T. CAIRNS.

PUMP.

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1,098,558. Patented June 2, 1914.

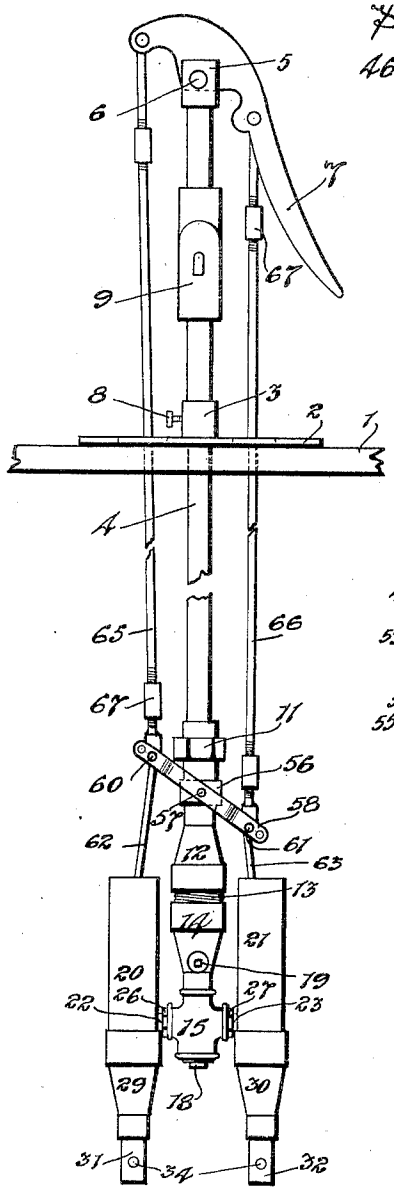


Fig. 1

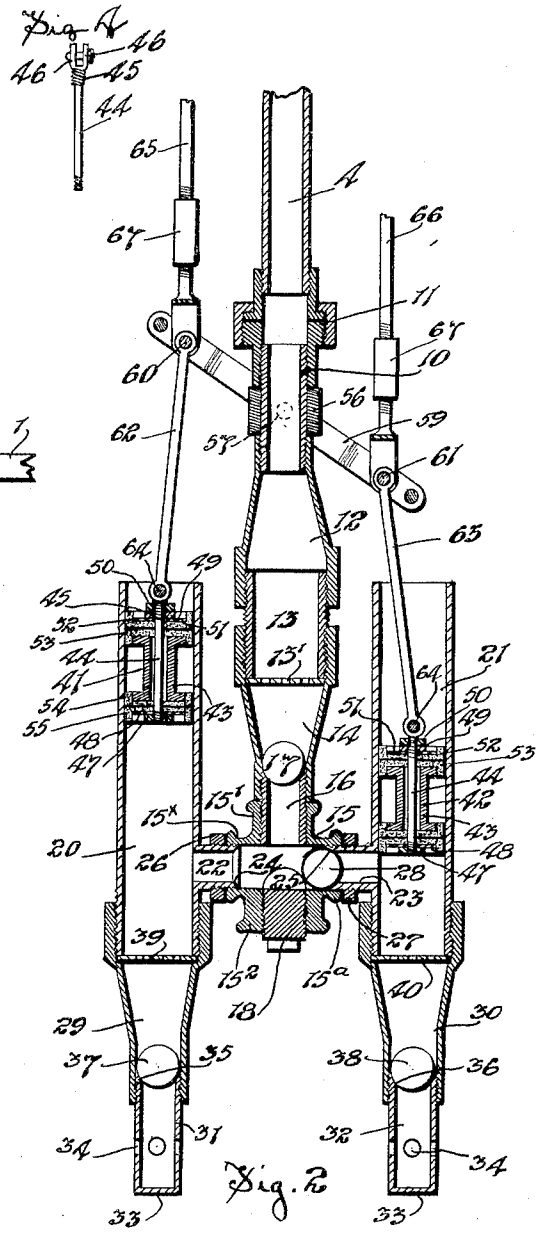


Fig. 2



Fig. 3

Witnesses

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PUMP.

