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J. F. DORNFELD.
VALVE FOR STEEP TANKS.
APPLICATION FILED OCT. 7, 1905.

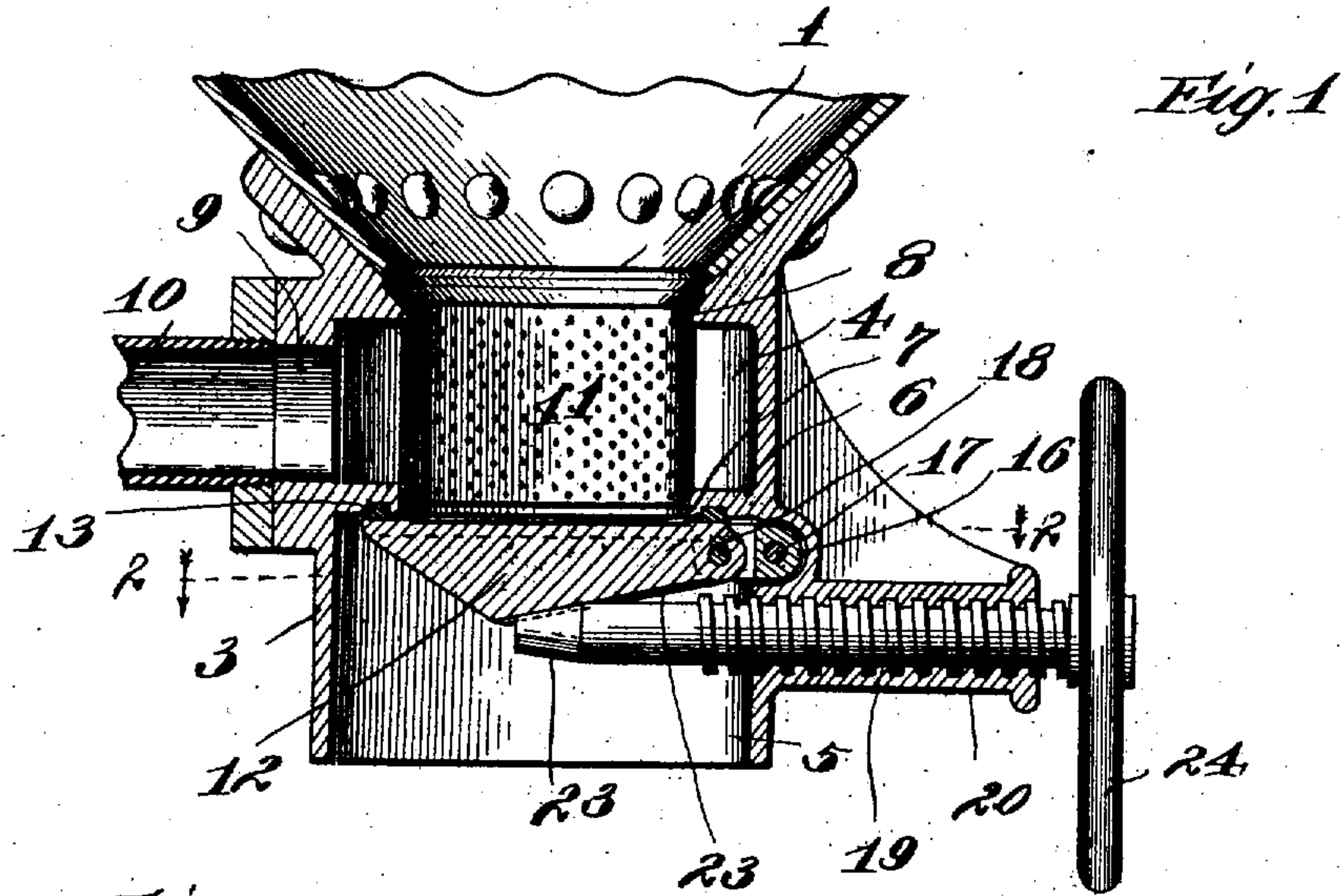


Fig. 2.

