

O. FALLER.
VALVE.

APPLICATION FILED NOV. 1, 1910.

1,001,130.

Patented Aug. 22, 1911.

Fig. 1.

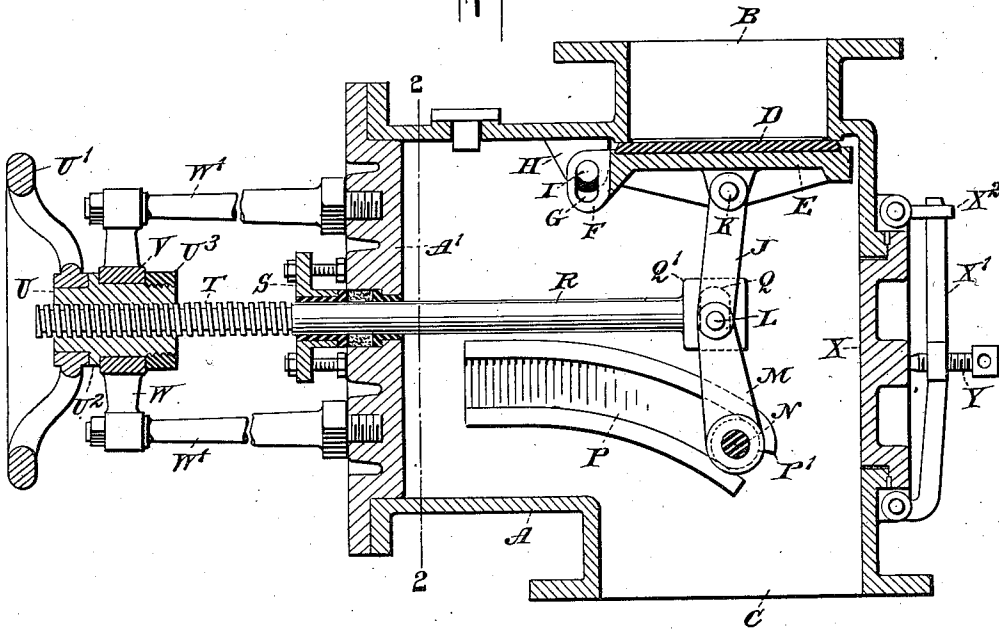
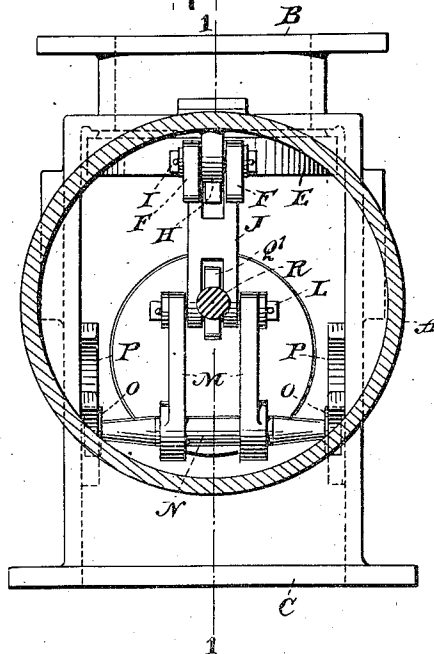


Fig. 2.



WITNESSES:

Louis Alexander

John A. Klenck

INVENTOR

Oscar Faller

BY

Parsons & Knauth
ATTORNEYS

UNITED STATES PATENT OFFICE.

OSCAR FALLER, OF MUNICH, GERMANY.

VALVE.

1,001,130.

Specification of Letters Patent. Patented Aug. 22, 1911.

Application filed November 1, 1910. Serial No. 590,177.

To all whom it may concern:

Be it known that I, OSCAR FALLER, a subject of the German Emperor, and resident of the city of Munich, Germany, have invented certain new and useful Improvements in Valves, of which the following is a specification.

My invention relates to valves and more particularly to valves for controlling outlets located in the bottom of receptacles such as for instance salt evaporators and has for its object to provide a valve construction in which a powerful leverage is secured to close said valve against any resistance such as the weight of the contents of the receptacle.