1,098,558. Specification of Letters Patent. **Patented June 2, 1914.**

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To all whom it may concern:

Be it known that I, THOMAS CAIRNS, of the village of Holmfield, in the Province of Manitoba, Canada, have invented certain new and useful Improvements in Pumps, of which the following is the specification.

The invention relates to an improvement in pumps, particularly double acting pumps and the object of the invention is to provide an efficient inexpensive pump which has the parts arranged so that it can be readily taken apart or assembled, particular attention being paid to the construction to permit the working parts to be readily removed.

A further object of the invention is to provide a pump in which ball valves are used and one in which the plungers are arranged so that they are always properly alined.

With the above objects in view the invention consists essentially in the arrangement and construction of parts hereinafter more particularly described and later pointed out in the appended claim.

Figure 1 represents a side view of the complete pump. Fig. 2 represents an enlarged detailed sectional view through the lower portion of the pump showing the cylinders and plungers. Fig. 3 is a side view of the screw plug 18. Fig. 4 is a side view of the bolt 44.

In the drawing like characters of reference indicate corresponding parts in each figure.

1 represents a suitable platform located at the top of the well and 2 represents a base plate secured in any suitable manner to the platform. This plate is provided with a sleeve 3 which receives a feed pipe 4, said pipe having the lower end extending well down into the well and the upper end extending above the platform and supplied with a bracket 5 which carries a pin 6 on which I have fitted a handle 7. An adjusting screw 8 secures the feed pipe within the sleeve.

9 represents the ordinary pump spout which is located between the platform and the upper end of the feed pipe and opens to the end of the feed pipe in the usual way.

The lower end of the feed pipe is connected releasably to a nipple 10 by means of a coupling 11 and the lower end of the nipple is threaded and receives the threaded end of a cone-shaped casting 12 having the lower end thereof threaded and receiving a further nipple 13 which carries a second cone-shaped casting 14 similar to that at 12.

13′ is a strainer or sieve inserted within the casting 14 and held in position in said casting by the lower end of the nipple 13 which is screwed down against it.

15 is a four-way connecting piece presenting two vertical branches 15′ and 15^2 and two horizontal branches 15^x and 15^a. The branch 15′ thereof is secured by a short threaded pipe 16 to the lower end of the casting 14 it being noticed that the upper end of the pipe 16 is beveled off or coned out to provide a valve seat for the ball valve 17. The branch 15^2 of the connecting piece receives a removable screw plug 18 which is directly opposite the pipe 16 and is arranged to permit one to remove the pipe 16 after removing the plug. The plug has the inner end thereof fashioned so that when it is screwed properly into the connecting piece it forms a continuous runway with the branches 15^x and 15^a of said connecting piece.

The casting 14 is supplied with a screw plug 19 which permits one to remove the valve 17 when desired.

20 and 21 are two similar cylinders having the upper and lower ends thereof opened and the sides thereof formed toward the bottom with short nipples 22 and 23 having the extending ends coned out to form valve seats 24 and 25. The cylinders are carried by the connecting piece 15, the nipples 22 and 23 being screw threaded into the horizontal branches 15^x and 15^a. Lock nuts 26 and 27 are supplied to prevent the nipples from unscrewing from the coupling piece.

28 is a ball valve located in the connecting piece and designed to operate on the valve seats 24 and 25.

29 and 30 are two cone shaped castings similar to that at 14 which castings have their upper ends screw threaded onto the lower ends of the cylinders and their lower ends screw threaded and receiving short supply pipes 31 and 32 having their lower ends closed at 33 and the body portions thereof supplied with side openings 34. The upper ends of the supply pipes are coned out to form valve seats 35 and 36 on which operate ball valves 37 and 38. Strainers or sieves 39 and 40 are inserted in these latter castings and held in position by the cylinders which screw down on top of them when the parts are assembled.

