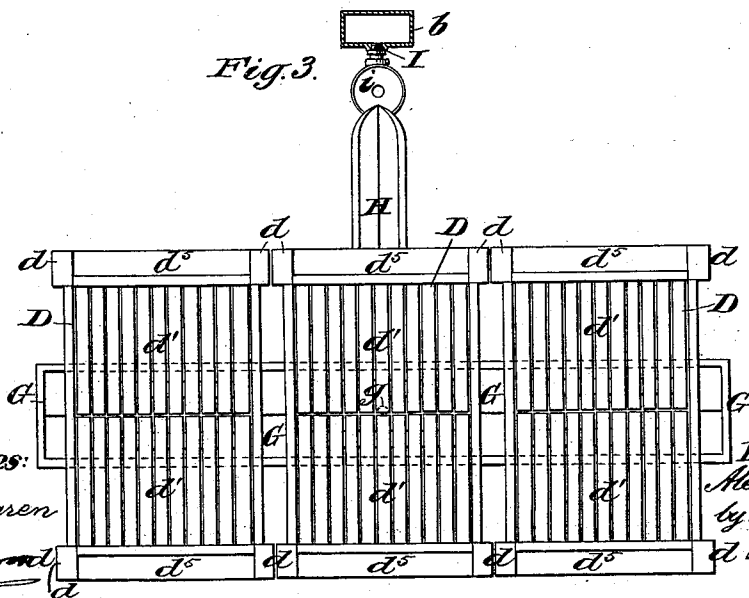


Fig. 3.



Witnesses:

Olundgren

H. H. H. H.

Inventor:
Alexander Miller
by his attorneys
R. M. & S. J. S.

(No Model.)

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Fig. 4.

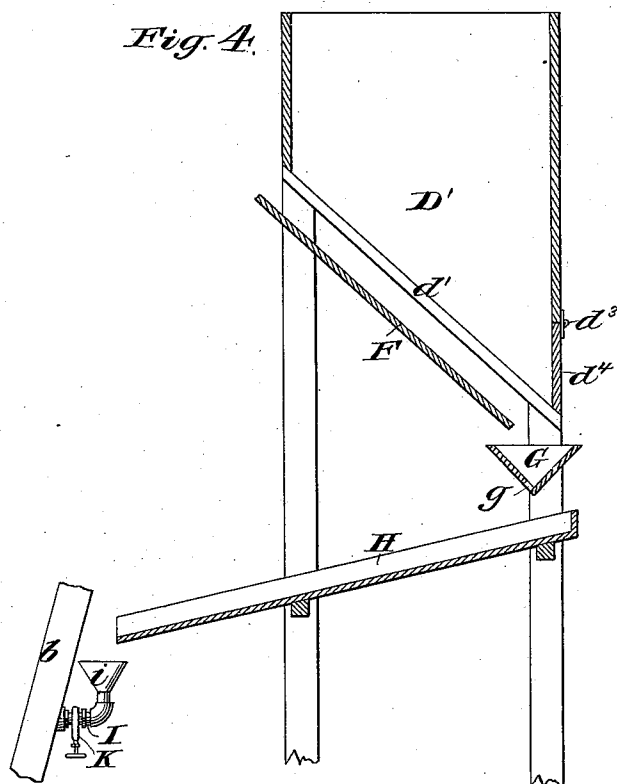
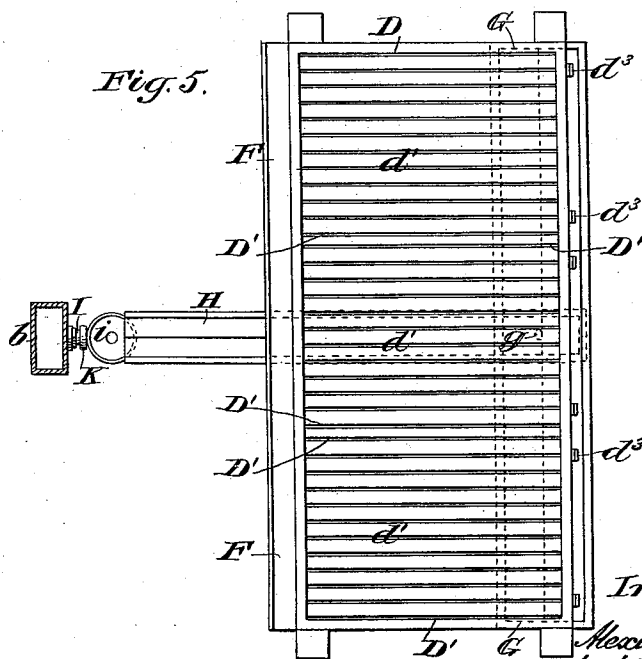


Fig. 5.