A further object of my improvement is to construct said valve so that when it is closed it will be firmly locked in position against any accidental dislocation either by the contents of the receptacle or from any other causes.

A still further object of my invention is to make it possible to open said valve to a position where it and its connected parts will be entirely withdrawn from the path of the descending contents of the receptacle so that the passage between the valve chamber inlet and the outlet thereof will be entirely free from any obstructions.

My invention will be fully described hereinafter and the features of novelty will be pointed out in the appended claims.

Reference is to be had to the accompanying drawing in which—

Figure 1 is a longitudinal section of my improved valve taken in the line 1—1 of Fig. 2 and Fig. 2 is a cross section thereof on the line 2—2 of Fig. 1.

In the drawings A represents the valve casing which is provided with an inlet B and an outlet C arranged substantially in vertical axial alinement with each other. The inlet B is intended to be connected with a receptacle of any kind in which the outlet is located at the bottom as for instance a salt evaporator, while the outlet C may communicate with or simply be located over a container for receiving the material. The inlet B is controlled by means of a valve D carried by a valve plate E provided with spaced oppositely arranged lugs F each of which is slotted as indicated at G. A stationary ear H located at a suitable point in the valve casing extends between the lugs F

and carries oppositely extending pins I each of which projects into one of the slots G to serve as pivots about which said valve plate is arranged to swing and to move during the opening or closing operation. A link J is pivotally connected at K with a lug on the lower face of said valve plate and has its opposite forked end pivotally connected by means of a pin L with levers M. These levers M are each secured to an axle N on opposite ends of which rollers O are mounted, which rollers O are arranged to travel in stationary cam guides P located on opposite walls of the valve casing in registry with each other. The link J and levers M together thus form a toggle joint the purpose of which will appear more fully hereinafter. It will be seen that the upper rail of each cam guide P is curved at one end toward the cooperating opposite rail so as to form a stop P' to limit the movement of each roller O in one direction. The guides P are long enough to provide a support for the said rollers throughout the entire extent of their movement in either direction. The pin L in addition to extending through the link J and levers M also projects through a slot Q formed in a block Q' located in the forked end of said link J as clearly shown in Fig. 2. This block Q' is carried by a valve stem R which passes through a suitable stuffing box S on the cover A' of the valve casing and is screw threaded for a portion of its length as indicated at T. The said screw threaded portion T extends through and cooperates with an internally screw threaded hub U of a hand wheel U' which hub is rotatable in a bearing V but held against axial movement therein by means of a flange U² and nut U³ respectively. The bearing V which is stationary is secured to arms W which in turn are carried by standards W' preferably removably mounted on the cover A' of the valve casing A. A door or cover X is located in the wall of the casing A opposite to the cover A' and is maintained in position by a hinged bolt X' which engages a latch X², a jack screw Y serving to maintain said bolt and latch in locking engagement with each other. This door may be removed when access to the interior of the casing is desired for any purpose such as cleaning or repairing.

In operation when it is desired to open the valve D the hand wheel U' is rotated in

a direction to cause the valve stem R to travel to the left in Fig. 1. This lengthwise movement of the said stem is occasioned through the coöperation of the screw threads on said stem R and hub U respectively and to the fact that the said hub, while it is free to rotate is held against axial movement and thus draws the said stem along as the hand wheel U' is rotated.

As the said stem R is moved as just described a pull will be exerted on the link J and the valve disk E and valve D thus swung downwardly about the projections I. At the same time the levers M will be subjected to a pull and thus cause the rollers O to travel upwardly along the guides P. This operation is continued until finally the valve D and plate E have reached a vertical position or in other words depend from the pins I. It will be seen that the valve and valve plate and all of the parts connected therewith have by this operation been withdrawn toward the cover A' and out of the path of the descending material so that the passage between the inlet B and outlet C is left entirely clear and free from obstructions of any nature. The contents of the receptacle with which the valve coöperates or as much of said contents as desired thus freely descends through the outlet into the receiving container. No part of this descending material remains in the valve chamber and cannot become lodged anywhere to clog the valve and furthermore friction is greatly reduced owing to the absence of obstructions as before described. It will be seen that the inlet B is smaller in diameter than the outlet C and in fact than the portion of the casing which forms a passage between said inlet and outlet so that the walls of this portion of the casing are located to each side of the inlet as is clearly shown in Fig. 2. As the guides P are carried by these walls just referred to, the said guides are also located outside of vertical lines drawn downwardly as continuations of the inside surface of the inlet. Thus these guides are also outside of the path of any descending material so that the danger of any of said material lodging on said guides is practically eliminated.

