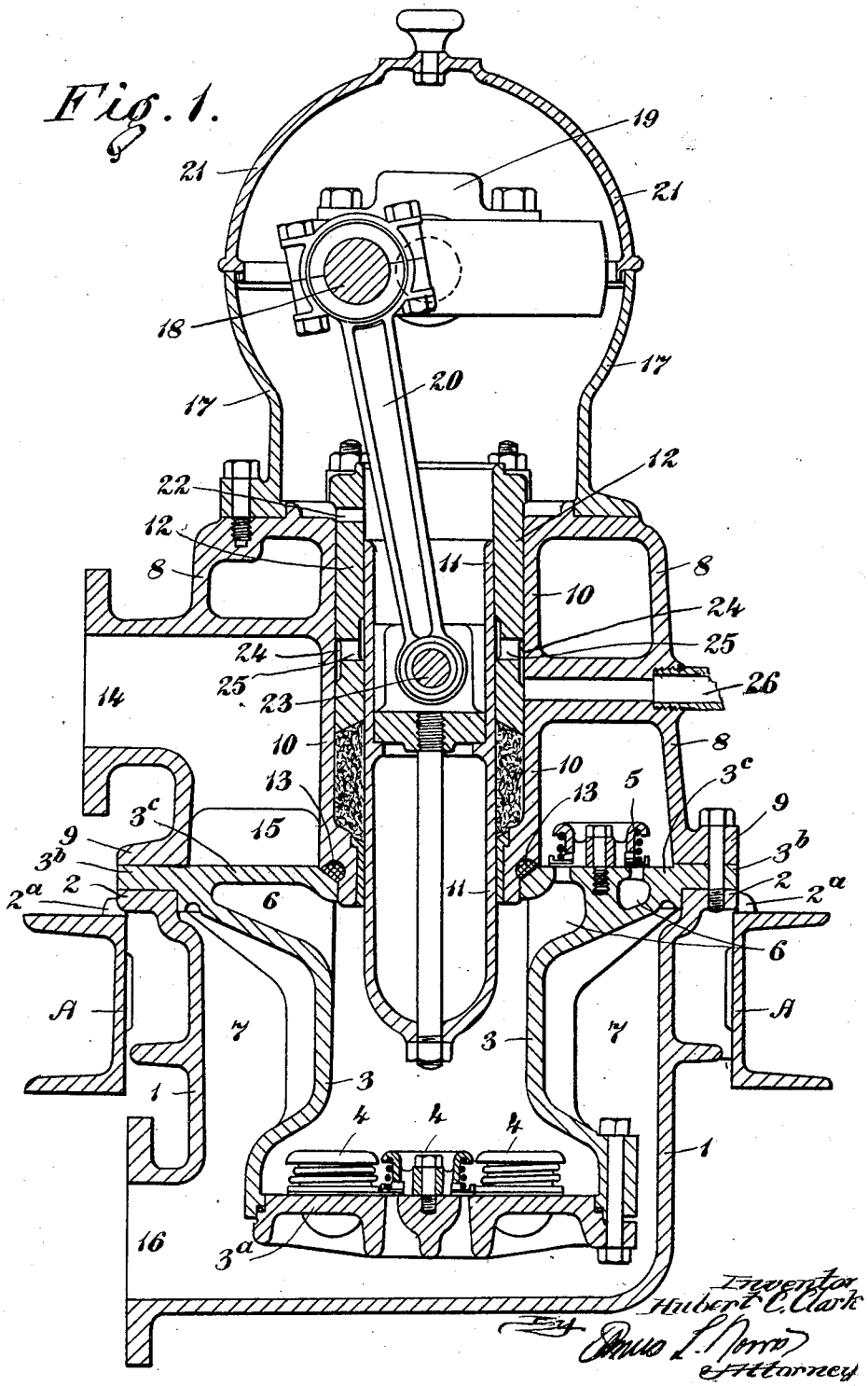
Mar. 27, 1923. 1,450,135

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CONSTRUCTION OF PUMPS

Filed Oct. 13, 1921 2 sheets-sheet 1.

Fig. 1.



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Fig. 2.

