

P. J. STALEC.
HYDRAULIC IRRIGATING MACHINE.
APPLICATION FILED SEPT. 21, 1914.

1,171,758.

Patented Feb. 15, 1916.

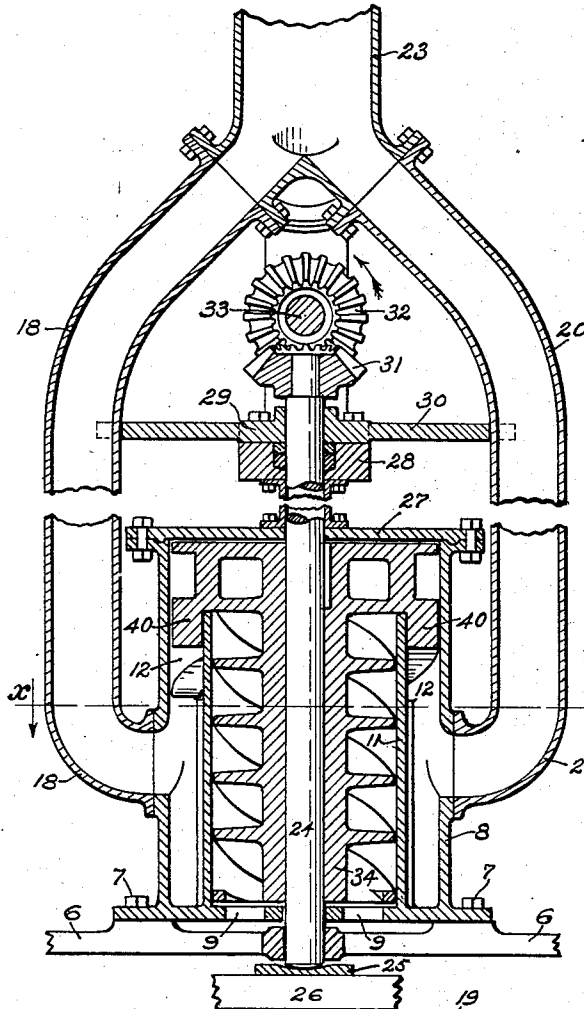


FIG. 1

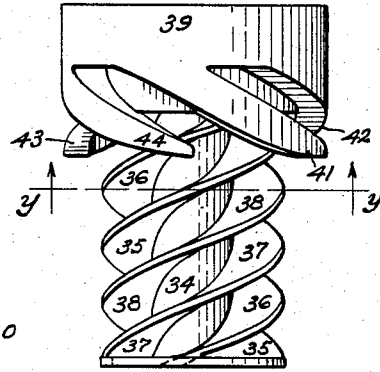


FIG. 3

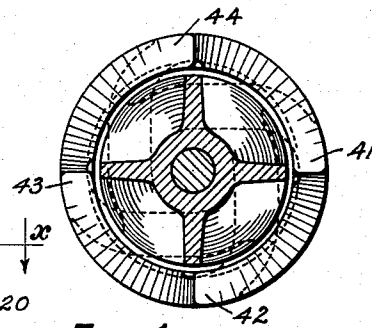


FIG. 4

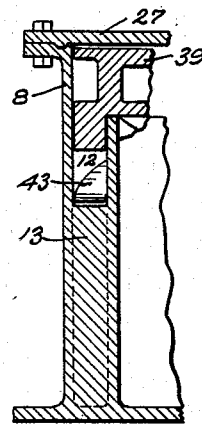


FIG. 5

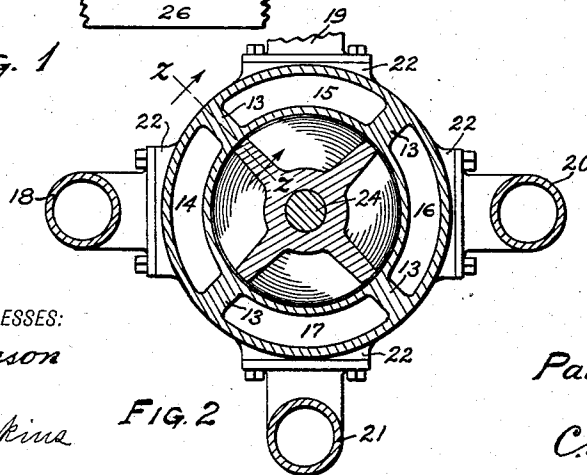


FIG. 2

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HYDRAULIC IRRIGATING-MACHINE.

