March 16, 1926. 1,577,102

M. BERKSHIRE

PUMP

Filed March 27, 1924 2 Sheets-Sheet 1

Fig. 1.

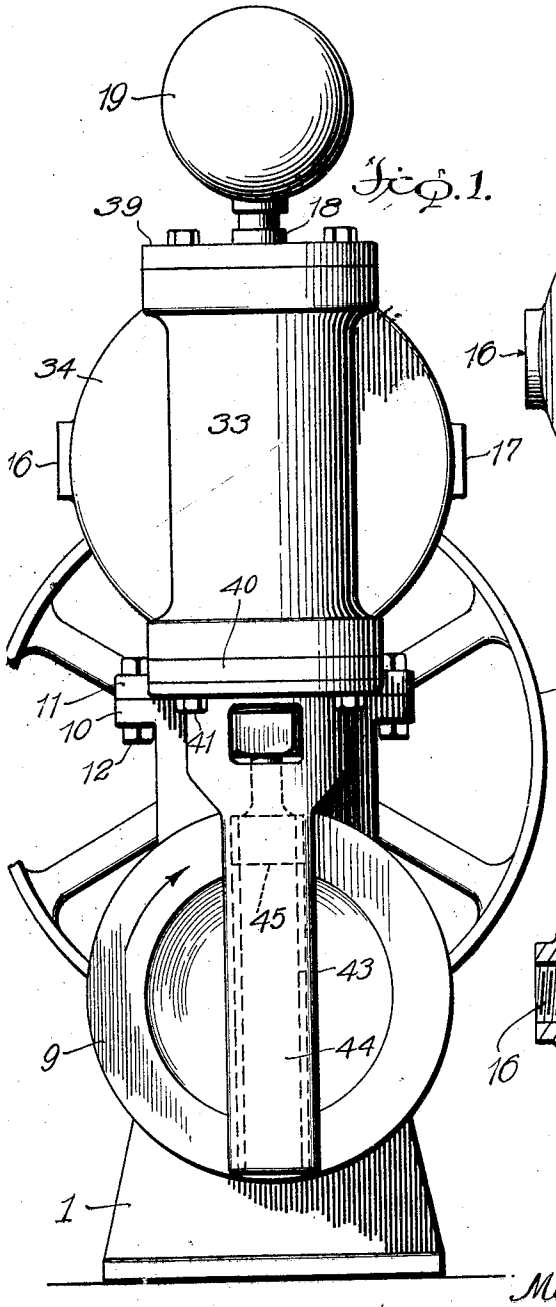


Fig. 4.

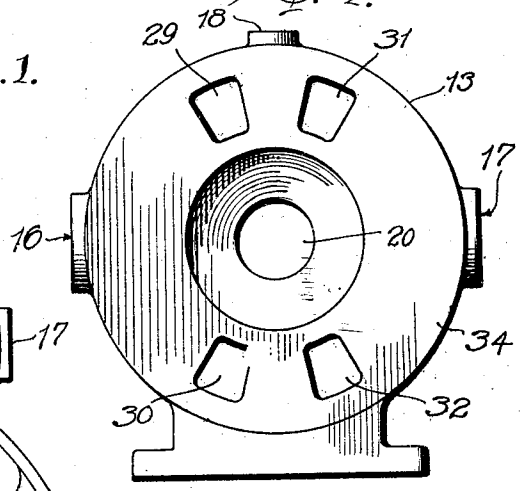
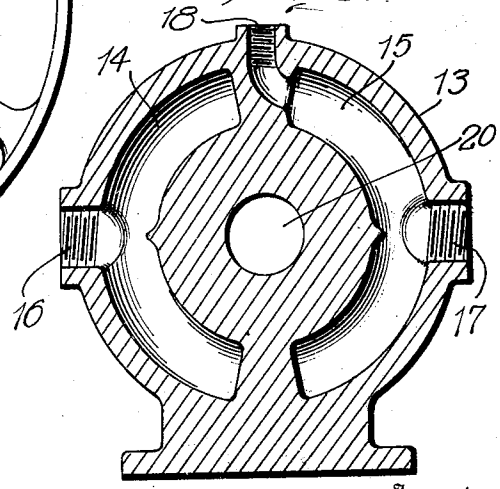


Fig. 5.