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Inventor:
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UNITED STATES PATENT OFFICE.

ALEXANDER MILLER, OF NEW YORK, N. Y., ASSIGNOR TO BROWN & MILLER, OF JERSEY CITY, NEW JERSEY.

EVAPORATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 466,570, dated January 5, 1892.

Application filed September 19, 1890. Serial No. 365,466. (No model.)

To all whom it may concern:

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

My invention relates to an improvement in evaporating apparatus, and more particularly to that part of a salt-evaporating apparatus which receives the salt in a wet or damp state from the elevator leading from the evaporating-pan, the object being to form a simple and effective apparatus for draining the liquid from the salt delivered into the receiver and returning the liquid to the evaporating-pan.

A further object is to provide for the ready removal of the drained salt to a suitable storage-bin.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents a vertical section of the draining and liquid-returning apparatus in connection with a vacuum-pan and elevator, the pan and elevator being shown in side elevation. Fig. 2 is a vertical section from side to side through the draining-tanks, looking toward the elevator. Fig. 3 is a top plan view of the draining apparatus, showing a portion of the elevator-leg in horizontal section. Fig. 4 is a vertical section from front to rear through a draining apparatus in which the draining-tanks are represented as stationary, showing a portion of the elevator-boot and funnel-receiver in side elevation; and Fig. 5 represents a top plan view of the form of apparatus shown in Fig. 4, the elevator-leg being shown in horizontal section.

A represents a vacuum-pan provided with a discharge-conduit B, communicating with the lower end thereof and extending obliquely upwardly at one side thereof, the said conduit being formed in two legs *b* for the reception of the upwardly and downwardly moving parts of an endless elevator, here represented in dotted lines. The vacuum-pan and elevator herein shown are of the same general structure

as fully shown and described in my application, Serial No. 280,499, now Patent No. 428,281, of May 20, 1890, in which the surface of the column of liquid in the legs of the elevator-conduit is held below the surface of the liquid in the vacuum-pan because of the partial vacuum formed in said pan above the surface of the liquid therein. At a convenient distance below the upper end of the elevator, where the salt carried up from the bottom of the vacuum-pan is discharged, a platform C is located, which forms a support for one or more drainage-tanks D. In the present instance I have shown three such tanks D arranged side by side, and this number I find convenient in practice.

In the form shown in Fig. 1 the tanks D are supported upon wheels E, suitably journaled in legs *d*, so that one of the series of tanks may be caused to travel along the platform C to a point where it is desired to deposit the load of salt therein contained, while in Figs. 4 and 5 I have shown the series of tanks in the form of stationary sections D'. In both forms—the stationary and the movable—the tanks are provided with bottoms formed by strips *d'*, of wood or other suitable material, placed edge to edge and having a downward slant, as shown. The strips *d'* are intended to be laid in close proximity to each other, but not so near as to form a liquid-tight joint. In the form shown in Fig. 1 the bottom is formed in two sections, preferably of about the same width and hinged at their upper edges to the sides of the tank at *d*², their lower edges meeting about centrally of the tank, the sections being provided with any well-known or suitable fastening for securing them in their closed positions.

In the form shown in Figs. 4 and 5 the bottom extends from one side of the tank to the opposite side and is permanently secured in its position, the lower portion of the side of the tank adjacent to the lower edge of the bottom being hinged to the side, as shown at *d*³, so that the portion *d*⁴ of the side of the tank may be swung outwardly to allow the drained salt to slide out of the tank into a suitable carriage (not shown) for the purpose

of transferring it to a storage-bin. The swinging door d^4 is held in its closed position by any well-known or suitable fastening. Underneath the bottom and spaced therefrom I provide shields F for the purpose of conducting any liquid which may find its way through between the strips d of the bottom along down toward the lower edge of the bottom. In the form of my device shown in Fig. 1 the shields F are secured to the swinging bottom-sections conveniently by posts f , while in the form shown in Figs. 4 and 5 the said shield is permanently fixed in its position. Underneath the lower ends of the bottom and located in a position to receive the liquid from the lower ends of the shields F a trough G is located, the said trough extending along underneath the entire series of tanks and being so inclined as to conduct the liquid that may fall therein toward a single orifice g , formed in the trough. In the present instance I have shown the trough downwardly inclined from its opposite ends toward the middle portion, at which point the discharge-orifice g is located.