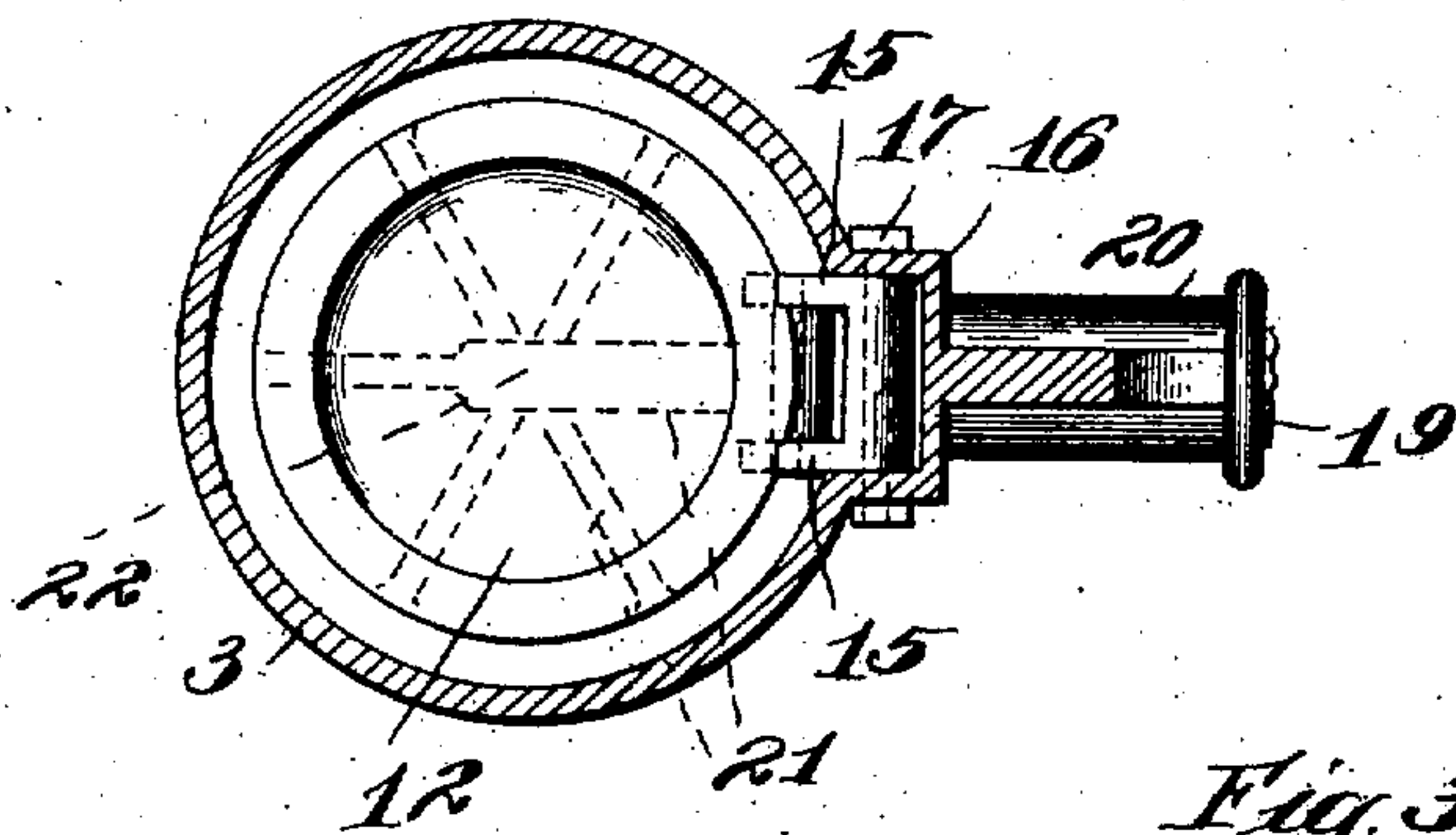


Fig. 3.