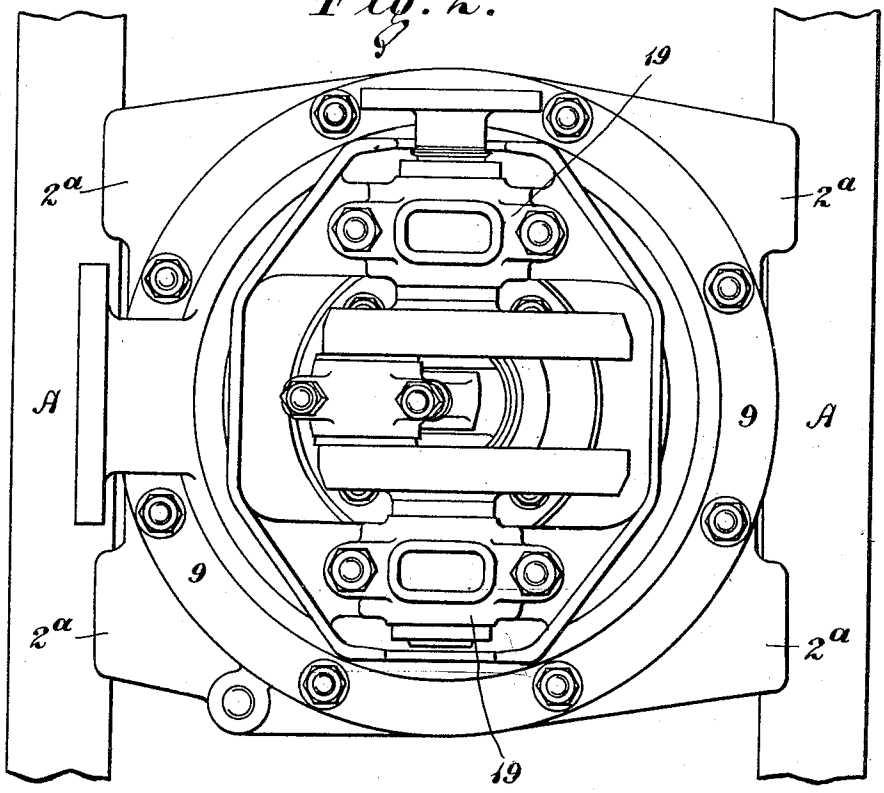


Fig. 3.

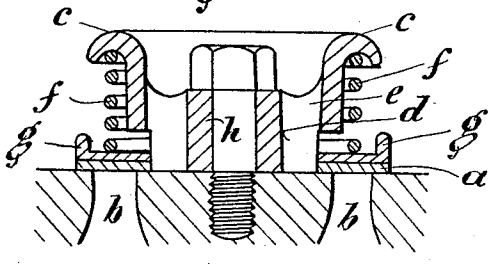
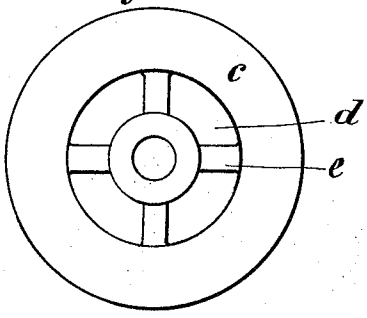


Fig. 4.



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Patented Mar. 27, 1923. 1,450,135

UNITED STATES PATENT OFFICE.

HUBERT CHARLES CLARK, OF LETCHWORTH, ENGLAND.

CONSTRUCTION OF PUMPS.

Application filed October 13, 1921. Serial No. 507,471.

To all whom it may concern:

Be it known that HUBERT CHARLES CLARK, a subject of the King of Great Britain, residing at Letchworth, England, has invented certain new and useful Improvements in the Construction of Pumps, of which the following is a specification.

This invention relates to high speed plunger pumps and has for its principal objects the following;

First, to so locate the valves and to so form the passages for the fluid that the water velocity is at all times low and any changes in direction of flow are very easy;

Second, to avoid reversal of flow when the plunger is reversed;

Third, to locate the air vessels as close as possible to the barrel so as to produce very short water columns between the plunger and the respective air vessels;

Fourth, to produce a pump of the character referred to which may easily be opened up by breaking only a single main joint without disturbing the plunger and driving mechanism and wherein, by breaking said single joint, both the delivery and suction valves may be exposed for inspection or repair.

Other advantageous features of the invention will appear as the description proceeds.

The invention will be clearly understood from the following description aided by the annexed drawings in which

Figure 1 is a sectional elevation of the pump.

Figure 2 a plan with the top cover removed.

Figure 3 a sectional elevation of one of the valves.

Figure 4 a plan of the valve cap.

According to this invention the pump comprises a base casting 1 which is supported on the foundations in any suitable manner. In the present instance the base casting 1 is shown as having extensions 2^a on a flange 2 formed around its upper edge and resting upon channel iron A, A.