Inventor

Melvin Berkshire.

By William C. Linton

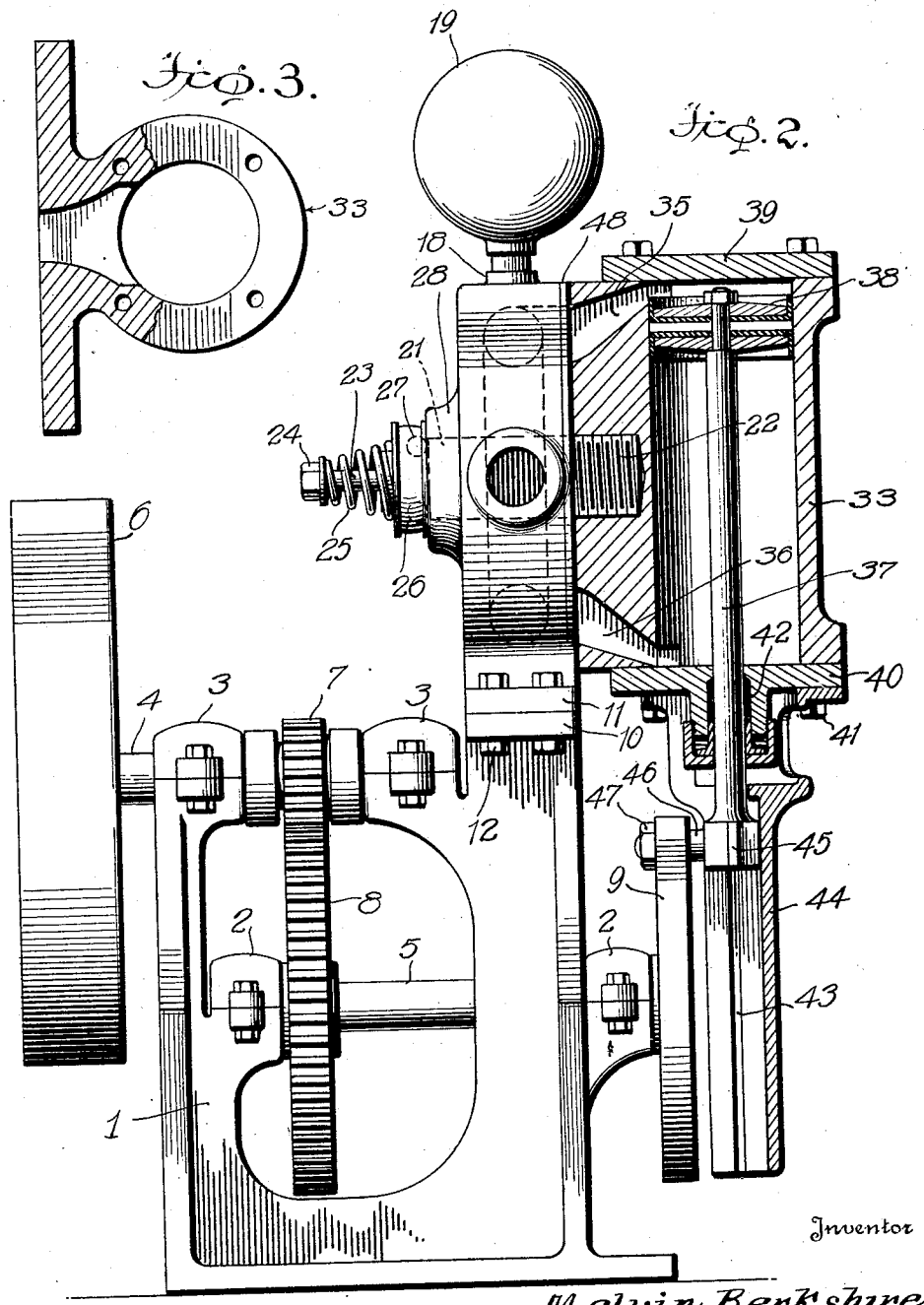
Attorney

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M. BERKSHIRE

PUMP

Filed March 27, 1924 2 Sheets-Sheet 2



Inventor

Melvin Berkshire

By William C. Fuller.

