

Filed June 1, 1954

PORTABLE PUMP

2 Sheets-Sheet 1

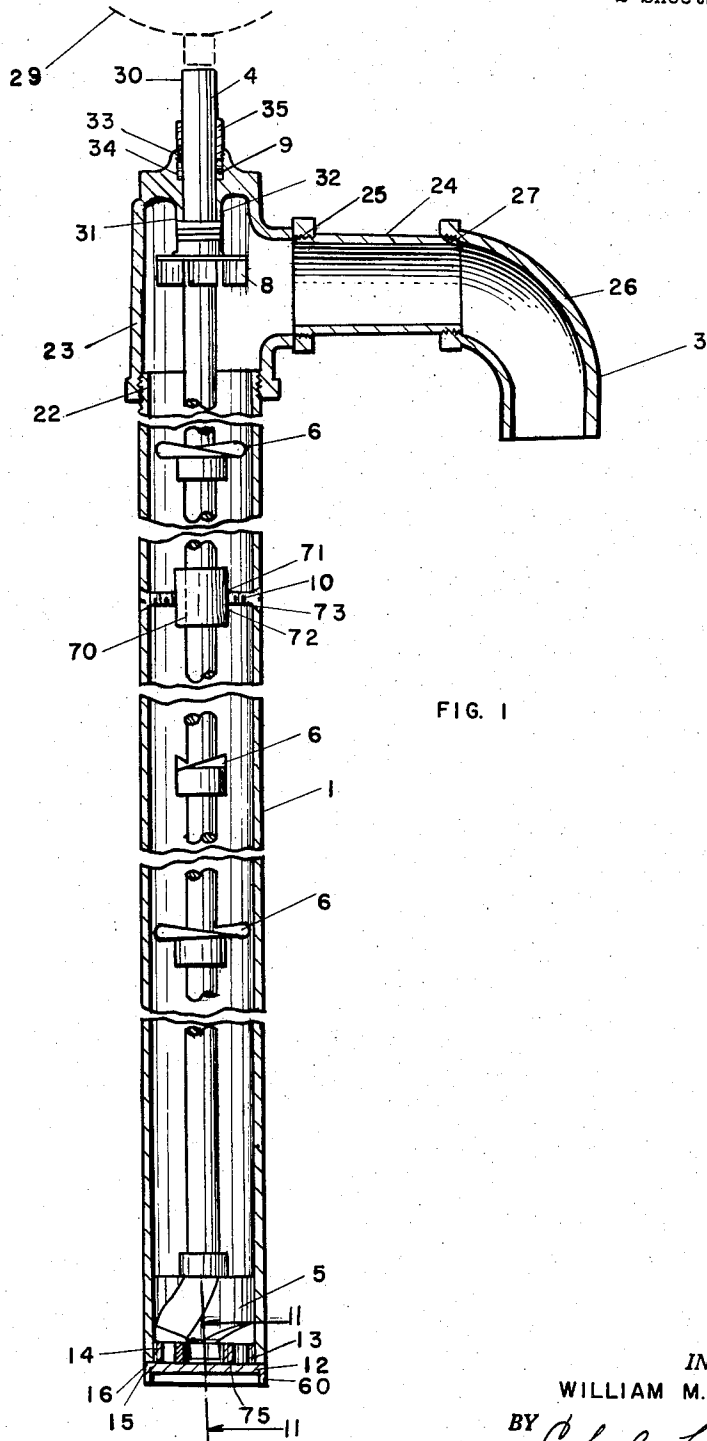


FIG. 1

INVENTOR.
WILLIAM M. THOMPSON
BY *Charles L. Lorenschek*
attorney

April 14, 1959

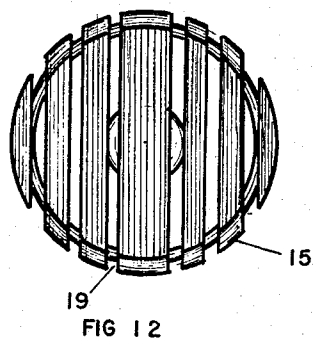
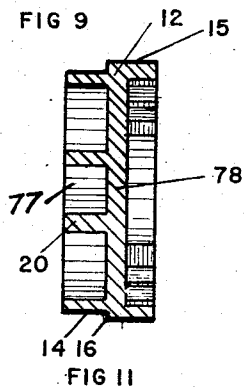
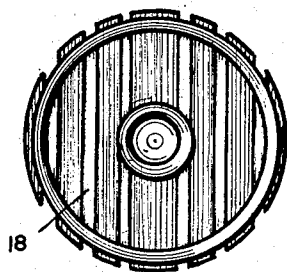
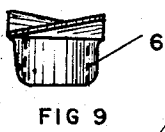
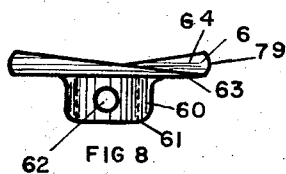
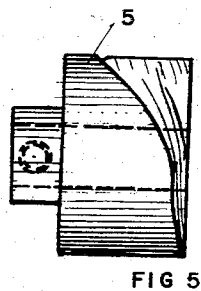
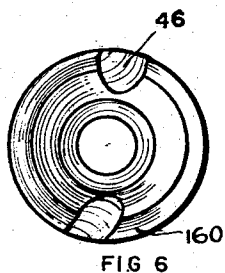
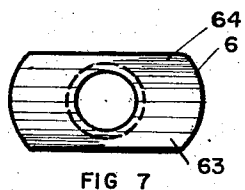
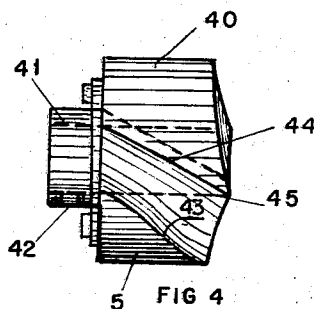
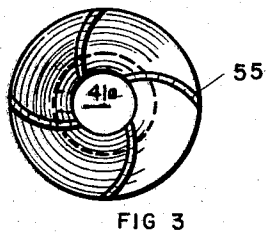
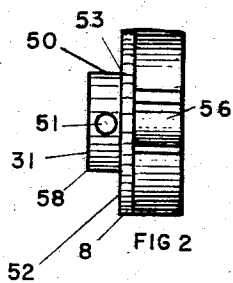
W. M. THOMPSON

2,881,707

PORTABLE PUMP

Filed June 1, 1954

2 Sheets-Sheet 2



WILLIAM M. THOMPSON

Inventor

By

Charles L. Lorsch

Attorney

1

2,881,707

PORTABLE PUMP

William M. Thompson, Erie, Pa., assignor to Thompson Manufacturing Company, Inc., Erie, Pa., a corporation of Pennsylvania

Application June 1, 1954, Serial No. 433,602

3 Claims. (Cl. 103—88)

This invention relates to pumps and more particularly to pumps suitable for lifting liquids from one elevation to another such as in pumping the liquid contents from a barrel.

In pumps made according to previous designs and with which I am familiar, the body of the pump was usually of a large diameter so it was not possible to insert it through the bung hole of a barrel in order to pump the contents from the barrel. Further, these prior pumps frequently had bearings which were immersed in the liquid itself and the bearings were frequently attacked by abrasive action due to substances suspended in the liquids being pumped and corrosive action on the bearings by the liquids themselves.

It is, accordingly, an object of my invention to overcome the above and other defects in prior pumps and it is more particularly an object of my invention to provide a pump which is simple in construction, economical to manufacture, and simple and efficient to use.

Another object of my invention is to provide a pump wherein the body thereof has a relatively small diameter suitable for being inserted through the bung of a barrel whereby the contents of the barrel may be pumped out.

A further object of my invention is to provide a pump which will pump a liquid from a level below the outlet of the pump and deliver the stream with appreciable force.

