

Nov. 13, 1934.

J. F. MUIR

1,980,495

VALVE

Original Filed April 16, 1931

Fig. 1

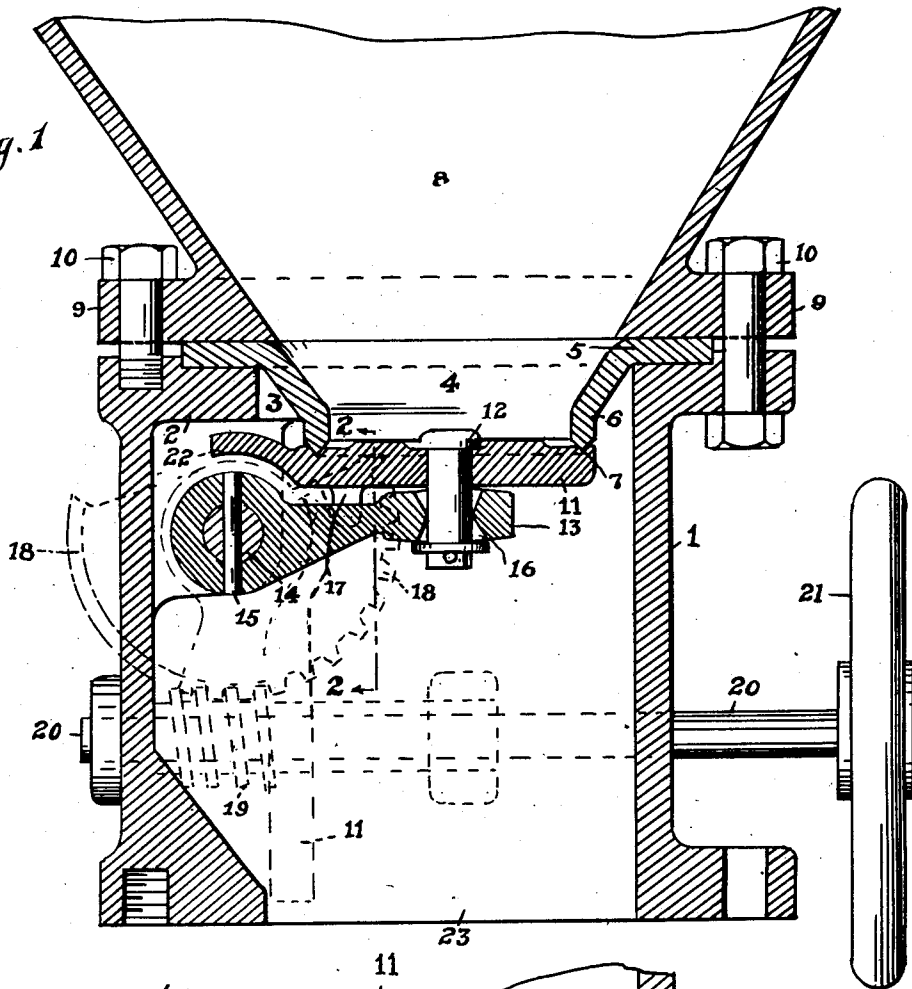
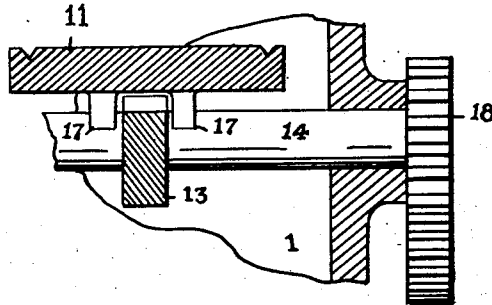


Fig. 2



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UNITED STATES PATENT OFFICE

1,980,495

VALVE

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Renewed April 4, 1934

2 Claims. (Cl. 251—10)

My invention relates in general to a disc type of check valve within a housing.

It is one object of this invention to provide a downwardly tapering frusto-conical valve seat associated with a disc valve pivotally supported on an arm so as to swing in a quadrant between two extreme positions of the valve. Another object is to provide a valve seat of the type described which is merely set in an opening in a casing and readily removable therefrom. Another object is to provide a universal mounting for the valve on its supporting arm so that the valve can adjust itself to its seat. Another object is to provide a knife-edge fitting between the valve and the lower edge of the valve seat. Another object is to so pivot the arm which supports the valve that when the valve swings to its vertical position it will be out of the line of travel of the material dropping through the valve seat. Other objects appear hereinafter.