In the form shown in Fig. 1 the trough is located with its upper edge flush with the platform on which the tanks travel, while in the form shown in Fig. 4 the said trough may be located above or below the floor, as found convenient. From beneath the discharge-orifice g another trough H leads with a suitable incline to an inlet-pipe I, connected with the leg b , down which the elevator travels. The inlet-pipe I is preferably provided with a funnel-shaped mouth i , located under the discharge end of the trough H, and the said inlet-pipe is further provided with a stop-cock K for the purpose of closing the said inlet-pipe to prevent the escape of liquid therefrom when for any purpose the vacuum in the pan A shall have been removed. When in operation, it is intended that the inlet-pipe I shall remain open.

For the purpose of insuring the ready discharge of the drained salt from the tank D, I prefer to provide the said tank with its side walls d^5 slightly flaring, as they extend downwardly, as clearly shown in Fig. 1.

The operation may be briefly described as follows: The discharge from the top of the elevator-conduit is directed into one of the tanks D or tank-sections D', and when a sufficient load has been accumulated in said tank or tank-section the discharge is then diverted into another of the tanks or tank-sections D or D', and the salt deposited in the first tank is allowed to drain. So, again, when a sufficient load has been accumulated in the second tank-section the discharge is diverted into the third and the salt in the second allowed to drain, and so on. The number of tanks employed will naturally depend upon the time required for draining thoroughly the salt deposited into the first and discharging the salt from that tank, ready to receive a

new load. While the salt is being deposited in the second or third tank, the salt in the tank in which it was first deposited having now become thoroughly drained, the said tank may be wheeled away and its load discharged (or, in case of the stationary tank, its load may be discharged into a suitable carriage) and the tank then returned into position to again receive a load from the elevator. The drainage of the salt deposited in the tanks goes on continuously, the liquid drained therefrom, and, of course, heavily laden with salt, being directed into the troughs G H, and thence into the inlet-pipe I, and thence into the vacuum-pan, thereby saving in this simple manner the entire amount of salt suspended in the liquid which drains from the tank.

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

1. In evaporating apparatus, the combination, with an evaporating-pan and means for discharging the substance treated, of a series of separate drainage-receptacles arranged in position to receive successively the discharged substance, and conduits leading from the drainage-receptacle to a pipe in communication with the evaporating-pan, substantially as specified.

2. In evaporating apparatus, the combination, with an evaporating-pan and a series of independently-movable drainage-receptacles, of a trough located beneath the receptacles to receive the drainage therefrom, and a conduit leading from the trough to the evaporating-pan, substantially as set forth.

3. The combination, with the evaporating-pan and its discharging mechanism, of a drainage-tank free to move into and out of position to receive its load, and means for returning the liquor from the movable drainage-tank to the evaporating-pan, substantially as set forth.

4. In evaporating apparatus, the combination, with a drainage-tank provided with a slanting bottom formed of strips of material placed edge to edge so as to admit of the escape of liquid between them, of a conduit leading from the lower edge of the slanting bottom for conducting the drainage away, substantially as set forth.

5. In evaporating apparatus, the combination, with a drainage-tank provided with a slanting bottom formed of strips of material placed edge to edge so as to admit of the escape of liquid between them, of a shield spaced from the bottom in position to conduct the liquid escaping therefrom toward the lower edge of the bottom, and a conduit for conducting the liquid away from below the lower edge of the shield and bottom, substantially as set forth.

6. In evaporating apparatus, a drainage-tank provided with a slanting bottom formed of two sections hinged at their upper edges to the sides of the tank and adapted to meet at their lower edges, the said bottom sections

being composed of slats spaced apart, and the said tank being further provided with supporting-wheels, substantially as set forth.

to one side to allow the load to drop, substantially set forth.

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Witnesses:

FREDK. HAYNES,
K. E. PEMBLETON.

5 7. In evaporating apparatus, a drainage-tank having its opposite sides set outwardly flaring as they extend downwardly, and its bottom formed slanting and arranged to swing