With the above and other objects in view, the present invention consists of the combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportions, and minor details of construction without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:

Fig. 1 is a transverse cross sectional view of the pump according to my invention;

Figs. 2 and 3 are enlarged views of one of the impellers of the pump;

Figs. 4, 5, and 6 are views of another impeller of the pump;

Figs. 7, 8, and 9 are views of a propeller type impeller used in the pump;

Figs. 10 and 12 are views of the inlet member of the pump; and

Fig. 11 is a cross sectional view of the inlet member taken on line 11—11 of Fig. 1.

Now with more specific reference to the drawings, I show a pump having a body 1, an inlet 12, and a discharge spout 3. A shaft 4 is preferably driven by a motor 29 and has a cylindrically shaped inlet prime compression unit 5, booster propeller 6, and a discharge impeller 8 attached to rotate therewith. The shaft 4 rotates in packing gland 9 and is supported intermediate thereof by means of the screws 10 which threadably engage the collar 70. Shaft 4 freely rotates in a bore through the collar 70 and the collar 70 and screws 10

2

act as a steadying means for the intermediate section of the shaft 4 in order to reduce vibration thereof. The heads of the screws 10 rest on the inclined surface of the holes 73.

The body 1 is in the form of a pipe, for example, a pipe of one and one-half to two inches in diameter, and since no obstruction extends outward from the pipe, the pipe is suitable for being inserted through a small opening. The pipe 1 has the inlet member 12 attached to the lower end thereof at 13. The inlet member 12 has a reduced size upwardly extending flange portion 14 which fits into the lower end of the pipe 1 and the enlarged portion or flange 15 forms a shoulder 16. The reduced size portion 14 fits into the lower end of the pipe 1 and the lower end of the pipe rests on shoulder 16. A web 78 extends inside the flange 15. Transverse slots 18 are cut across the web 78 of the inlet member 12 and extend out through the flange 15 thereof at 19. A hollow boss member 20 has a centrally located hole 77 to receive the lower end of shaft 4 to form a guide for the lower end thereof and the end 75 of the boss 20 may form a support for the lower end of the prime compression unit 5.

The upper end of the body member 1 is attached to the head 23 by threadably engaging it at 22. An outlet member comprising the spout 3 made up of a tube 24 threadably engaging the head 23 at 25 and an elbow 26 threadably engaging the tube 24 at 27 may be provided. The motor 29 may be coupled to the shaft 4 at 30 to drive the shaft 4 and the upper portion of the shaft 4 has the outlet impeller 8 secured thereto by means of a set screw in hole 51. The impeller 8 forms a shoulder at 31 to engage the boss 32 on the head member 23 to positively locate the shaft 4 between the boss 32 and the boss 20 on the inlet member 12. The packing gland 9 is made up of the bore 33 in the head 23 which has the packing 34 inserted therein and has the packing nut 35 engaging the threaded end of the bore 33, forcing it into engagement with the packing 34 to squeeze the packing therein into sealing engagement with the shaft 4.

The prime compression unit 5 shown in Figs. 4, 5, and 6 has the body portion 40, a bore 41 extending therethrough to receive shaft 4, and a threaded hole 42 for receiving a set screw to engage the shaft 4 to lock prime compression unit 5 on shaft 4. The prime compression unit 5 has the spirally curved passages 43 formed therein which are inclined upwardly in a curved manner at 44, decreasing in cross sectional area and from inlet to outlet and terminating in a reduced size portion at the upper end thereof at 46. As the prime compression unit 5 rotates, driven by shaft 4, the periphery thereof runs in close proximity to the inside edges of the tubular body member 1 and forms closed passages with the peripheral edges thereof. Therefore, the lower lip 45 picks up the liquid and crowds it upwardly through the upwardly curving passages 43 to discharge into the pipe 1 thereabove. Since there is a component of force of the liquid against the upwardly curving surface 44 and since the passage between lip 45 and open 46 decreases in size in an upward direction, the liquid is generally compressed thereagainst as it is pushed upward and, therefore, given a greater velocity.