1,171,758.

Specification of Letters Patent.

Patented Feb. 15, 1916.

Application filed September 21, 1914. Serial No. 862,665.

To all whom it may concern:

Be it known that I, PAUL J. STALEC, citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented a certain new and useful Improvement in Hydraulic Irrigating-Machines, of which the following is a specification.

My invention relates to improvements in hydraulic machines which are adapted for use in the operation for pumping water to raise such water to a higher level, and the object of my invention is to improve the hydraulic irrigating machine which is illustrated, described and claimed in my co-pending application Serial No. 833,193, filed by me in the United States Patent Office on date of April 20, 1914, for Letters Patent for hydraulic irrigating machine whereby there shall be provided a more direct passageway through which water may be forced to flow from the inlet opening through the machine to the discharge opening thereof and whereby with a given speed, a given quantity of water may be forced to a higher level.

I accomplish this object by devices illustrated in the accompanying drawings, wherein—

Figure 1 is a view in vertical mid-section of a structure embodying my invention; Fig. 2 is a view in horizontal section on broken line *x, x* of Fig. 1; Fig. 3 is a view in side elevation of a detail of my invention; Fig. 4 is a view in horizontal cross-section on broken line *y, y* of Fig. 3, illustrating such detail, and Fig. 5 is a view in vertical radial section on broken line *z, z* of Fig. 2, of another detail of my invention.

Referring to the drawings, throughout which like reference numerals indicate like parts, 6 and 6 indicate fragments of two of four radial arms of a base frame upon which is secured by bolts 7 the flange portion of the bottom end of a rotary pump cylinder 8 whose bottom wall is provided with four openings 9 of segmental form which are disposed concentrically with the axis of said cylinder and which open into the space between adjacent ones of said four radial arms through which openings 9 water may pass into the interior of said cylinder. Within said cylinder is a concentrically disposed tube 11 which extends upwardly from the bottom wall of said cylinder, with which it is integrally connected, for a distance equal approximately to four fifths of the interior

vertical dimensions of said cylinder said tube 11 being of such diameter to encircle the four segmental openings 9 and to provide an annular space 12 between the exterior periphery of said tube 11 and the inner surface of the wall of the cylinder 8, and within such annular space 12 are vertically disposed four partitions 13, equidistant from each other, which extend upwardly for a distance equal to a little more than half the interior vertical dimension of said cylinder to divide the lower portion of such annular space 12 into four parts 14, 15, 16 and 17, connecting with each of these four parts is a passageway through the wall of the cylinder leading through conducting pipes 18, 19, 20 and 21, respectively, which conducting pipes are secured to bosses 22 on the exterior wall of said cylinder by a flange joint, as more clearly shown in Fig. 2, and these conducting pipes 18, 19, 20 and 21 turn to extend upwardly for any desired distance above the cylinder 8 and are there all connected to a common conducting pipe 23 which may lead to any desired point for the delivery of water at such point, or each of such conducting pipes 18, 19, 20, and 21 may lead to different points for the distribution of water.

Concentrically disposed to extend vertically through the cylinder 8 is a shaft 24 whose lower rounded end rests upon a step bearing 25 which is supported upon a plate 26 that is vertically adjusted by means not shown, but which means are disclosed in Fig. 1 of the drawings forming a part of my said co-pending application and the surrounding surface of the lower end portion of said shaft 24 is journaled in bearings formed in the base frame 6 and the bottom wall of the cylinder 8, while the top cylinder-head 27 is provided with a concentric hole through which the shaft 24 extends upwardly into and through a packing box 28, thence to extend upwardly to and through a bearing 29 which is supported by four radial arms 30 each of which extends to and is secured to a different one of the conducting pipes 18, 19, 20 and 21 and thence to extend upwardly to terminate at such distance above the bearing 29 as will afford a length sufficient for disposing upon its end portion a beveled gearwheel 31 which is securely fastened thereon, which beveled gearwheel 31 meshes with another gearwheel 32 which is securely mounted on a horizontal shaft 33 which is disposed to be rotatable in suitable

bearings, not shown, and with which shaft 33 may be associated power driven mechanism for rotating such shaft 33 to rotate the shaft 24.