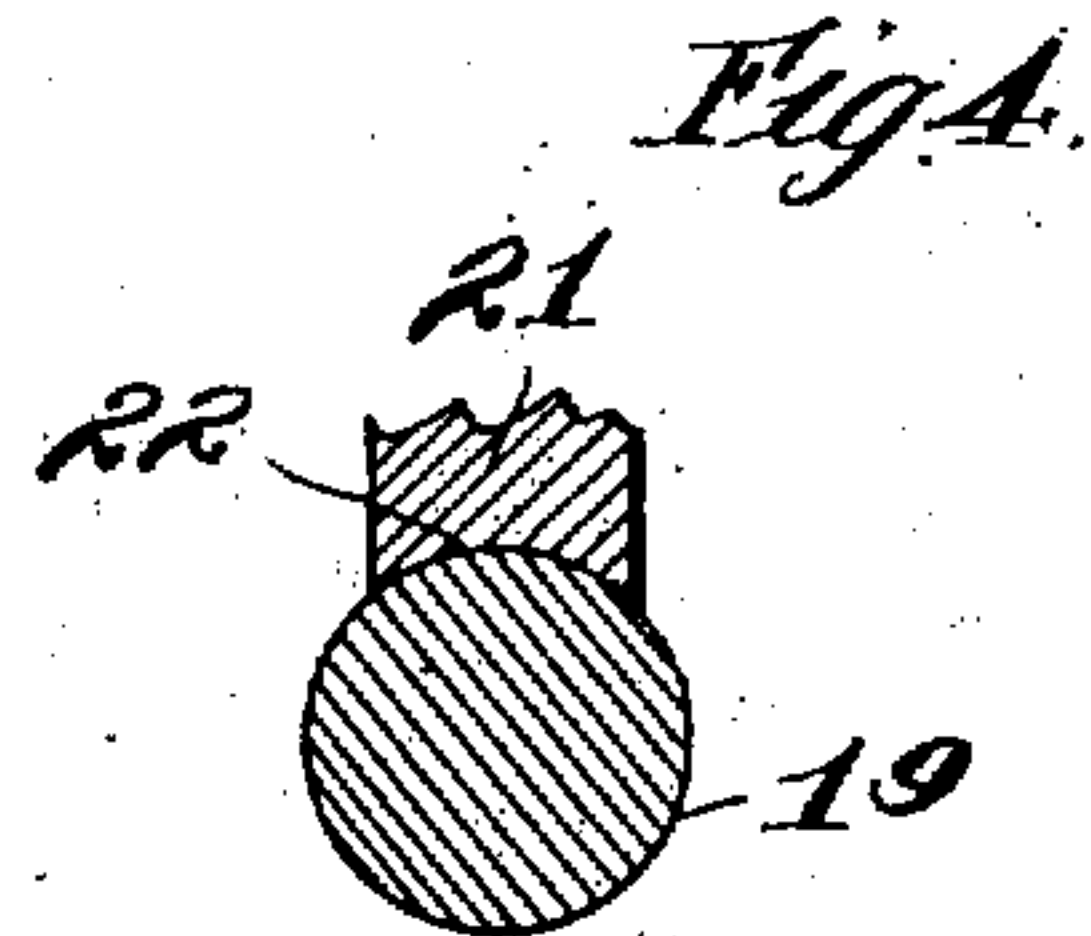
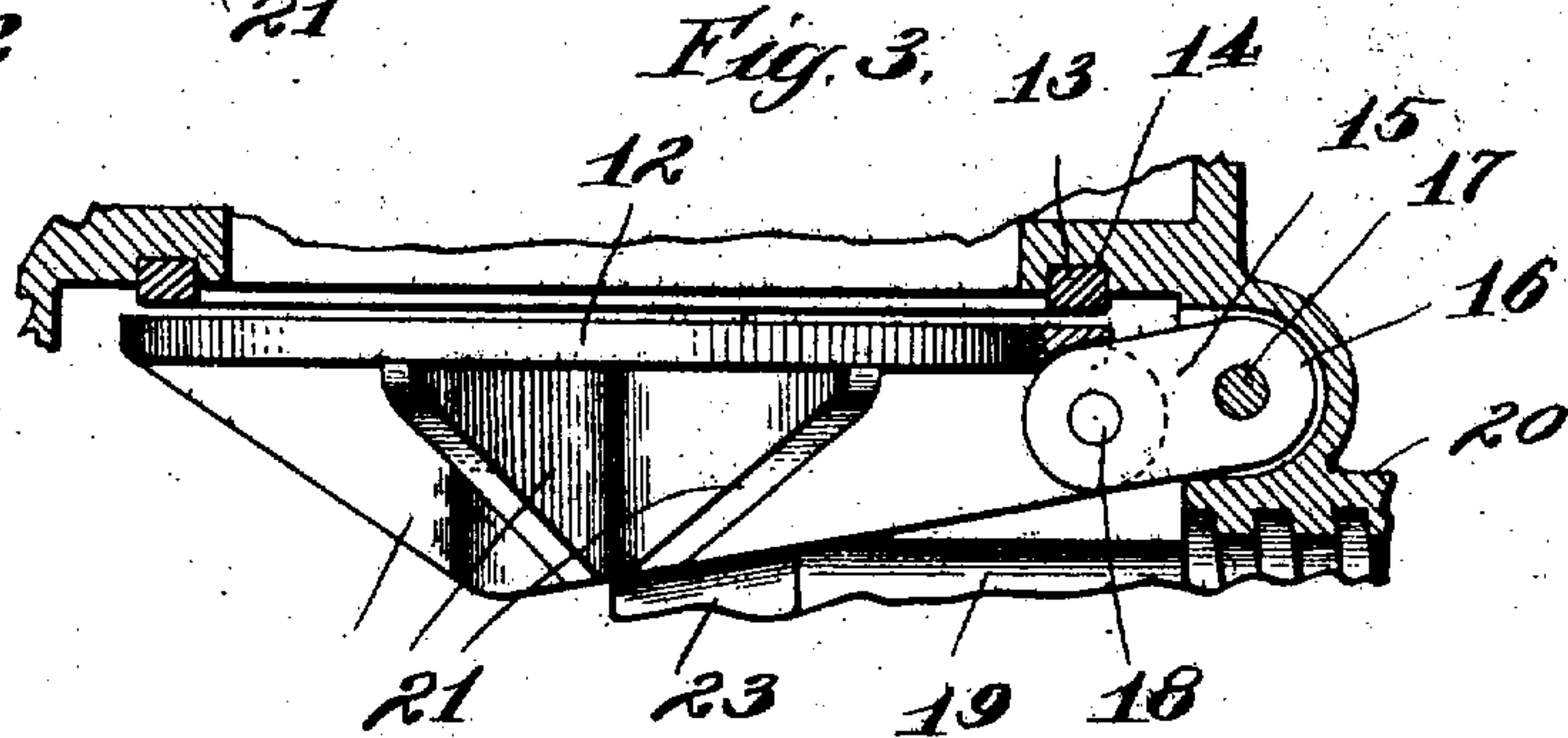