The intermediate vanes or propellers 6 are generally in the shape of fan or propeller blades having the outer edges thereof rounded at 79 in order to form less resistance on the liquid as they rotate therein. The propeller members 6 have body members 60 and bores 61 are formed therethrough for receiving shaft 4. Threaded openings 62 are provided for receiving threaded set screws or the like. The set screws lock the propellers to the shaft 4. The leading edge 63 is curved downward and the trailing edge 64 of each blade is curved upward so

3

that the liquid is urged in an upward direction as the propellers 6 rotate.

The discharge impeller 8 has the bossed portion 50 bored at 41a to receive the shaft 4 and has a threaded set screw opening 51 to receive a set screw to lock the impeller 8 to the shaft 4. A disk shaped impeller supporting portion 52 is attached to the boss portion 50 at 53 and the outwardly curving radially extending vanes 55 are integrally attached to the disk 52 at 56 to centrifugally discharge fluid outward from shaft 4. The vanes 55 extend outwardly from the shaft 4 and downwardly from the support 52.

In operation, the motor 29 is connected to a suitable supply of electric power and the body member 1 is inserted through an opening into a container with the lower flange 15 of the inlet member 12 resting on the bottom surface of the container. The motor 29 is then started and the lower leading edges 45 of the prime compression unit 5 draw liquid through slots 18 and 19 and drive it upwardly through the upwardly curving passages 45. The liquid will be urged through the pipe 1 by means of the intermediate propellers 6 and the discharge impeller 8 will engage the liquid and impart an additional velocity to the liquid as, by centrifugal force, it drives the fluid through the spout 3. It will be seen that liquid is drawn through breather slots 19 and is somewhat compressed in the converging edges 43 and 44 of the compression unit.

In the foregoing specification I have set forth the invention in its preferred practical forms but I am aware that the structure shown is capable of modification within a range of equivalents without departing from the invention which is to be understood is broadly novel as is commensurate with the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A portable pump for disposing in a small opening comprising an elongated tubular body member, an inlet member comprising an enlarged flange and a reduced size flange, a web disposed between said flanges, said reduced size flange disposed in one end of said tubular body member supporting said inlet member thereto, slots disposed parallel to each other through said web and opening therethrough, said enlarged flange forming commu-

4

nication passages from outside said tubular body member to the space therein, means in said tubular body member to force liquid through said slots and through the body of said pump to a discharge port thereof, said means to force liquid through said tubular body member comprising a head member on said tubular member, a shaft journaled at one end thereof in said head member attached to said tubular member and supported at the other end thereof on said inlet member, and a prime compression unit comprising a cylindrical member having spiral grooves disposed in the periphery thereof and leading from one end thereof to the other, said spirally curved grooves decreasing in cross sectional area from bottom to top, and terminating at the bottom edge thereof in curved lip portions, said web being substantially tangent to said curve of said lip portions, said lip portions being adapted to pick up liquid from said inlet member and force said liquid through said body member.

2. The pump recited in claim 1 wherein said shaft has a centrifugal impeller attached to the upper end thereof adjacent said pump discharge said centrifugal impeller having radially extending curved vanes disposed on said shaft adjacent the outlet to said body.

3. The pump recited in claim 1 wherein said shaft has a propeller shaped impeller disposed at a spaced point between said impeller and said prime compression unit.

References Cited in the file of this patent

UNITED STATES PATENTS

1,167,047	Chapman	Jan. 4, 1916
1,245,806	Sears	Nov. 6, 1917
1,554,472	Ulmann	Sept. 22, 1925
1,558,417	Vaughan	Oct. 20, 1925
1,912,575	Fonville	June 6, 1933
2,226,180	Emerick	Dec. 16, 1941
2,614,501	Baker	Oct. 21, 1952
2,647,366	McCann	Aug. 4, 1953

FOREIGN PATENTS

12,101	Great Britain	of 1913
285,531	Great Britain	Feb. 20, 1928
518,915	France	Jan. 12, 1921
584,395	Great Britain	Jan. 14, 1947
806,635	Germany	July 9, 1951