

No. 643,150.

Patented Feb. 13, 1900.

G. W. MCGILL.
PUMPING MECHANISM.
(Application filed May 1, 1899.)

(No Model.)

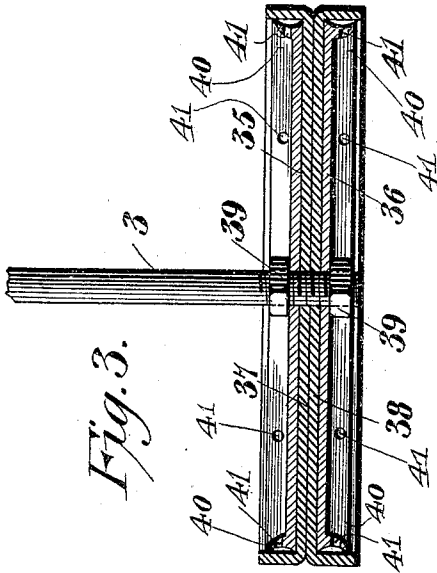


Fig. 3.

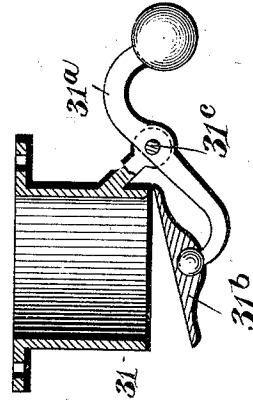


Fig. 2.

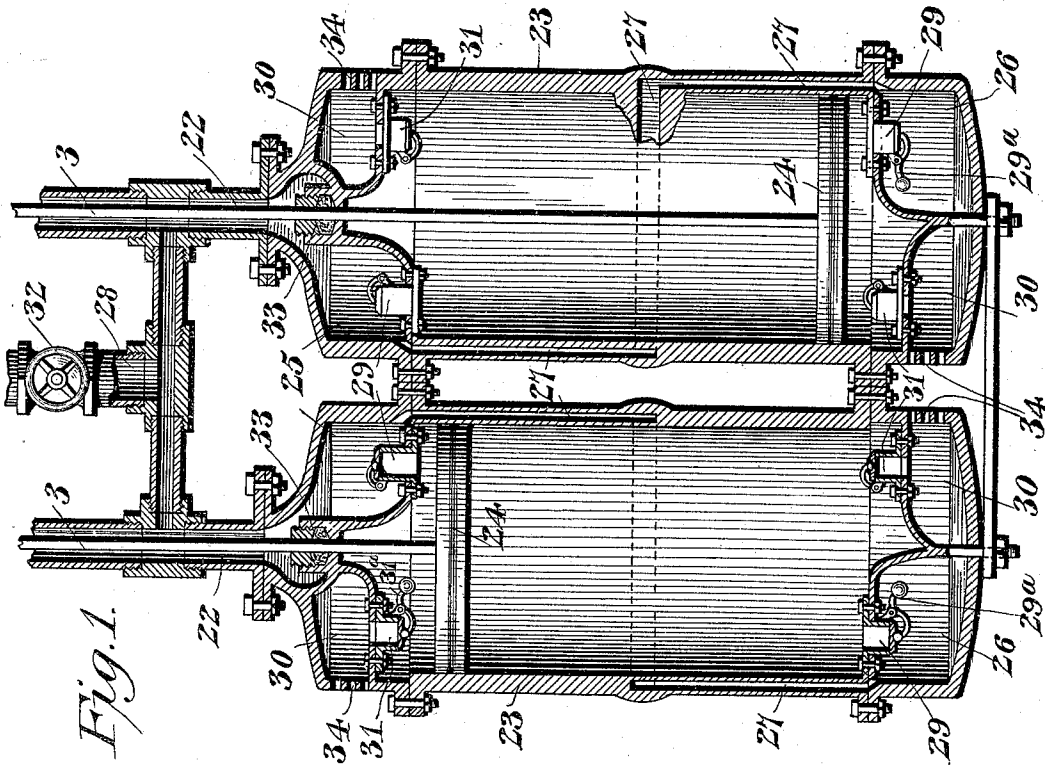


Fig. 1.

Witnesses

James L. McLachlan
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By his Attorneys,

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UNITED STATES PATENT OFFICE.

GEORGE W. MCGILL, OF KEARNEY, NEBRASKA.

PUMPING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 643,150, dated February 13, 1900.

Application filed May 1, 1899. Serial No. 715,186. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. MCGILL, a citizen of the United States, residing at Kearney, in the county of Buffalo and State of Nebraska, have invented a new and useful Pumping Mechanism, of which the following is a specification.

My invention relates to pumping mechanism, and particularly to a pump shown and described in a copending application filed by me of even date herewith; and the object in view is to provide a simple, compact, and efficient construction and arrangement of inlet and outlet valves and conveyers, whereby during the operation of the pump-plungers a continuous flow of liquid may be maintained with a minimum expenditure of power.

Further objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a vertical central sectional view of a pump constructed in accordance with my invention. Fig. 2 is a detail sectional view of one of the pump-cylinder ports and its controlling-valve. Fig. 3 is a detail sectional view of one of the pump-pistons.

Similar reference-numerals indicate corresponding parts in all the figures of the drawings.