Fig. 4.



Witnesses

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VALVE FOR STEEP-TANKS.

No. 850,215.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN F. DORNFELD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valves for Steep-Tanks, of which the following is a specification.

In the operation of malting grain is steeped for a suitable period of time in large tanks, and for convenience in emptying such tanks a discharge-opening is arranged in the bottom thereof. As will be readily understood, the weight of the water and grain filling the tank exerts a very considerable pressure upon the valve closing the discharge-opening, and if said valve be not tightly seated leakage will occur. In valves for steep-tanks as heretofore constructed the valve-closure has been connected with the valve-casing in such a way that when the closure was tightly seated against the packing-ring surrounding the discharge-opening said ring was subjected to unequal pressure upon its different portions, quickly resulting in leakage and necessitating frequent repairs.

The object of this invention is the production of an improved valve for the grain-discharge opening of steep-tanks which shall overcome the objections hereinbefore alluded to and which shall embody the other and further improvements hereinafter set forth.

In the accompanying drawings, Figure 1 is a vertical central section through the lower end of a steep-tank provided with a valve embodying the features of my invention. Fig. 2 is a horizontal section through said valve on dotted line 2 2 of Fig. 1. Fig. 3 is an enlarged view of the valve proper, illustrating the same as slightly opened. Fig. 4 is a fragmental detail view showing the connection between the valve-closure and the closing-screw.

In the drawings, 1 refers to the conical lower end of a steep-tank, 2 being the outlet-opening for said tank. Riveted or otherwise secured to the lower end of said tank is a valve-casing 3, comprising chambers 4 and 5, separated by a partition 6. An opening 7 in the valve-casing communicates between the interior of the steep-tank and the chamber 4, and an opening 8, alined with the opening 7, connects the chambers 4 and 5. The chamber 5 is open at its lower side to permit the free passage of the steeped grain through the valve-casing 3. In one side of the valve-casing 3 is a water inlet and outlet opening

9, by means of which communication is established between the chamber 4 and a water-pipe 10, secured in any suitable manner to the valve-casing 3. A cylindrical screen 11, of perforated metal, is secured at its ends to the walls of the openings 7 and 8, said screen permitting the passage of water from the pipe 10 into the steep-tank and from said tank into the pipe 10, but preventing the escape of grain into the chamber 4 or the pipe 10. The opening 8 is arranged to be closed by means of a valve-closure 12, said closure seating against a packing-ring 13, of rubber or other suitable material, lying in a groove 14 in the under side of the partition 6. The closure 12 is circular in outline and at one point has a hinge connection with the valve-casing. In order that said valve when moved upon its hinge into contact with the yielding packing-ring 13 shall not press harder against said ring at its hinge connection than at any other point, I have provided a hinge connection constructed as follows: Two links 15, formed integral with or fixed rigidly to a sleeve portion 16, are pivotally mounted in the valve-casing 3 by means of a bolt or pivot-pin 17, extending through said closure. The outer ends of said links are pivotally connected with the valve-closure 12 by means of a pin 18. It will thus be seen that the closure 12 is free to have an upward movement at its hinge side, as well as at every other point, and therefore that the packing-ring 13 will not be pressed more tightly at one point than at another.