Attorney

Patented Mar. 16, 1926. 1,577,102

UNITED STATES PATENT OFFICE.

MELVIN BERKSHIRE, OF NEWCOMERSTOWN, OHIO, ASSIGNOR OF ONE-HALF TO J. S. BARNETT, ALBERT ZIMMER, AND V. C. STOCKER, ALL OF NEWCOMERSTOWN, OHIO.

PUMP.

Application filed March 27, 1924. Serial No. 702,394.

To all whom it may concern:

Be it known that I, MELVIN BERKSHIRE, a citizen of the United States of America, residing at Newcomerstown, in the county of Tuscarawas and State of Ohio, have invented certain new and useful Improvements in Pumps; and I do hereby declare that the following is a full, clear, concise, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in pumps, having for an object to provide a simple and effectual type of pump for displacing water or other mobile fluid, the construction being operable without valves or similar delicate and intricate parts, but being capable of discharging an even and uniform flow of fluid.

It is also an object of the invention to provide a pump wherein the cylinder thereof is adapted, during operation, to oscillate in order that proper intermittent alinement of the fluid intake and discharge ports will occur in sequential order and an even flow of fluid from the pump will result.

Yet another object of the invention is to provide a pump employing a novel form of water-head having fluid inlet and outlet passages therein adapted to be brought into communication with the pump cylinder in an alternate fashion.

It is a still further object of the invention to provide the water-head with an air dome communicating with the outlet or discharge passage thereof, whereby to relieve the outflowing fluid of excessive air pressure and in consequence, prevent surging of the same within the pump or as it is discharged from the pump, thus producing an even and steady flow of fluid.

Other objects of the invention will be in part obvious and in part pointed out hereinafter.

In order that the invention and its mode of operation may be readily understood by persons skilled in the art, I have in the accompanying illustrative drawings, and in the detailed following description based thereon, set out one possible embodiment of the same.

In these drawings:—

Figure 1 is a side elevation of the improved pump;

Figure 2 is an enlarged elevation taken at substantially right angles to the Figure 1 and showing the pump cylinder in section;

Figure 3 is a top plan view, partly in section, showing the pump cylinder and one of the ports thereof;

Figure 4 is a detail in side elevation of the form of water-head employed; and,

Figure 5 is a vertical section through the same showing the arrangement of the passage ways therein and the fluid inlet and outlet ports, together with the ports whereby the discharge passage is connected to the air dome.

Having more particular reference to the drawings, in connection with which like characters of reference will designate corresponding parts throughout, the pump may be stated to comprise a supporting bed or frame generally indicated by the numeral 1, babbitt lined bearings preferably of the split type, indicated by the numerals 2 and 3, being formed thereon in different horizontal planes and rotatably receiving shafts 4 and 5. The shaft 4, as will be noted, has a fly or pulley wheel 6 fixedly mounted upon its extended extremity, while a pinion 7 is fixedly mounted upon the intermediate portion thereof and meshes with a gear 8 fixedly mounted upon an intermediate portion of the shaft 5. One end of the shaft 5, as will be noted, is extended slightly and has a disk 9 mounted thereupon. A shelf-like bracket is formed upon one part of the upper portion of the supporting bed 1, as indicated by the numeral 10, and serves to receive the pump water-head thereon, such water-head being provided with laterally disposed seats 11 adapted to be arranged directly adjacent and above lateral extensions formed upon the shelf-like bracket 10, whereby connection of the water-head to the supporting bed may be effected by the passing of bolts 12, or other similar fastening devices, through said portions 11 and the laterally extended portions of the shelf-like bracket 10, as clearly shown in the Figures 1 and 2.