In the construction illustrated the pump-cylinders 23, in which operate the plungers 24, communicate at opposite ends with the discharge-chambers 25 and 26, which are in communication by means of a passage 27, formed in the wall of each cylinder. One of these terminal discharge-chambers is in communication with a conveyer 22, through which extends the plunger-stem 3, a stuffing-box 33 being located in the head of each cylinder for the passage of such stem. In turn said conveyer communicates with a distributing-pipe 28, which in practice is preferably provided with a controlling-cock or cut-off 32. Said discharge-chambers 25 and 26 are formed in the opposite heads of each cylinder, but occupy only a portion of the space within said heads, and separated from said chambers by suitable partitions are inlet-chambers 30, provided in their outer walls with supply-ports

34 and communicating with the interior of the cylinder by means of inlet-ports fitted with inlet-valves 31. The inlet-valves, as illustrated in the drawings, are of the clack variety, being held to their seats by gravity and being arranged to open inwardly or toward the cylinder. To insure the automatic closing of the inlet-valve at the upper end of the cylinder, I preferably provide it with a weighted arm 31^a. The discharge-chambers are in communication with the interior of the cylinder by means of outlet-valves 29, which are also of the clack variety and are preferably constructed to close by gravity that outlet-valve which is located at the lower end of the cylinder, and hence which opens outwardly, being provided with a weighted arm 29^a.

The inlet and the exhaust chambers are separated from the cylinder by horizontal partitions located at different relative levels and in which are formed vertical openings controlled by the valves 29 and 31. The horizontal partitions forming the inlet-chambers 30 are located nearer the end closures or heads of the cylinders, whereas the horizontal partitions of the chambers 25 and 26 are arranged more remote from said heads. This disposition of the horizontal partitions brings the valves 29 and 31 at each end of the cylinder in the same horizontal plane and enables the cylinder to be of minimum length compared with the stroke of the piston. The stuffing-box 33 is located within the upper end of the cylinder at the juncture of the inner curved ends of the horizontal partitions and does not interfere with the outflow of the water from the chamber 25 to the conveyer 22.

In practice I prefer to arrange the pump-cylinders in duplicate, and in connection with the pump it is my object to employ an operating mechanism whereby the plungers may be reciprocated to cause simultaneous movement in opposite directions thereof. Each cylinder, however, is of double-acting construction in that during the movement of the plunger in one direction there is a discharge of liquid from the portion of the cylinder above the plunger through the upper outlet-valve into the upper discharge-chamber 25, and at the same time there is an inlet of water from the chamber 30 at the lower

end of the cylinder to the portion of the cylinder below the plunger. Upon the return or downward stroke of the plunger water is supplied to the cylinder above the plunger through the port controlled by the upper inlet-valve, while the water below the plunger is discharged into the lower discharge-chamber 26 through the communicating passage 27, which is formed in the wall of the cylinder, into the upper discharge-chamber 25, and thence to the service-pipe.

The means whereby the plungers are reciprocated forms no part of my present invention, but is shown and illustrated in my co-pending application above mentioned.

In order to insure the efficient seating of those port-controlling valves which are provided with weighted arms, I preferably construct the same as indicated in detail in Fig. 2, wherein the valve-disk 31^b is hinged to rock upon the inner extremity of the weighted arm, said arm in turn being pivotally mounted, as at 31^a.

The pump-plunger consists of spaced upper and lower disks 35 and 36, in connection with which are arranged relatively-inverted packing-cups 37 and 38, facing in opposite directions and arranged with their body portions between said disks and held firmly in place by means of upper and lower binding-nuts 39. The disks 35 and 36, which are preferably of metal, are provided with peripheral outwardly-extending ribs or flanges 40, of which the outer surfaces are concaved or channeled, facing the peripheral flanges of the packing-cups, and in these ribs and communicating with said peripheral channels of the metal disks are openings 41 for communicating pressure upon either side of the plane of the plunger to the interior of the channel to effect the expansion of the packing-cup. It will be understood that the packing-cups by this arrangement are alternately expanded, and each packing-cup is expanded and allowed to retract, respectively, upon the movements in opposite directions of the piston.

It will be understood that in practice va-

rious changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the present invention.

Having thus described the invention, what is claimed is—

1. In a pump, the combination of a cylinder, horizontal partitions subdividing the ends of the cylinder into non-communicating inlet and discharge chambers, said partitions being disposed at different relative elevations and having vertical openings, the inlet-chambers having supply-ports, a passage connecting the discharge-chambers at opposite ends of the cylinder, a distributing-pipe in communication with one of said discharge-chambers, and inlet and outlet valves located upon opposite sides of the horizontal partitions in about the same horizontal plane and controlling the vertical openings formed in the respective partitions, substantially as specified.

2. The combination with a cylinder having a centrally-disposed discharge-opening in one head, horizontal partitions subdividing the discharge end of the cylinder into inlet and discharge chambers, the latter having communication with the discharge-opening of the cylinder-head, and the former having an inlet-port, said partitions being in different relative planes and formed with vertical openings, valves in the same horizontal plane and arranged upon opposite sides of the respective horizontal partitions, a stuffing-box located within the cylinder and supported by the inner ends of said partitions, and a piston having its rod passing through the stuffing-box and the discharge-opening in the head of the cylinder, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE W. MCGILL.

Witnesses:

JOHN H. SIGGERS,

FRANCES PEYTON SMITH.