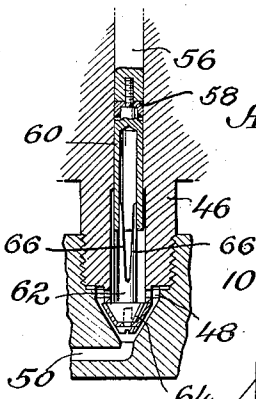
Feb. 25, 1930. J. P. McBRIDE 1,748,782

PUMP

Filed Oct. 6, 1928

Fig. 4.



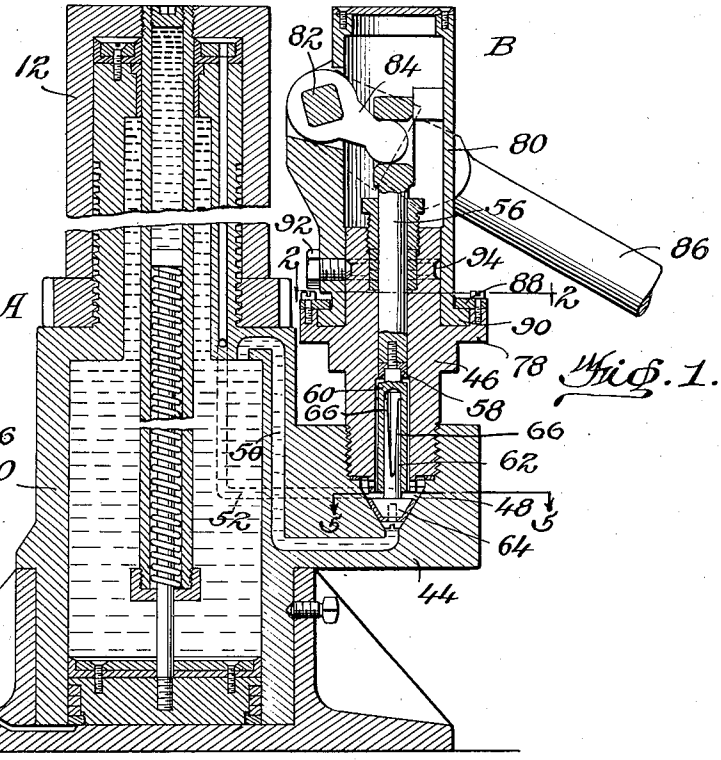


Fig. 1.

Fig. 2.

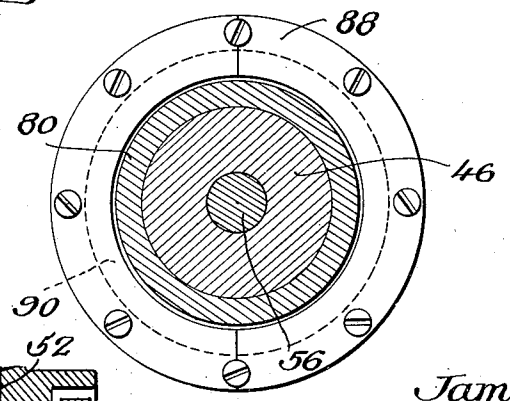
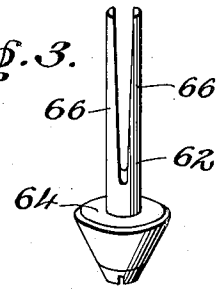


Fig. 3.



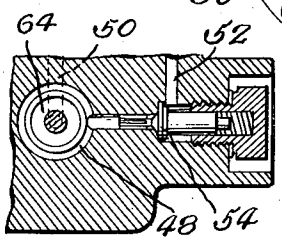


Fig. 5.

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Patented Feb. 25, 1930 1,748,782

UNITED STATES PATENT OFFICE

JAMES P. McBRIDE, OF NEW YORK, N. Y., ASSIGNOR TO MUNKE JACK CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

PUMP

Original application filed November 9, 1927, Serial No. 232,028. Divided and this application filed October 6, 1928. Serial No. 310,822.

My invention relates to pumps and particularly to a type adapted for use in the operation of the hydraulic jack disclosed and claimed in my prior application #232,028, and of which this application is a division.

It is the purpose of my present invention to provide a pump which, when used as a component part of the hydraulic jack disclosed in my prior application, will efficiently transfer liquid from one location to another for the purpose of projecting the ram member of the jack, and in which such efficiency will be maintained regardless of the load being elevated by the jack.

Specifically, it is my purpose to provide an improved construction of pump wherein the valve element which controls the supply of liquid to the pump is directly operated to open and closed positions by relative movement of certain parts of the pump structure, as distinguished from those pump valve elements which are operated by flow of liquid resulting from suction or pressure applied thereto by operation of the pump piston alone.

Furthermore, it is the purpose of my invention to provide a pump of the type specified wherein the operating handle of the pump may be rotated to and operated in any position about the longitudinal axis of the pump.

My inventive idea is capable of embodiment in different mechanical structures one of which is shown in the accompanying drawings. It is to be understood, however, that the structure shown is intended merely as a disclosure of the essential features and novel characteristics of my invention in one preferred form and that various changes and desirable additions may be made in and to the same within the spirit and scope of my invention as defined in the appended claims.

In the drawings, wherein like characters of reference denote corresponding parts in the different views—

Fig. 1 is a vertical section through my improved pump sliowing same operatively connected with a jack of the type disclosed in my aforesaid prior application;

Fig. 2, a horizontal section on the line 2—2 of Fig. 1;

Figure 3, a perspective view of piston operated valve element of my pump;

Figure 4, a detail section showing the piston moved outward and the piston operated valve in open position; and

Fig. 5, a section on the line 5—5 of Fig. 1.