5 Upon the shaft 24 within the cylinder 8 is mounted securely a fin-screw conveyer comprising a hub 34 from which project four spirally disposed fins 35, 36, 37 and 38 which are spaced equal distances apart and
10 whose outer edges fit closely to the inner surface of the tube 11, the upper end portion 39 of such hub 34 being enlarged to a diameter to adapt such upper end portion to fit closely to the wall of the cylinder 8
15 such upper end portion 39 being formed to have an annular portion 40 extend downwardly to fit within the annular space 12 between the tube 11 and the wall of the cylinder 8, the top end surface of said enlarged portion 39 being disposed close to the under surface of the top cylinder head
20 27 and projecting from the bottom part of the annular portion 40 are four spiral arms 41, 42, 43 and 44 which extend spirally
25 in a direction opposite to the diameter of the spiral fins 35, 36, 37 and 38 and within such enlarged portion 39 are passageways, indicated by dotted lines in Fig. 4, each of which leads from a space between adjacent
30 ones of the fins 35, 36, 37 and 38 into the respective space between adjacent ones of the four spiral arms 41, 42, 43 and 44 and within the cylinder the tip ends of the four arms 41, 42, 43 and 44, as they are revolved,
35 are disposed just to clear the top end surfaces of the four partitions 13, as indicated more clearly in Fig. 5, thus water may find passageway through four separate paths, which passageways extend through the
40 openings 9, thence through the spaces between adjacent ones of the fins 35, 36, 37 and 38, thence through the respective passageways in the end portion 39, thence into the respective passageways between the adjacent ones of the four spirally disposed
45 arms 41, 42, 43 and 44, thence into the respective segmental parts 14, 15, 16 and 17 of the annular space 12, thence outwardly into the respective conducting pipes 18, 19,
50 20 and 21, thence upwardly into the conducting pipe 23, and thus when the shaft 33 is rotated in the direction of the arrow the hub 34 will be rotated in a direction whereby the fins 35, 36, 37 and 38 will carry water
55 upwardly as it flows inwardly through the openings 9 and force such water into and through the passageways within the enlarged portion 39, thence downwardly between the arms 41, 42, 43 and 44 to force
60 such water through the segmentally formed spaces 14, 15, 16 and 17 to cause such water to flow outwardly and upwardly in the conducting pipes 18, 19, 20 and 21 and thence

upwardly through the pipe 23 to the point of discharge; all of such passageways affording less resistance to the flow of water through them than do the passageways through the machine illustrated and described in my co-pending application, whereby a machine embodying my present
70 invention, as I have found in actual practice is very much more efficient than the machine shown and described in my said co-pending application.

What I claim is:

75 In a hydraulic machine of the class described, the combination with a pump cylinder having inlet passageways through its bottom end wall and having a plurality of outlet passageways through its side wall, 80 said outlet passageways being equi-distant from each other, of discharge pipes each connected with a different one of said outlet passageways, a tubular formed portion disposed concentrically within said cylinder 85 to encircle said openings in the bottom wall of said cylinder, with which bottom wall said tubular portion is integrally connected whereby is formed an annular space between the exterior of said portion and the interior 90 surface of the side walls of said cylinder; a plurality of partitions disposed each within said annular space between adjacent ones of said outlet openings to extend from said bottom end wall of said cylinder to a plane 95 higher than said outlet passageways, a shaft rotatably disposed to extend concentrically through said cylinder; a hub secured on said shaft within said cylinder to extend throughout the length thereof said hub having its upper end portion enlarged to fit within the upper end portion of the boring of said cylinder said enlarged end portion having an annular flange which extends downwardly within the upper portion of the 105 annular space between said tubular portion and the wall of said cylinder; a plurality of spirally disposed arms integrally secured to the bottom surface of said annular flange which arms extend downwardly to a plane 110 adjacent to the top end surfaces of said partitions, a plurality of spirally disposed fins secured integrally to the periphery of that portion of said hub that is surrounded by said tubular portion, and passageways 115 within said enlarged portion of said hub for connecting respectively the spaces between adjacent ones of said fins with the spaces between said spirally disposed arms.
In witness whereof, I hereunto subscribe
my name this eighth day of September.
A. D. 1914.

PAUL J. STALEC.

Witnesses:

O. JOHNSON,
A. HASKINS.