

March 27, 1928.

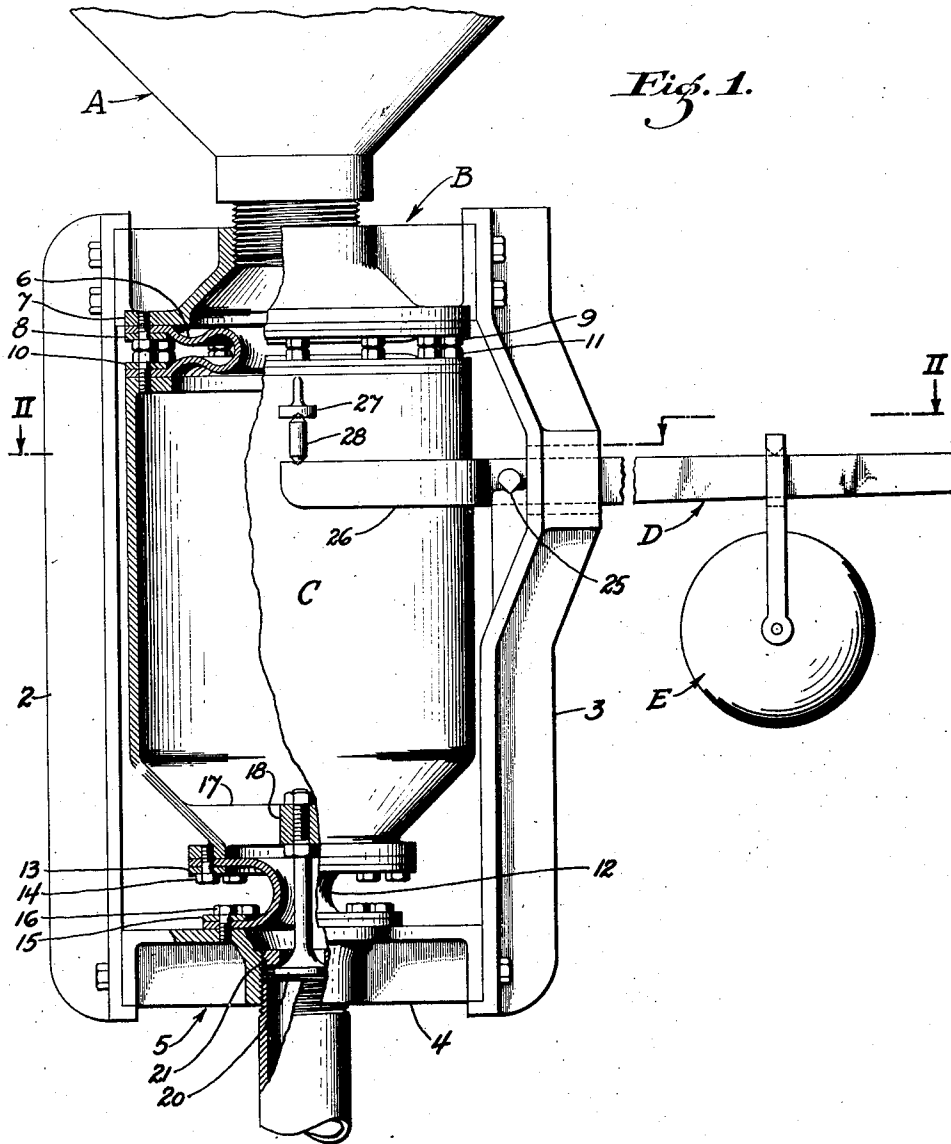
1,664,020

W. A. BRADLEY

AUTOMATIC DISCHARGE VALVE

Filed Sept. 8, 1925

2 Sheets-Sheet 1



INVENTOR.
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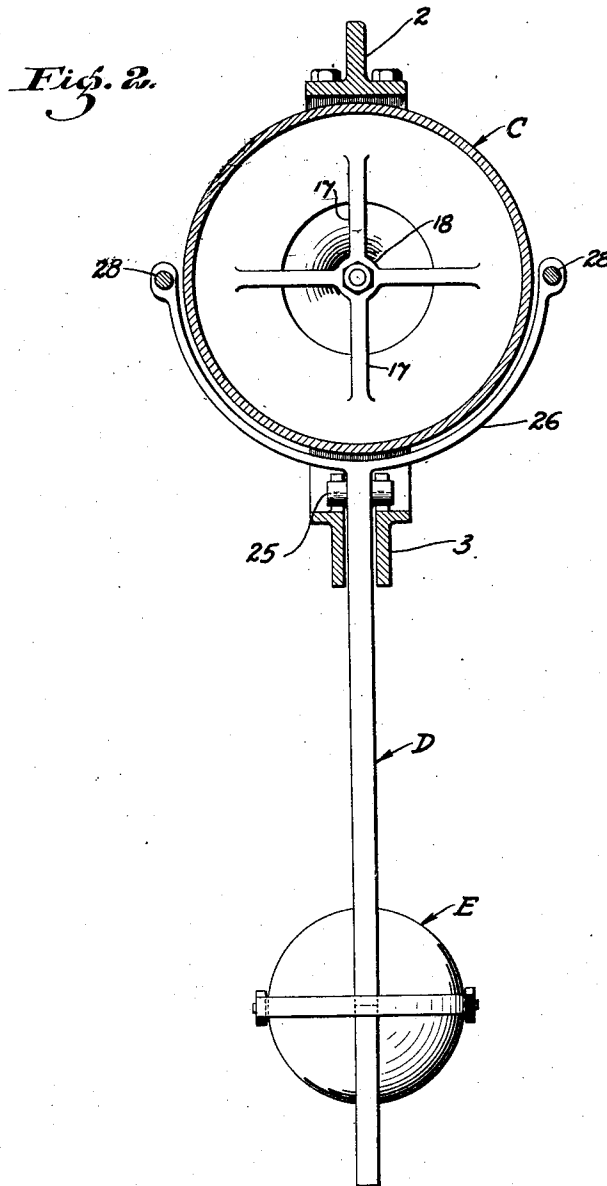
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

WILLIAM A. BRADLEY, DECEASED, LATE OF SAN FRANCISCO, CALIFORNIA, BY IRVIN S. THYLE, ADMINISTRATOR, OF SAN FRANCISCO, CALIFORNIA.

AUTOMATIC DISCHARGE VALVE.

Application filed September 8, 1925. Serial No. 54,892.

This invention relates to valves and particularly to automatic discharge valves to be used on dewatering and decanting machines, thickeners, or any similar machine in which particles in suspension are to be settled and automatically discharged. The present invention is an improvement on a former patent issued to William A. Bradley, March 24, 1925, entitled Automatic discharge valve, Patent No. 1,530,592.

The object of the present invention is to generally improve and simplify the construction and operation of the valve shown in the patent above referred to, to provide a valve which is automatic and sensitive in operation, a valve which is adapted to be attached to the bottom of a tank used in connection with dewatering or like machines, and which will be operable independent of the tank or the contents thereof, a valve which consists of a mechanism which comprises a movable bowl, a valve carried thereby, a stationary valve seat with which the valve cooperates; and further to provide a valve which depends upon the weight of the contents of the bowl for movement and operation.

One form which the invention may assume is exemplified in the following description and illustrated in the accompanying drawings, in which—

Fig. 1 is a side elevation of the lower portion of a settling tank showing the application of the invention, said side elevation being partially in section.

Fig. 2 is a cross section taken on line II—II of Fig. 1.

Referring to the drawings in detail and particularly to Fig. 1, A indicates the bottom portion of a dewatering machine or the like. The bottom portion is provided with a central discharge opening and connected with the bottom of the tank and mounted in alignment therewith is a head member generally indicated at B. Secured to the head member are a pair of downwardly extending arms 2 and 3, and connecting the lower ends of the arms is a cross bar 4 which supports a final discharge member 5. Disposed intermediate of the