Referring to the drawings in detail, A indicates generally a hydraulic jack of the type described and claimed in my copending application 232,028, and B my improved pump in operative association with said jack.

In respect to the structural features of the jack it is deemed sufficient for this application to merely point out that it includes a housing 10 and a ram member 12 slidable on said housing, the latter being projected through the medium of my improved pump B which, for this purpose, transfers liquid from within the housing to between the upper ends of the housing and ram member through duct 50, recess 48 and duct 52.

An extension 44 projects laterally from the jack housing and has threadedly engaged therewith a pump cylinder 46 the inner end of which opens into the inwardly tapering valve receiving recess 48 formed in said extension. The duct 50 provides communication between the inner end of recess 48 and the interior of the jack housing. Duct 52 leads from the recess 48 through the jack housing to the space between the upper ends of the housing and ram member, said duct being provided with the necessary check valve 54.

The outer portion of the bore of pump cylinder 46 is of slightly smaller diameter than the inner portion thereof, and reciprocal in the outer, smaller bore portion is a packed piston 56 equipped at its inner end with a cup gasket 58 secured thereto by an extension 60 of said piston which has detachable, screw-threaded connection therewith. Extension 60 preferably is of less diameter than the diameter of the inner portion of the bore of the pump cylinder to provide a space around said extension affording communication between the outer portion of the pump cylinder, within which piston 56 operates,

and the recess 48. Said extension 60 moreover is tubular and open at its inner end and has slidably fitted therein the stem 62 of a tapered valve 64 which is faced with leather or other suitable material and is adapted to seat against the tapered wall of the recess 48 between the ducts 50, 52.

The stem 62 of valve 64 is split longitudinally as best shown in the detail view, Fig. 3, to provide a pair of resilient tongues 66 adapted frictionally to engage the inner face of tubular extension 60 so that said valve is both movable with and in respect to said extension. As a consequence of this arrangement when piston 56 and its extension 60 are moved outward valve 64 will be moved outward with the extension 60, away from its seat until its outer end strikes the inner end of pump cylinder 46 or any other suitable abutment, when its outward movement will be arrested while the piston and its extension continue to move outward. In this way valve 62 is moved positively to open position directly by the piston. On the other hand, when piston 56 and its extension 60 are moved inward, valve 64 is moved to its seat during a small initial amount of such inward movement, and being arrested by its seat, continued inward movement of the piston results merely in the extension 60 sliding over the stem 62, or, in other words, telescoping movement of the stem 62 with respect to the extension 60. Thus it is apparent that the arrangement described results also in the valve being moved positively directly by the pump piston to closed position.

Furthermore, it will be noted that the arrangement and construction of the extension 60 and valve stem 62 is such that during the intake stroke of the pump the split of the stem 62 is uncovered, allowing liquid supplied to the pump to enter the recess in the extension 60. Upon the following ejection stroke of the pump the stem 62 of the valve will reenter the recess of extension 60 and force liquid therefrom, and thus the valve 64 and stem 62 are not only positively operated to control the duct 50, but also to force liquid from the pump during its ejection stroke and thus increasing the capacity of the pump over that which would exist if the extension 60 were solid and the valve 64 merely suction operated.

A laterally and upwardly directed flange 78 on the pump cylinder 46 provides a seat which rotatably receives the lower end portion of a cylindrical casing 80 in one side of which is journaled a horizontal shaft 82 having fixed thereto an arm 84 operatively connected with the upper end of piston 56, whereby oscillation of said shaft reciprocates said piston, an actuating handle 86 being connected with said shaft for oscillating same. A ring 88 secured to the flange 78 and overlying a lateral flange 90 at the lower end of the casing 80 serves to establish a swivel connection between the pump cylinder and said casing, while a bolt 92 threaded in said casing with its inner end disposed in an annular groove 94 in the pump cylinder cooperates with said swivel connection to prevent outward movement of the casing and also provides means when tightened to lock the casing in any desired rotatably adjusted position with respect to the pump cylinder. When bolt 92 is loosened the casing 80 with the handle 86 obviously may be rotated to dispose the handle in different positions with respect to the jack proper for most convenient operation. The casing 80 moreover is closed at its upper end and serves as a protective covering for the pump piston.

I claim:

1. In a pump structure of the class described, a pump body having an inlet and outlet, a piston reciprocal in said body, a valve controlling said inlet and having a reduced stem in frictional slidable engagement with the wall of a recess which latter opens only through the adjacent end of the piston whereby the stem of said valve will be moved into and out of the recess in the piston by engagement of the valve with the pump body during reciprocation of the piston, and means for admitting liquid into the piston recess during movement of said stem out of the recess and permitting discharge of said liquid from the recess during movement of the valve stem into the recess.

2. In a pump structure of the class described, a pump body having an inlet and outlet, a piston reciprocal in said body, a valve controlling said inlet and having a reduced stem in frictional slidable engagement with the wall of a recess which latter opens only through the adjacent end of the piston whereby the stem of said valve will be moved into and out of the recess in the piston by engagement of the valve with the pump body during reciprocation of the piston, and means for admitting liquid into the piston recess during movement of said stem out of the recess and permitting discharge of said liquid from the recess during movement of the valve stem into the recess, said means comprising a furcation of the valve stem which is uncovered during the movement of said stem out of said piston recess.

In testimony whereof I hereunto affix my signature.

JAMES P. McBRIDE.