

No. 649,332.

Patented May 8, 1900.

S. MATTSON.
CENTRIFUGAL PUMP.

(Application filed Mar. 31, 1899.)

(No Model.)

FIG. 1.

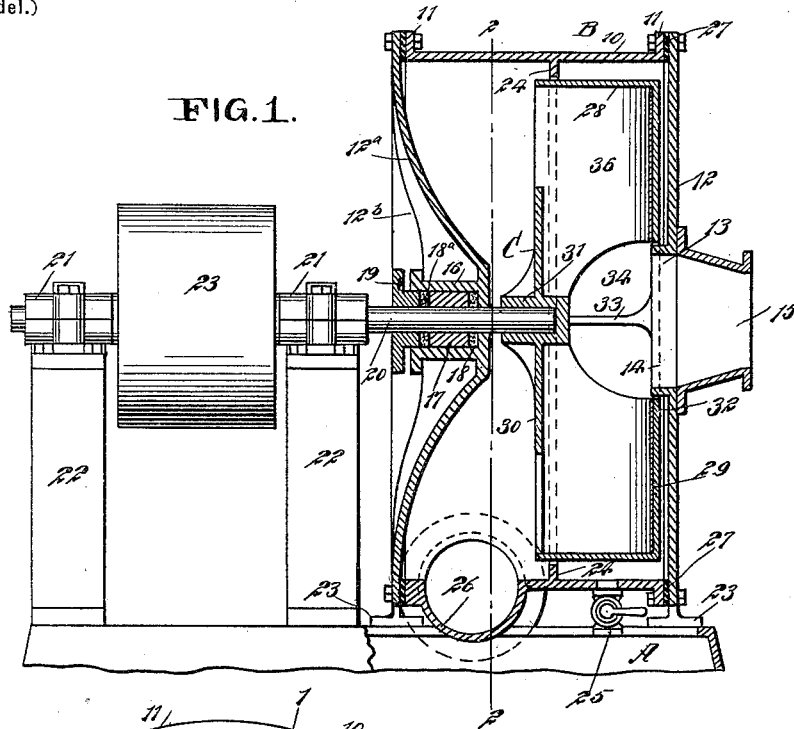


FIG. 2.

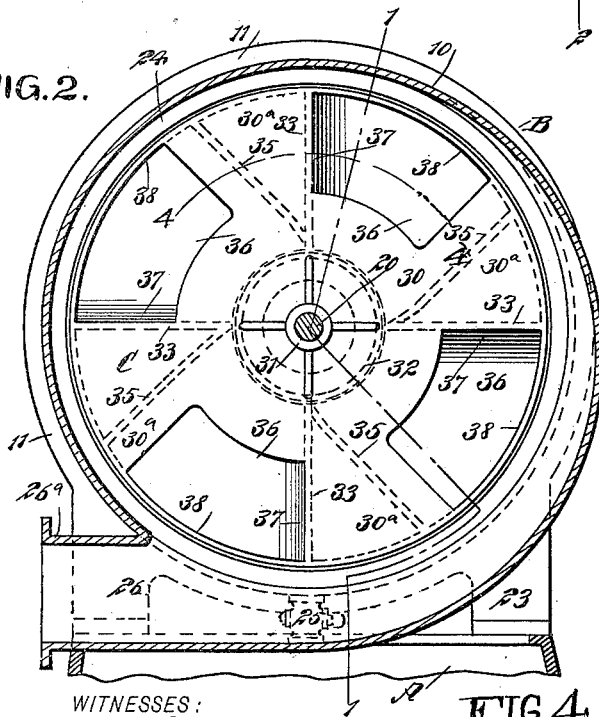


FIG. 3.

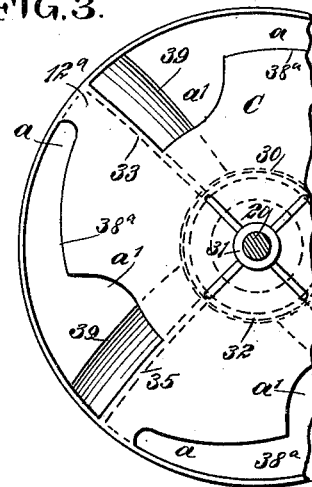
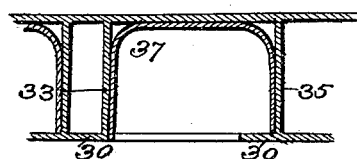


FIG. 4.