A water-head comprising a circular casting or housing, generally indicated by the numeral 13, is provided for the pump and as aforesaid, has lateral extensions or seats 11 formed upon the basal portion thereof whereby it may be fixedly secured in a supported position upon the shelf-like bracket 10 of the pump supporting bed 1. Semi-

circular ways 14 and 15 are formed in the water-head 13, the way 14 constituting the inlet for fluid to be displaced by the pump, while the way 15 serves as an outlet for such fluid; it being noted in this connection that ports 16 and 17 respectively are provided in the passage ways 14 and 15. Also, a port indicated by the numeral 18 is formed in the water-head 13 adjacent the upper end of the passage way 15 and is internally screw threaded whereby an air dome 19 may be tapped or connected thereto, the purpose of which will be subsequently described.

This water-head 13 is provided with a concentrically arranged bearing opening 20, through which a pivot or bearing pin 21 is passed; the inner extremity of this bearing pin being externally screw threaded, as indicated by the numeral 22. A coaxially extending finger or pin 23 is carried upon the outer end of the pivot pin 21 and is provided with a head 24, against which one end of a helical spring 25 is adapted to bear, the remaining end of such spring having engagement or bearing upon a thrust collar 26 provided with ball bearings 27, or other suitable anti-frictional bearing devices, which, as will be noted, are adapted to ride over an adjacent portion of the concentrically arranged circular bearing extension 28.

A plurality of ports indicated by the numerals 29, 30, 31, and 32 are formed in the inner side wall of the water-head 13 and as will be noted, the ports 29 and 30 communicate with the water inlet passage way 14, whereas the ports 31 and 32 communicate with the water or fluid outlet passage way 15. Thus, by means of these ports, communication as between the pump cylinder, to be hereinafter more fully described, and the several passage ways 14 and 15 of the water-head may be effected in order that an even and uniform flow of water will be had from the pump.

A cylinder 33 is provided in the construction, and as will be noted, has a flattened disc-like formation 34 upon one side thereof, through which ports 35 and 36 are extended, the port 35 communicating with the upper end of the cylinder 33, while the port 36 communicates with the lower end thereof. The outer face of the flattened disc-like formation 34 is adapted to have bearing engagement with the flattened adjacent side wall of the water-head 13, that is, that side wall having the ports 29, 30, 31 and 32 formed therein. To effect such connection of the formation or disc 34 to the water-head 13, such formation 34 is provided with a concentrically arranged internally screw threaded opening adapted to receive the externally screw threaded end 22 of the pivot pin 21 therein. Thus, by reason of the spring mounting of the pivot pin 21 in the water-head 13, that is, through the helical spring 25 bearing upon the headed portion 24 of the pin 23, said pivot pin may be caused to have an outward pull imparted thereto, and in consequence, insure positive and flush contact of the adjacent faces of the ported side wall of the water-head 13 and the disc-like formation 34. The pressure of these several elements upon each other, obviously, can be varied by adjustment of the tension of the helical spring 25.

A piston rod 37 is arranged longitudinally of the bore or chamber of the cylinder 33 and carries a piston 38 upon its upper end; the opposite ends of such cylinder being closed by heads of suitable size and shape indicated by the numerals 39 and 40. Bolts or other suitable fastening devices 41 are, of course, passed through these several heads 39 and 40 into engagement with portions of the cylinder 33, serving to secure the same in place. The cylinder head 40 is provided with a stuffing or packing band 42, through which the lower end or portion of the piston 37 extends, while a longitudinally disposed guide arm is rigidly secured in position adjacent the cylinder head 40 through the medium of those particular bolts 41 employed to secure the same in place upon its particular end of the cylinder 33. Oppositely disposed longitudinally extending grooves or channels 43 are formed throughout the length and in the opposite sides of the guide arm, indicated for the purpose of convenience by the numeral 44, and receive therein, wing-like extensions formed upon the outer sides of the lower end of such piston 37 and designated by the numeral 45. Also, this lower end of the piston 37 carries a laterally extending pin 46 adapted to have one end thereof passed through a portion of the disc 9 mounted upon the shaft 5, whereupon it is secured thereto through the medium of a lock nut or similar device 47.