Within the base casting 1 is a barrel 3 having flared ends and which carries the suction valves 4 on its lower end these being preferably secured to a plate 3^a bolted to the bottom of the barrel 3 and the barrel 3 is provided with a flange 3^b at its upper end 3^c which flange 3^b rests upon the aforesaid flange 2. The flared upper end 3^c carries the delivery valves 5 and suitable passages 6 are formed in the flared portion of the casting under the top 3^c to lead the water from the barrel 3 to the delivery valves 5. The annular space 7 between these two castings 1, 3 forms the suction air vessel.

A dome shaped casting 8 having a flange 9 at its lower end which flange 9 matches the flanges 2 and 3^b rests upon the barrel casting 3, the three castings 1, 3 and 8 being secured together by one set of bolts or studs which engage the flanges 2, 3^b and 9, so that, by removing the bolts, said three castings 1, 3 and 8 may be readily separated without disturbing the plunger and driving mechanism. The casting 8 forms the delivery air vessel and possesses a central cylindrical portion or cylinder 10 which contains the plunger 11 and its packing gland 12.

To form the necessary joint between this central portion 10 and the barrel 3 the centre portion 10 is extended to form a spigot around the base of which a semi-circular groove is cut. Into this groove is sprung an india rubber or other packing ring 13 which forms the joint. A chamfer is formed in a hole in the top of the barrel 3 of such a depth that the packing ring 13 is necessarily compressed when casting 8 is pulled down by the flange bolts and a tight joint is thus completed. A delivery outlet 14 is formed in the casting 8, and the casting 8 may be taken off at any point and in any direction and may or may not be provided with an internal or filling piece 15 as may be necessary to determine the capacity of the delivery vessel.

The base casting 1 is provided with a suction inlet 16 which may be placed in any suitable position and point in any desired direction.

Mounted upon the air vessel casting 8 is a bearing frame 17 in which the crankshaft 18 is carried in bearings 19 and the crank shaft 18 is coupled to the plunger 11 by means of a connecting rod 20. A removable cover 21 is provided for the purpose of retaining oil and excluding dust and dirt.

Oil thrown off by the crankshaft collects in the base of the bearing frame 17 and passes by means of holes 22 in the stuffing gland 12 to the plunger 11 which it lubricates. Some of this oil passes into the plunger during the lower portion of the stroke and provides lubrication for the gudgeon pin 23 contained therein.

Inner and outer grooves 24 are provided in the stuffing gland 12 and these are connected by passages 25. Any water leaking past the packing or surplus oil from the plunger collects in these grooves and is discharged through a passage 26 formed in the air vessel casting.

The valves 4, 5 may be of any of the spring controlled or gravity non return type, but I prefer the construction illustrated in Figures 3 and 4 which consist of a ring valve *a* which covers a plurality of holes *b* formed preferably in a circle in that part with which the ring *a* is associated, the ring valve *a* being held in position by an external ring *c* and an internal ring *h*. The internal ring *h* has its lower end extending below the lower end of the ring *c* and is connected to the latter by webs or division ribs *e*, thus forming spaces *d* for the passage of the liquid. The webs or division ribs *e* extend within and form guides for the ring valve *a* and the ring valve *a* is encircled by a spring *f* which is put in compression between a curled over edge of the ring *c* and a lipped plate *g* which encircles the webs or division ribs *e* presses on the ring valve *a*, the ring *c* being held in position by a screw which passes through the ring *h* and engages that part with which the valve is associated. By this construction the fluid on lifting the ring valve *a* will pass on both sides of same.

The valves may be arranged in multiple for both inlet and delivery or may be a single annular valve arranged around the vertical axis.

What I do claim as my invention and desire to secure by Letters Patent is:—

1. A plunger pump, comprising a base having an inlet, a barrel positioned within the base and carrying inlet and outlet valves, a dome positioned above the base and barrel, a pump cylinder carried by said dome, a crankshaft supported by the dome, a plunger working in said cylinder, a plunger rod for said plunger actuated by said crankshaft, the base and dome being provided with air spaces, and a single set of securing devices connecting the base, barrel and dome.

2. A plunger pump according to claim 1, wherein the air spaces of the base and dome are annular in form and surround said barrel and cylinder, respectively.

3. A plunger pump according to claim 1, wherein the barrel has flared ends and the inlet and outlet valves are disposed on said flared ends radially about the vertical axis of said barrel.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HUBERT CHARLES CLARK.

Witnesses:

FRED HUTCHINGS,

W. BROWN.