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CENTRIFUGAL PUMP.

SPECIFICATION forming part of Letters Patent No. 649,332, dated May 8, 1900.

Application filed March 31, 1899. Serial No. 711,270. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL MATTSON, of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Centrifugal Pump, of which the following is a full, clear, and exact description.

One object of my invention is to provide a centrifugal pump so constructed that it will not become clogged by stones or other obstructions that may pass the piston; and a further object of the invention is to provide a pump of the character above described that will be exceedingly simple, durable, and economic and that will pump liquid containing obstructions as readily and without detriment to the machinery as though the liquid were free from any solids.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical section through the improved pump, the section being taken practically on the line 1 1 of Fig. 2. Fig. 2 is a vertical section through the pump, taken at right angles to the section shown in Fig. 1 and on the line 2 2 of Fig. 1. Fig. 3 is a partial side elevation of a piston adapted for use when clear liquid is to be pumped or liquid mixed with sand or similar material, and Fig. 4 is a section on line 4 4 of Fig. 2.

A represents a base, B the cylinder of the pump, mounted on said base, and C the rotary piston, mounted to revolve within said cylinder. The cylinder consists of a body-shell 10, provided with an outwardly-extending marginal flange 11 at each of its edges and a front plate 12 and a back plate 12^a, the back plate being preferably curved inward at its center and strengthened by ribs 12^b. The curvature of the back plate is made in order that the distance between the center of the front and back plates of the cylinder shall be less than the distance between said plates at the periphery of the cylinder. The front plate 12 of the cylinder is provided with a

central opening 13, and at this opening an inwardly-extending circular flange 14 is formed, as shown in Fig. 1, and at said opening is attached a nozzle 15.

At the central portion of the back plate 12^a of the cylinder a stuffing-box 16 is located, containing a block 17, a packing 18 between the said back plate of the cylinder and the block, and a front packing 18^a, which is engaged by a cap 19, fitted into the stuffing-box and secured thereto in any suitable or approved manner. The cap and block of the stuffing-box are adapted to journal a shaft 20; the inner end of which shaft is passed through the back plate of the cylinder B and is secured in any suitable manner to the piston C, as shown in Fig. 1. The outer portion of the shaft 20 is shown as maintained in boxes 21, supported on pedestals 22, attached to the base A, and a driving-pulley 23 is secured upon the shaft 20 between the said boxes 21. The front and back plates of the cylinder B are provided with legs 23, capable of attachment to the base, and within the body-shell 10 of the casing an annular rib 24 is formed, practically dividing the cylinder into two compartments. The piston C is mounted to turn in the front compartment, a portion of the piston extending through into the rear compartment, and the space between the periphery of the piston C and the rib 24 of the cylinder is just sufficient to admit of the piston turning freely.

It often happens in pumping that sand or small particles may find lodgment in the bottom portion of the forward chamber of the cylinder B, and in order that such substances may be conveniently removed a valved pipe 25 is connected with the bottom of the cylinder, as shown in Fig. 1. The cylinder is provided with an outlet-opening 26 and an outlet-pipe 26^a at said opening. The outlet-opening is produced in the body-shell 10 of the cylinder, and owing to the manner in which the body-shell and front and rear plates of the cylinder are connected the outlet-pipe 26^a may be made to stand horizontally or vertically or may be given any desired inclination between the horizontal and vertical by simply properly adjusting the shell 10 of the cylinder before the front and back plates 12 and 12^a are attached thereto. The front and back

plates 12 and 12^a of the cylinder are secured to the flanges 11 of the shell 10 by means of bolts or their equivalents, and suitable gaskets are located between the flanges 11 and said front and rear plates of said cylinder.

