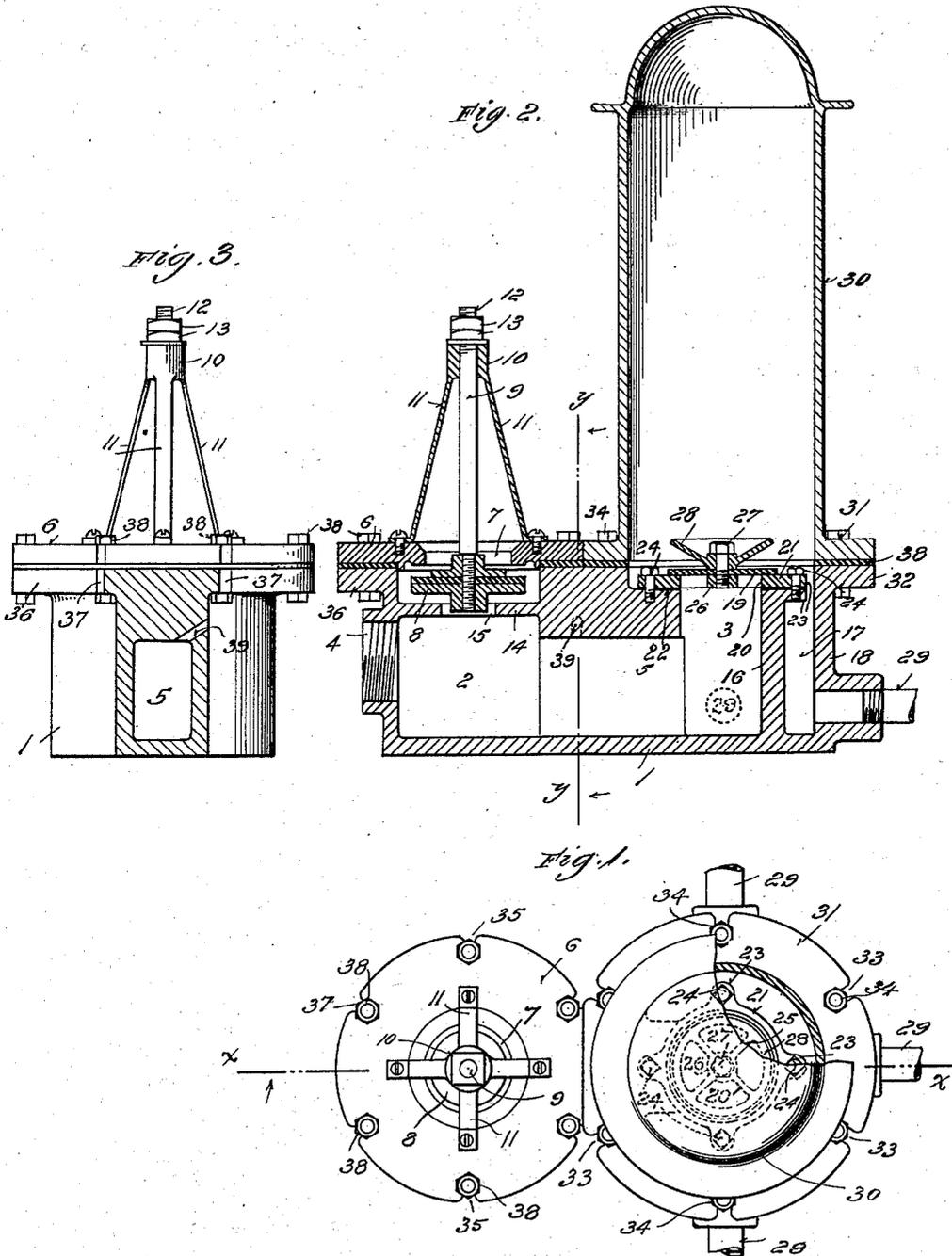


No. 748,113.

PATENTED DEC. 29, 1903.

S. S. SMITH.
HYDRAULIC RAM.
APPLICATION FILED FEB. 6, 1903.

NO MODEL.



WITNESSES:

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UNITED STATES PATENT OFFICE.

SANDIE S. SMITH, OF CHESTER, PENNSYLVANIA, ASSIGNOR TO NIAGARA HYDRAULIC ENGINE COMPANY, OF CHESTER, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

HYDRAULIC RAM.

SPECIFICATION forming part of Letters Patent No. 748,113, dated December 29, 1903.

Application filed February 6, 1903. Serial No. 142,134. (No model.)

To all whom it may concern:

Be it known that I, SANDIE S. SMITH, a citizen of the United States, residing at Chester, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Hydraulic Rams, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to hydraulic rams, and has for its object to improve the simplicity and efficiency of the device, it being in the general nature of an improvement upon the construction set forth in Letters Patent No. 529,914, granted November 24, 1894, to Jones and Wetmore.

To this end my invention consists in certain novel features, which I will now proceed to describe and then will particularly point out in the claims.

In the accompanying drawings, Figure 1 is a plan view of a ram embodying my invention, the same being shown partly in horizontal section. Fig. 2 is a vertical sectional view taken on the line *xx* of Fig. 1 and looking in the direction of the arrows, and Fig. 3 is a sectional view taken on the line *yy* of Fig. 2 and looking in the direction of the arrows.

In the said drawings, 1 indicates the base of the ram, which is preferably formed in a single piece and has provided therein at one end a valve-chamber 2 for the impetus-valve and at the other end a valve-chamber 3 for the main valve.

