

A. C. PAULSMEIER.
CENTRIFUGAL PUMP ATTACHMENT.
APPLICATION FILED JULY 12, 1912.

1,111,319.

Patented Sept. 22, 1914.

Fig. 1.

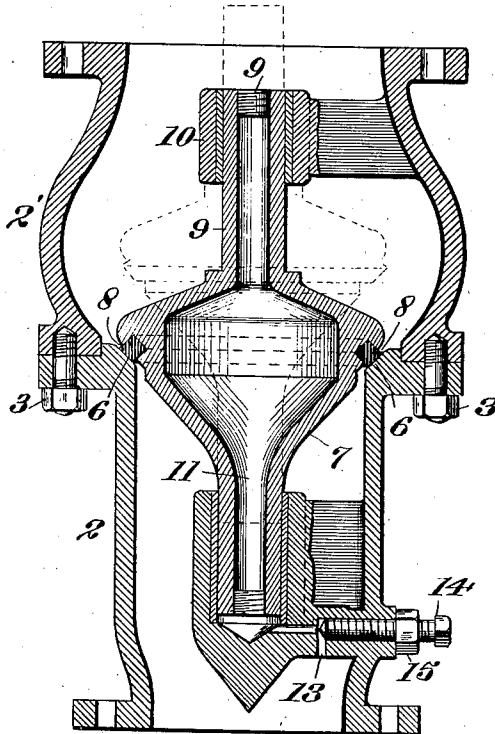
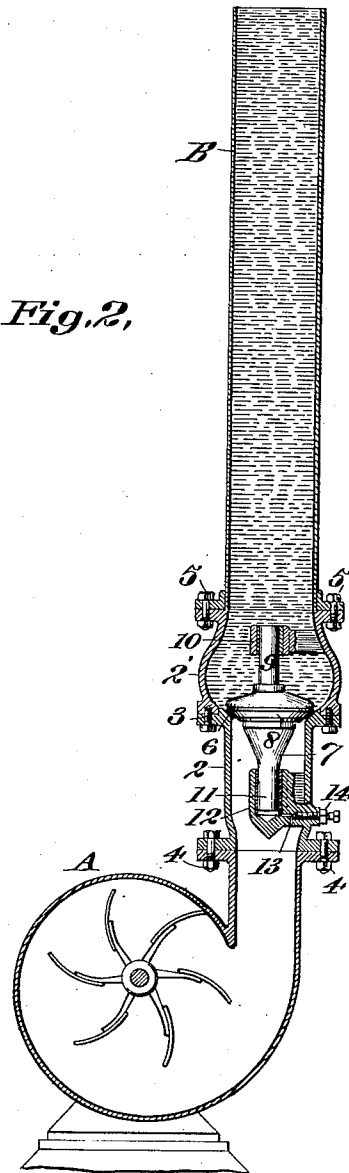


Fig. 2.



WITNESSES:

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CENTRIFUGAL-PUMP ATTACHMENT.

1,111,319.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALBERT C. PAULSMEIER, a citizen of the United States, residing at Alameda, in the county of Alameda and State of California, have invented new and useful Improvements in Centrifugal-Pump Attachments, of which the following is a specification.

This invention relates to a. check-valve, and particularly pertains to a check-valve which is especially adapted for use in connection with centrifugal pumps.

It is the object of this invention to provide a slow seating check-valve which is adapted to close without slamming when the flow of liquid therethrough is suddenly stopped.

A further object is to provide a non-slamming Check-valve which is simple in construction and which is adapted to be regulated to consume any amount of time desired in coming to a closed position.

The invention primarily resides in a means for water cushioning a valve and means for regulating the effectiveness of the water cushion.

The invention further consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a vertical section of the check-valve. Fig. 2 is a vertical section of a centrifugal pump showing the invention as applied.

In the drawings A represents a centrifugal pump of any suitable description, the discharge outlet of which connects with a valve casing which is interposed between the outlet of the centrifugal pump A and a delivery pipe B. The valve casing just referred to consists of two tubular portions 2 and 2', which are formed with outwardly extending flanges at their ends, and are connected together by means of bolts 3. The outer end of the portion 2 is connected to the centrifugal pump A by means of bolts 4, and the outer end of the portion 2' is connected to the pipe B by means of bolts 5.

Formed on the inner end of the portion 2 is a beveled valve seat 6, on which a conical shaped valve 7 is designed to rest; a packing ring 8 of any suitable material being mounted on the valve 7 in such position as to contact the valve seat 6 and form a tight

joint at this point. The conical valve 7 is provided with an upwardly projecting portion 9, forming a stem which is mounted to reciprocate in a guide bearing 10, carried by the portion 2' of the valve casing; the stem 9 extending axially of the tubular valve casing. The valve 7 is provided with a downwardly projecting portion 11, which extends in alinement with the stem 9 and into which the tapered underside of the valve 7 converges, forming a plunger. This plunger 11 projects into a dash pot 12 carried by the portion 2 of the valve casing; the plunger 11 being so proportioned to the dash pot 12 as to have a free sliding movement therein, and to allow the passage of a limited amount of water to and from the dash pot around the plunger.