I may and preferably do interpose between the contacting faces of the disc-like formation 34 and the ported side wall of the water-head 13, a bronze bearing or rubbing ring 48, whereby to take up the wear between the oscillating cylinder and the water-head.

In operation of my improved water pump, rotary motion is directed to the pulley wheel 6 through suitable means, causing the shaft 4 to be rotated and transmitting such rotary motion through the shaft 5 to the disc 9. Because of the crank-line or eccentric connection of the pin 46 to the disc 9, it will be understood that with rotation of said disc, a compound or rotary reciprocatory motion will be imparted to the piston rod 37. Because of the rotary movement, the cylinder 33 will be caused to oscillate upon the pivot pin 21. With rotation of the disc 9 in clock-wise fashion, as indicated by the arrow in the Figure 1, the piston 37 with

its piston 38 will travel downwardly in the cylinder 33. Simultaneously, the cylinder 33 will be oscillated, and brought to a position whereat the port 35 therein will be in exact registry with the inlet port 29 of the water-head 13, whereas the cylinder port 36 will be in exact registry with the discharge port 32 of said water-head 13. Water or other fliud is now moving into the passage way 14 through the port 16, which, of course, is connected to a suitable supply conduit, and is passing out of the way 15 through the port 17 thereof. When the cylinder 33 is at the limit of its opposite oscillatory movement, the same condition as respects the establishing of communication between the passage ways 14 and 15 of the water-head and the ports 35 and 36 of the cylinder 33 will be existent, except that the piston 38 is now travelling upwardly and the port 35 will be registered or alined with the port 31 of the water discharge way 15, while the port 36 will be registered or alined with the port 30 of the water inlet passage way 14. In this connection, it, of course, will be understood that the discharge port 17 of the water-head is connected with a suitable pipe or conduit in order that the discharge flow of water from the pump may be conveyed to the desired point.

When the cylinder 33 is at either end of its oscillatory movement, the piston 38 upon the rod 37 is moving at its maximum speed and hence, the ports should be in exact registry at this time, as is the case. Ports 35 and 36 of the cylinder 33 do not begin to become disalined or leave registry with the ports in the ported side wall of the water-head 13 until the piston speed has somewhat diminished.

To relieve the water being displaced by the improved pump from excessive air pressure, the air dome 19 is provided. In this connection, it, of course, will be appreciated that the water passing into the discharge passage way 15 may be under excessive air pressure and to relieve it of this pressure, communication with the air dome 19 is effected by way of the port 18. Thus, the surging of water on each stroke of the piston 38 within the cylinder 33 will be eliminated, and thereby a more even and uniform flow of water will be effected at the discharge port 17 of the water-head 13.

Manifestly, the construction shown is capable of considerable modification, and such modification as is within the scope of my claim, I consider within the spirit of my invention.

I claim:

A pump of the character described comprising, a supporting frame, a stationary water head having relatively opposed semi-circular inlet and outlet ways, inlet and outlet ports communicating with intermediate portions of the inlet and outlet ways respectively and extending radially therefrom, an auxiliary port at one end of the outlet way, an air dome supported upon the head and communicating with the auxiliary port, one side wall of the water head having pairs of juxtaposed inlet and outlet ports formed therein and communicating with the opposite extremities of said semi-circular ways, said water head having a concentrically arranged opening, an oscillatable cylinder having a socket alignable with said opening, a bearing pin extending through said opening and into the socket to connect the head and cylinder, said cylinder having inlet and outlet ports registerable at times with the ports in said water head, a reciprocable piston in said cylinder, and means mounted on said frame to effect reciprocation and oscillation of the piston and cylinder respectively.

In witness whereof I have hereunto set my hand.

MELVIN BERKSHIRE.