To close the valve the hand wheel U' is rotated in the opposite direction to cause the stem R to move in the opposite direction or toward the right in Fig. 1. This reverse operation will cause a push to be exerted on the link J and therefore gradually swing the valve plate E and valve D toward the inlet, the rollers O meanwhile traveling along the guides P owing to a similar push being exerted on the levers M. This continues until finally the rollers O engage the stops P' by which they are held against further movement, the valve D having meantime almost been returned to its

seat. A continued operation of the hand wheel U' in the same direction now causes the stem R to further advance toward the right in Fig. 1 and as the rollers O are held against any further movement along the guides P this continued movement will tend to straighten out the toggle joint formed by the link J and levers M and thus securely close the valve against its seat. During this last part of the closing operation, that is the straightening out of the toggle joint the rollers act as a fulcrum so that a powerful leverage is secured and the valve easily closed even against any resistance which may exist as for instance the weight of the material remaining in the receptacle and partly in the valve casing. The curved configuration of a portion of the guides P and the slots G and Q permit the necessary movements of the parts during the operation of the valve. After the valve has been closed as above described the toggle joint is held against being broken through the medium of the screw threaded engagement between the valve stem R and hub U of the hand wheel U' so that said valve is securely held and firmly locked against accidental displacement and can be opened only by operating the hand wheel U' as described.

My invention is of particular utility in connection with salt evaporating apparatus, in which the crystallized salt is dropped out of the bottom of the evaporator, or in connection with any other receptacle in which a more or less solid and sometimes moist product is discharged through an opening in the bottom.

Various changes in the specific form shown and described may be made within the scope of the claims without departing from the spirit of my invention.

I claim:

1. The combination of a valve casing having an inlet and an outlet located substantially in vertical alinement, a valve controlling said inlet, a toggle connected with said valve at one end, rollers journaled at the other end of said toggle, cam guides located on opposite walls of said valve casing in which said rollers are adapted to travel and mechanism connected with said toggle at the joint thereof for moving said valve and its connected parts to a point outside of the passage between said inlet and outlet.

2. The combination of a valve casing having an inlet and an outlet located substantially in vertical alinement, a valve controlling said inlet, a toggle connected with said valve, the free end of which toggle forms a movable fulcrum, a support for said fulcrum, a stop for limiting the movement of the fulcrum end of said toggle in one direction and mechanism connected with said toggle for moving said valve to an open position outside of the passage between the in-

let and outlet and for forcing said fulcrum end against said stop to lock the valve in its closed position.

5 3. The combination of a valve casing having an inlet and an outlet located substantially in vertical alinement, a valve controlling said inlet, a movable fulcrum, a connection between said fulcrum and said valve, a support for said fulcrum, a stop for limiting the movement of said fulcrum in one direction and means connected with said connection for moving said valve to an open position outside of the passage between said inlet and outlet, and for forcing said fulcrum against said stop to lock said valve in its closed position.

10 4. The combination of a valve casing having an inlet and an outlet substantially in

alinement, a swinging valve controlling said inlet, mechanism having a member movable linearly for moving said valve to an open position outside of the passage between said inlet and outlet and for closing it, a link pivotally connected with said valve and said member, a lever pivotally connected at one end with said member, and a guide in said casing for guiding the free end of said lever and arranged to form a bearing therefor at the end of movement in one direction.

In testimony whereof, I have hereunto set my hand in the presence of two subscribing witnesses.

OSCAR FALLER.

Witnesses:

JOHN A. KEHLENBECK,
G. V. RASMUSSEN.