discharge member 5 and the head B is a floating bowl generally indicated at C. This bowl is cylindrical shaped in cross section and elongated as illustrated. The upper end of the bowl is connected with a head member B through means of a flexible annular diaphragm 6 which may be constructed of rubber or like material. The upper end of the diaphragm is secured to a flange 7 of head B by means of a clamping ring 8 and bolts 9, and the lower side of the diaphragm is secured to the upper end of the bowl by a clamping ring 10 and bolts 11. A water-tight joint is in this manner formed and free movement of the bowl in a vertical direction is at the same time permitted. The lower end of the bowl is similarly connected to the discharge member 5; that is, a flexible annular diaphragm 12 is disposed between the bowl and the discharge member and this diaphragm is secured at its upper end to the bowl by means of a clamping ring 13 and bolts 14, while the lower end of the diaphragm is secured to the cross arm 4 or the discharge member 5 by means of a clamping ring 15 and bolts 16. Secured interior of the bowl or formed integral therewith is a pair of cross arms 17. A hub member 18 is formed centrally of said arms, and a rod extends downwardly through the hub and is secured therein. This rod carries a valve of the mushroom type such as shown at 20 in its lower end, and this valve cooperates with a stationary valve seat member 21 adjustably secured in the discharge member 5. The bowl proper is maintained in a floating condition between the head B and the discharge member 5 and it is supported by an arm generally indicated at D. This arm is supported on a knife pivot indicated at 25 and it is forked as at 26 to straddle the bowl. The opposite sides of the bowl are provided with lugs 27 and pins 28 are interposed between the lugs and the outer ends of the forks, the pins providing an anti-friction support which resists vertical movement of the bowl to the least degree. The arm D is otherwise provided with an adjustable counter-weight E and the valve 20 may thus be normally held against its seat 21 with any predetermined pressure desired. In actual operation, it will be understood that the tank A is filled with a solution which carries solids in suspension; for instance, slime or fine ground material of a pebble mill or the like such as used in mining operations. This material is continuously delivered to the tank A and the solids contained gradually settle to the bottom while the more