The means for moving the valve-closure 12 into its closed position is located at one side of the chamber 5 and comprises a screw 19, lying within an interiorly-screw-threaded tubular stem 20, formed integral with the valve-casing 3. Upon the under side of the valve-closure 12 are formed radial strengthening-ribs 21, the inner ends of which are of greater height than the outer ends. One of said ribs has formed in its lower edge a groove 22, extending from a point near the hinge connection of said valve-closure to the lowest point of said rib. The inner end 23 of the screw 19 is tapering and is adapted to lie within the groove 22. Upon the outer end of the screw 19 is secured a hand-wheel 24 for rotating the screw. As will be seen, a movement of the screw 19 in one direction will force the valve-closure 12 upward to close the opening 8, and a movement of the screw in the opposite direction will permit

said valve-closure to drop into a substantially vertical position against the inner wall of the chamber 5.

In use the valve-closure 12, having first been placed in the closed position, the grain is placed in the steep-tank and the water for steeping the grain is forced into the tank through the pipe 10, the chamber 4, and the screen 11. After the grain has been subjected to the steeping operation for a suitable length of time the water is withdrawn from the tank through the pipe 10. The steeped grain is then discharged from the tank by rotating the screw 19 in the direction to permit the valve-closure 12 to be opened by its own weight and the pressure of the grain. The flow of grain from the steep-tank is not obstructed by the valve-closure or the means for operating said closure. When in its closed position, the closure 12 is supported beneath substantially its center by the screw 19 and bears with a uniform pressure against all parts of the packing-ring 13.

I claim as my invention—

1. In a valve for steep-tanks, in combination, a valve-casing having a valve-opening therein; a closure for said opening; a link connecting one side of said closure with said casing, said closure being capable of a considerable amount of movement with relation to said link; and a member mounted at one side of said valve-casing and arranged to have a movement in a line at right angles with the axis of said valve-opening, the inner end of said member being adapted to engage the rear side of said closure for moving said closure with relation to said link.

2. In a valve for steep-tanks, in combination, a valve-casing having an opening therein; a closure for said opening; a link connecting one side of said closure with said casing, said closure being capable of a considerable amount of movement with relation to its link, said casing having at one side an interiorly-screw-threaded tubular stem; a screw engaging the screw-threads in said tubular stem and extending in a line substantially at a right angle with the axis of said valve-opening, the inner end of said screw being arranged to bear against the rear side of said valve-closure for moving said closure with relation to said link; and means for rotating said screw.

3. In a valve for steep-tanks, in combination, a valve-casing adapted to be secured

to the lower end of a steep-tank, said casing having two chambers therein separated by a partition, said partition having a valve-opening therein, the upper chamber communicating with the interior of the steep-tank, and the lower chamber being open at its lower side; a valve-closure in said lower chamber; a link for connecting said closure at one side with said valve-casing said closure being capable of a considerable amount of movement with relation to said link; and means located at one side of said lower chamber and withdrawable from said chamber for pivotally moving said valve-closure with relation to said link.

4. In a valve for steep-tanks, in combination, a valve-casing adapted to be secured to the lower end of a steep-tank, said casing having two chambers therein separated by a horizontal partition, said partition having a valve-opening therein, the upper one of said chambers communicating with the interior of the steep-tank; a packing-ring located upon the under side of said partition and surrounding said valve-opening; a closure adapted to be seated on said valve-ring and having a link connection with said valve-casing, said closure being arranged to drop by gravity into a substantially vertical position against one wall of the lower chamber; and a screw extending into said lower chamber in a line at right angles with the axis of said valve-opening and arranged to force said closure against said packing-ring, the inner end of said screw being withdrawable from said lower chamber.

5. In a valve for steep-tanks, in combination, a valve-casing adapted to be secured to the lower end of a steep-tank, said casing having a lower chamber therein; a cylindrical screen connecting the interior of said steep-tank with said lower chamber; an upper chamber in said valve-casing surrounding said screen and communicating with a source of water-supply; a closure having a link connection at one side with said valve-casing for closing communication between the steep-tank and said lower chamber; and means located at one side of said lower chamber and withdrawable from said chamber for pivotally moving said valve-closure upon its link connection.

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