The piston C is circular or of disk formation and is hollow, comprising a body-band 28, a front plate 29, and a back plate 30, secured together in any desired manner. The back plate 30 is provided with a suitable socket or hub 31, in which the inner end of the drive-shaft 20 is secured, and the front plate or head of the piston is provided with an opening 32, into which the flange or collar 14 of the front plate of the cylinder extends, as illustrated in Fig. 1. A series of radial partitions 33 is provided for the interior of said piston, the partitions extending from the front to the rear heads or plates, as shown in Figs. 1 and 2; but the said partitions 33 are cut away or reduced on curved lines, the curvature commencing at the wall of the opening 32 and extending to the hub 31, thus forming a wide entrance 34, that will permit the ready passage of material entering at the nozzle 15 to the spaces between the partitions 33. Auxiliary partitions 35 are connected at an angle with the partitions 33 at points near the hub of the piston, and both the partitions 33 and 35 extend to the body-band of the piston, as shown in dotted lines in Fig. 2. Thus a pocket 36 is formed between each partition 33 and the auxiliary partition 35, which is attached to the adjacent main partition 33. Each pocket is formed with a bottom 37, so that no sharp corners will occur in the pocket between the two partitions defining the length of the same. As shown in the drawings, this curved bottom consists of a U-shaped plate resting upon the front head 29 of the piston and having its ends secured to the partitions 33 and 35 thereof.

Each pocket is provided with an opening 38. This opening is made in the rear head 30, consequently producing a series of arms 30^a at said head, acting in conjunction with a disk-like center, as shown in Fig. 2. These arms on the head 30 may be given any desired shape necessary for the formation of pockets of any desired contour. The end wall of each opening 38, while flush with the bottom plate at a radial partition 33, terminates short of the opposing angularly-arranged partition 35, as is also shown in Fig. 2. Thus it will be observed in operation that the material is taken in at one side of the piston and discharged at the other side—as, for example, water and stones enter at the nozzle 15 and pass into the various pockets through the space 34, and as the piston revolves the stones and water are quickly discharged from the piston when the pockets reach a low level, and the material so discharged finds a ready exit through the outlet-opening 26.

The form of piston shown in Fig. 3 is in-

tended to be used where pure water or water mixed with sand is to be pumped. The construction of the piston shown in Fig. 3 is nearly the same as the construction of the piston illustrated in Figs. 1 and 2, with the exception that the extra partitions 35 are omitted, and likewise the curved bottom 37, the rear head of the piston forming the bottom of each pocket; but each pocket is provided with a downwardly-inclined plate 39 at one of its ends, and the opening 38^a of each pocket is made longer than the opening in the pocket shown in Fig. 2 and consists of a long narrow section *a* and a wide section *a'*, adjacent to the inclined plate 39 of a pocket. Thus the water can find a quick exit at the lengthy contracted section *a*, and any sand or small stones will find an exit at the larger section *a'* of the opening.

A pump constructed as above described will not become clogged even should large stones be drawn into the piston, since the piston can readily discharge said stones, together with the liquid, and by receiving the material at one side of the piston and discharging it at the opposite side the machinery sustains less friction or wear, and the pump may be constructed on simpler and more durable lines than heretofore.

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

1. In a centrifugal pump, a piston, comprising a circular hollow body having a central opening in its front wall and a plurality of openings in its rear wall and provided with a series of radial partitions forming pockets, and with curved plates resting upon the front wall of the body with their ends engaging the partitions, the partitions being cut away or reduced at their inner ends adjacent to the opening in the front wall, substantially as described.

2. In a centrifugal pump, the combination with a cylinder provided with an inlet at its center and an outlet at its periphery, of a piston mounted to revolve in the cylinder, said piston comprising a circular hollow body having a central opening in its front wall registering with the inlet of the cylinder, and a plurality of openings in its rear wall near the periphery and provided with radial partitions forming a series of pockets and with curved plates resting upon the front wall with their ends engaging the partitions and forming the bottoms of the pockets, the said partitions being cut away or reduced on curved lines at their inner ends adjacent to the central opening of the front wall, substantially as described.

3. In a centrifugal pump, the combination with a cylinder having an inlet-opening at the center and an outlet at its periphery, of a piston having an inwardly-projecting hub and mounted to revolve in the cylinder, said piston being provided with a series of pockets,

each having a curved bottom and an outlet-
opening, said outlet-openings being in the
rear wall of the piston near the periphery, the
piston being provided with an inlet-opening
5 in its front wall registering with the inlet-
opening of the cylinder and communicating
with all of the pockets, the division-walls of

the pockets being reduced on curved lines ex-
tending from the front wall to the hub of the
piston, substantially as described.

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