Referring to the drawing, Fig. 1 is a central vertical section showing one form of my invention, and Fig. 2 is a section on the line 2—2 of Fig. 1, parts having been omitted.

On the drawing, 1 designates a metal casing having in its upper wall 2 the circular opening 3. Resting upon the wall 2 and around the opening 3 is the frusto-conical valve seat 4 having the horizontal flange 5 resting upon the wall 2 while the frusto-conical portion 6 projects downwardly through the opening 3 and terminates in the circular knife-edge 7. The pin 8 has a downwardly tapering interior whose lower end registers with the upper end of the opening in the valve seat 4. The lower end of the bin is seated on the flange 5 which extends somewhat above the upper face of the wall 2. The bin has a horizontal flange 9 through which bolts 10 extend down into the casing to connect the bin to the casing and to clamp the valve seat tightly between the bin and the wall 2.

11 is a circular or disc valve adapted to be seated against the knife-edge 7 and pivoted on the pin 12 supported by the free end of the arm 13 carried by the horizontal shaft 14 mounted in the casing. The arm is secured to the shaft by the cross-pin 15. The hole 16 in the arm 13 is rounded both above and below its central portion in order to allow the valve 11 to have universal movement by which it may seat against the knife-edge around its whole circumference. The valve 11 is prevented from rotation on the pin 12 to any great extent by the pendent lugs 17 carried by the valve 11 and embracing opposite edges of the arm 13. The upper face of the valve 11 may have an

annular depression to fit the annular knife-edge 7 on the bottom of the valve seat 4.

The shaft 14 carries outside of the casing the worm-wheel quadrant 18 which meshes with the worm 19 on the shaft 20 which is operated by the hand-wheel 21 or other suitable means. It will be noted from the dotted lines on Fig. 1 that when the valve is in its lowest position its face is out of the line of contact with the material descending through the valve seat.

The edge of the valve 11 nearest the shaft 14 is provided with the extension 22 which lies over the part of the arm 13 which surrounds the shaft 14 and serves as a guard to prevent material flowing laterally above the shaft when the valve is swung downwardly to the position shown in dotted lines. The escape of material in the space above the shaft 14 might interfere with the opening and closing movements of the valve.

The cross-sectional area of the mouth or delivery end of the valve seat 4 is less than that of the discharge opening 23 at the bottom of the casing or of any discharge pipe which may be connected thereto. In handling pulverized material such as soot or flour or the like, it is necessary to throttle the flow to allow for the flow-retarding friction in the removable or discharge pipe. If the discharge pipe is small or smaller in area than the valve port, the removable or discharge pipe will clog because the valve seat which has a Venturi shape accelerates the flow of the material as it leaves the seat opening. I have therefore found it advantageous to make the discharge opening or passage from the casing have a larger cross-sectional area than that of the discharge opening of the valve seat.

The tapering portion of the valve seat within the opening 3 preferably fits the said opening at its upper end so that the valve seat may be merely dropped with the lower end of the seat in the opening and become automatically centered in the opening. This provides a definite position for the valve seat so that the valve 11 will properly engage the valve seat without any adjustment thereof.

When it is necessary to renew the valve seat it is necessary merely to remove the casing 1, take out the loosely-seated valve seat 6 and drop another seat into its place, the latter seat automatically dropping into the proper position for the accurate seating of the valve 11 against its lower edge. The valve seat 6, unlike those which are attached to the casing by screw-threaded joints, is free to find its proper positions in the

assembly and ensures a secure fitting and attachment of the seat for service.

The valve construction shown may be used for the handling of pulverized or granulated material or liquids of high viscosity or gritty content. I have described the element 8 as a bin, but it represents any storage device or conduit or fitting for containing and transmitting to the valve any material which will flow, such as ashes or any other materials just enumerated.

I claim:

1. In a valve construction, a casing, a downwardly-facing valve-seat at its upper side, a shaft, an arm carried thereby, a valve member carried by the arm for moving the valve member to the seat and away therefrom, and a shield carried by the valve at the edge thereof nearest the shaft

and closing the space between the valve-seat and the valve member at the said edge when the valve is moving from closed to open position.

2. In a valve construction, a casing, a downwardly-facing valve-seat at its upper side, a shaft, an arm carried thereby, a valve member carried by the arm for moving the valve member to the seat and away therefrom, means whereby the valve member is loosely mounted on the arm, a shield carried by the valve at the edge thereof nearest the shaft and closing the space between the valve-seat and the valve member at the said edge when the valve is moving from closed to open position, and means preventing the valve member from rotating on the arm.

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20	95
25	100
30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150