or less clear solution is permitted to over flow. The continuous settling of the solids would in time completely fill the tank, and it is therefore necessary to discharge the solids as rapidly as they accumulate. This is automatically taken care of in the present instance by providing the floating bowl and the valve actuated thereby. The solids settling in the tank discharge through the head member B into the bowl, and as they accumulate in the bowl the weight thereof gradually increases to such an extent that the bowl overcomes the action of the counterweight and accordingly settles vertically in a downward direction. The valve accordingly moves away from the seat 21 and the solids are free to continuously or intermittently discharge through the member 5.

The position of the counterweight is normally such that the bowl will remain in a raised position so as to maintain the valve 20 in engagement with its seat. Thus, if no solids are entering the tank, there will be no discharge. But the moment solids begin to enter and accumulate, a slight additional weight will be obtained and this is just sufficient to lower the bowl and the valve and thereby permit an automatic discharge.

The density of the discharging material may be regulated to more or less extent by adjusting the position of the counterweight or by adjusting the position of the valve seat member 21. Actual experience proves that it is possible to obtain a discharge containing as much as 70 per cent or more of solids.

While certain features of the present invention are more or less specifically illustrated, it is to be understood that various changes in form and proportion may be resorted to within the scope of the appended claims. It is similarly to be understood that the materials and finish of the several parts employed may be such as the experience and judgment of the manufacturer may dictate or various uses may demand.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. An automatic discharge mechanism for settling tanks, comprising a discharge member spaced from and disposed below the tank, a bowl below the tank and interposed between the tank and the discharge member so that settling matter from the tank is permitted to settle in the bowl and later discharge into the discharge member, a valve carried by the bowl and normally forming a closure for the discharge member, and means for permitting vertical movement of the valve and the bowl when a predetermined amount of matter has settled therein to permit discharge of settling matter.

2. An automatic discharge mechanism for

settling tanks comprising a discharge member disposed below a discharge opening in a tank and in alignment therewith, a vertically disposed cylindrical shaped elongated bowl interposed between the discharge opening and the discharge member, a flexible conduit forming a connection between the discharge opening in the bottom of the tank and the upper end of the bowl, a second flexible conduit forming a connection between the bottom of the bowl and the discharge member, said bowl and conduits permitting the settling matter from the tank to pass to the discharge member, and a valve carried by the bowl and normally forming a closure for the discharge member.

3. An automatic discharge mechanism for settling tanks comprising a discharge member disposed below a discharge opening in a tank and in alignment therewith, a vertically disposed cylindrical shaped elongated bowl interposed between the discharge opening and the discharge member, a flexible conduit forming a connection between the discharge opening in the bottom of the tank and the upper end of the bowl, a second flexible conduit forming a connection between the bottom of the bowl and the discharge member, said bowl and conduits permitting the settling matter from the tank to pass to the discharge member, and a valve carried by the bowl and normally forming a closure for the discharge member, said flexible conduits permitting free vertical movement of the bowl and the valve, and means supporting the bowl and permitting downward movement of the bowl and the valve when the predetermined quantity of settling matter has collected in the bowl.

4. An automatic discharge mechanism for settling tanks comprising a discharge member disposed below a discharge opening in a tank and in alignment therewith, a vertically disposed cylindrical shaped elongated bowl interposed between the discharge opening and the discharge member, a flexible conduit forming a connection between the discharge opening in the bottom of the tank and the upper end of the bowl, a second flexible conduit forming a connection between the bottom of the bowl and the discharge member, said bowl and conduits permitting the settling matter from the tank to pass to the discharge member, and a valve carried by the bowl and normally forming a closure for the discharge member, said flexible conduits permitting free vertical movement of the bowl and the valve, a pivoted lever, means for supporting the bowl with relation to one end of said lever, and an adjustable counterweight on the other end of the lever.

IRVIN S. THYLE,

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