4 indicates an inlet-opening to which the drive-pipe is connected, and 5 indicates a passage connecting the valve-chambers 2 and 3.

The valve-chamber 2 is closed at its upper end by a cover 6, secured in place in the manner hereinafter described and having formed therein a waste-outlet opening 7, controlled by the impetus-valve 8. This latter valve is of a disk-like form and of greater diameter than the opening 7, which it closes when raised.

9 indicates the impetus-valve stem, which travels through a combined stop and guide 10, supported by legs 11 on top of the cover

6. The upper end of the valve-stem 9 is threaded, as indicated at 12, to receive one or more nuts 13, which may be adjusted so as to limit the downward movement of the impetus-valve, and thus regulate the operation of the ram in a well-known manner.

Heretofore an excessive waste of water has occurred at the impetus-valve, owing to the water flowing too freely around the valve before it is lifted. To prevent this, I provide in the upper portion of the valve-chamber 2, below the valve 3, a diaphragm 14, having opposite the valve an opening 15, which serves to restrict the flow of the waste water and cause it to flow directly against the under side of the valve. In this way the flow of water being restricted the amount of waste is less, and as the water acts more efficiently and directly against the valve it is closed with less waste.

The valve-chamber 3 of the main valve is circular in form, being surrounded by a cylindrical wall 16, which is in turn surrounded by an annular space 17 between the wall 16 and the circular outer wall 18 of the body of the ram. It is true that at one side, where the passage 5 connects with the chamber 3, these annular walls and spaces are interrupted; but with this exception their form is as described. The main valve 19, which controls the outlet of the valve-chamber 3, is located at the top of said valve-chamber, where the said outlet is located, and it consists of a flexible disk, of rubber or the like, secured at its center and free at its margin. To secure this valve in position, I employ a spider 20, having an annular marginal portion 21, seated on top of the wall 16, a packing 22 being interposed between them. Both the spider and the wall have projected lugs 23 to receive bolts 24, by which the spider is held in place. Arms 25 extend inward from the annular portion to a central sleeve 26, which receives a bolt 27, which fastens the center of the disk 19 to the spider. This is preferably effected by means of a conical stop 28, interposed between the bolt-head and disk, said conical stop serving to limit the opening movement of the disk valve in an obvious manner.

It will be seen that the main valve and the outlet which it controls are so located that the water issuing from the valve-chamber 3 is equally distributed in all directions to the annular space 17. Outlet connections 29 lead from this annular space on the three free sides thereof, so that the delivery-pipe may be connected to any side of the delivery-chamber formed by the annular space 17, with an assurance that an equal supply of water will be delivered to said pipe wherever it may be connected.

30 indicates the air-chamber, which is provided at its lower end with a horizontal flange 31. The base is provided with a corresponding flange 32, and these flanges are provided with marginal notches 33, which register with each other and are adapted to receive the connecting-bolts 34. It will be seen that these bolts may be readily slipped into position and as readily removed without necessitating the entire removal of the nuts, thus materially facilitating the assembling or taking apart of the air-chamber and base. The cover 6 is provided with similar notches 35 at its margin, and the base is provided with a corresponding flange 36, having notches 37, which register with the notches 36 to receive connecting-bolts 38, thus rendering the cover 6 also readily removable. It will be understood, of course, that a suitable packing 38 is interposed between the base 1 and the air-chamber and cover mounted thereon.

In order to provide an automatic air-supply, I form an air-inlet port 39 in that portion of the base lying between the two valve-chambers and above the connecting-passage 5. The lower end of this port opens into the top or highest part of the connecting-passage, and it extends thence upward and outward to the vertical side of the intermediate part of the base, in which it has its external opening. By reason of this location the said air-inlet port is less liable to become clogged or obstructed, its outer end being unexposed, while its connection with the connecting-passage 5 is such as to insure the maximum efficiency of operation.

I do not wish to be understood as limiting

myself to the precise details of construction 50 hereinbefore described, and shown in the accompanying drawings, as it is obvious that said details may be modified without departing from the principle of my invention.

Having thus fully described my invention, 55 what I claim as new, and desire to secure by Letters Patent, is—

1. In a hydraulic ram, the combination, with a valve-chamber having a vertical waste-outlet at the top, and a diaphragm located 60 below said outlet and having a restricted opening in line therewith, the space between said diaphragm and the top of the chamber being free and unobstructed, of a disk valve located in said space and having a diameter 65 less than that of the valve-chamber and greater than that of the waste-outlet, its lower face and edge being exposed to the water entering and passing through said space, and its range of movement being such as to permit it to close the waste-outlet in the top of the valve-chamber when fully raised, substantially as described. 70

2. In a hydraulic ram, the combination, with a main valve-chamber having a substantially circular wall and an outlet-valve 75 at the top, of a body surrounding the same and separated therefrom to form a substantially annular delivery-chamber surrounding the valve-chamber and below the outlet 80 thereof, substantially as described.

3. In a hydraulic ram, the combination, with a main valve-chamber having a substantially circular wall and an outlet-valve 85 at the top, of a body surrounding the same and separated therefrom to form a substantially annular delivery-chamber surrounding the valve-chamber and below the outlet 90 thereof, said body having a plurality of delivery-pipe-connection openings located at different points of its circumference, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

SANDIE S. SMITH.

Witnesses:

E. C. WHITE,
CHAS. R. LONG.