Formed in the dash pot 12 is a passage 13 which leads from the underside of the dash pot and opens to the interior thereof, and through which passage a portion of the contents of the dash pot are expelled, as will be presently described. Means are provided for adjusting the area of the passage 13, so as to regulate the quantity of water that can flow therethrough in a certain time, which means is here shown as consisting of a needle valve 14 mounted in the portion 2 of the valve casing; a jam nut 15 being threaded on the needle valve by means of which the valve may be locked in any desired position.

The operation of the invention is as follows: When the pump A is being operated, the valve 7 is lifted from its seat 6 by the pressure of the water against its conical underside; the constant flow of water induced by the pump A retaining the valve in its unseated position, as indicated in dotted lines in Fig. 1. The valve being formed with a gradually increasing diameter on its underside acts to spread the column of water flowing thereagainst, and thereby offers little resistance; the portion 2' of the valve casing being enlarged at a point adjacent the valve to admit of a free flow of the water around the valve. The portion 2' of the valve casing gradually converges toward the pipe B above the valve 7 so as to offer as little obstruction to the flow of water therethrough as possible. When the valve 7 is in its uppermost position, the plunger 11 will be partially withdrawn from the dash pot 12, whereupon the space within

the dash pot will be filled by the water which enters the dash pot through the passage 13 and around the plunger 11.

It will now be seen that when the pump 5 A is thrown out of operation, the volume of water in the pipe B above the valve 7 will act to force the latter downward upon the seat 6. The valve 7 in moving downward causes the plunger 11 to act on the water in 10 the dash pot 12 in such manner as to force it through the passage 13 and around the plunger 11. By adjusting the area of the passage 13, the speed of the water forced therethrough may be regulated so as to vary 15 the resistance offered by the water in the dash-pot 12 to the plunger 11 as may be required, and according to the weight of the column of water in the pipe B. The resistance of the water in the dash-pot against 20 the plunger 11 cushions the downward movement of the valve 7, so as to allow it to come to rest on the valve seat without causing a slam or water hammer.

The adjustment of the area of the passage 25 13 is accomplished by means of the needle valve 14, which controls the speed of flow of the volume of water ejected from the dash-pot 12 by the plunger 11, thereby admitting of the speed of the valve in coming 30 to its seated position being readily governed.

By constructing the valve casing in two separable parts, the assembling of the valve is facilitated, and admits of access being 35 had to the valve for removal and replacement of the packing ring 8, or other repairs.

The valve 7 with its stem 9 and plunger 11 are preferably formed integral by casting in one piece, and are hollowed out to 40 reduce the weight of the valve to a minimum.

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

1. An attachment for centrifugal pumps 45 comprising upper and lower tubular sections, a guide member carried by the upper section, a dash pot carried by the lower section, and a reciprocating valve having cylindrical projections from the opposite faces 50 thereof for sliding in said guide member and said dash pot, the said valve being formed

to discharge tangentially to the upper section.

2. An attachment for centrifugal pumps comprising upper and lower tubular sections, a guide member carried by the upper 55 section, a dash pot carried by the lower section, a passageway leading from the bottom of the dash pot, means for closing said passageway, and a reciprocating valve having 60 cylindrical projections from the opposite faces thereof for sliding in said guide member and said dash pot, the sides of said valve being substantially tangential to the upper 65 tubular section.

3. An attachment for centrifugal pumps comprising a lower cylindrical section, an upper bulb-shaped section, a valve seat 70 formed on said lower section, a downwardly tapering valve normally seated on said valve seat, projections from the opposite faces of 75 said valve, means carried by the upper section for engaging the projection from the upper face of the valve to guide the same, and a dash pot carried by the lower section 75 and forming a cylinder for the projection from the lower face of the valve, the sides of said valve being substantially tangent to the upper bulb-shaped section.

4. An attachment for centrifugal pumps 80 comprising a lower cylindrical section, an upper enlarged bulb-shaped section, a valve seat formed on the top of the lower section, a valve having a conical lower portion normally seated on said valve seat, a cylindrical 85 projection below the conical portion of said valve, a second cylindrical projection on the upper portion of said valve, and means carried by each of said sections for engaging the respective projections on the 90 valve, the conical sides of said valve forming substantially a continuation of the sides of the upper bulb-shaped section so as to direct the discharge past the valve tangentially of the upper section. 95

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

ALBERT C. PAULSMEIER.

Witnesses:

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W. A. SHEEHAN.