41 and 42 are plungers slidably mounted in the cylinders. These plungers are similar in construction and one of them is now described in detail.

43 represents a metallic spool through which I have passed a bolt 44 having the upper end slightly enlarged and screw threaded as indicated at 45 and carrying further a pair of extending lugs 46 and the lower end thereof screw threaded and receiving a nut 47 and a washer 48.

49 and 50 are nuts threaded onto the enlargement 45 and 51 is a washer adjoining the under face of the nut 49.

52 and 53 are leather gaskets inserted on the rod between the upper end of the spool and the washer 51, these gaskets fitting snugly within the cylinder. 54 and 55 are further gaskets located between the washer 48 and the lower end of the spool these gaskets also fitting snugly within the cylinder.

The nipple 10 carries a collar 56 supplied with side pins 57 which receive similar rocking arms 58 and 59, the outer end of the arms being connected by short bolts 60 and 61 with the plungers, the lower ends of the links being fastened to the lugs 46 of the plungers by cross pins 64.

65 and 66 are rods having their upper ends connected pivotally to the pump handle on opposite sides of the pivot pin 6 and their lower ends connected pivotally to the rocking arms by means of the pins 60 and 61. Turn buckles 67 are inserted in the rods.

The operation of the pump is now described, it being understood that the supply pipes 32 and 33 pass well into the water in the well and assuming that the pump parts are in the position shown in the drawing. Upon the downstroke of the pump handle the plunger 42 is forced down and the plunger 41 raised. As the plunger 41 goes down it forces the water previously drawn into the cylinder 20 through the valve 37 into the connecting piece, the valve 28 being displaced by the water pressure from the valve seat 24 and forced over onto the valve seat 25. The water admitted to the connecting piece accordingly is forced up through the valve 17 into the castings 12 and 13 and to the feed pipe where it is trapped immediately the pressure is released. During the time that the plunger 41 is on the downstroke the plunger 42 is on the upstroke and is drawing water from the well into the cylinder through the supply pipe 32 and valve 38. When the plunger 41 has completed the downstroke the plunger 42 has completed the upstroke. Accordingly on the downstroke of the handle 7 the plunger 42 forces the water in the cylinder 21 through the valve 28 and the valve 17 into the castings 12 and 13 and the plunger 41 draws water into the cylinder 20 through the valve 37. The ball valve 28 is at this time seated on the seat 24. By reciprocating the handle 7 the water is forced by the plungers through the supply pipe and out the spout 9.

I wish to draw particular attention to the easy manner in which the pump can be taken apart. If either of the plungers become worn or ineffective one has simply to undo one or other of the pins 60 and 61 and the worn plunger can be removed out through the head of the cylinder which it will be noticed is at all times open. If it is desired to renew the valves or clean out the valve seats the pipes 31 and 32 can be readily removed by unscrewing and as soon as they are taken out the valves 37 and 38 drop out. The valve 17 can be removed by undoing the plug 19 as hereinbefore stated. The cylinders and plungers can be left in the well and the handle, supply pipe and rods can be removed by undoing the coupling 11 and the bolts 60 and 61. The rocker arms 58 and 59 can be removed and repaired readily and when the bolts 60 and 61 are undone and withdrawn the rocker arms can be taken off.

What I claim as my invention is:

The combination comprising a pair of similar cylinders supplied at the sides toward the bottom with extending nipples presenting seats, similar castings screw threaded onto the lower ends of the cylinders, sieves located in the castings at the lower ends of the cylinders, supply pipes screw threaded into the lower ends of the castings and formed with valve seats, there being further openings in the sides of the pipes, ball valves located in the castings and normally seated on the valve seats, a four way connecting piece secured to the nipples and providing a passage-way between the cylinders, a ball valve operating within the passage-way and designed to seat on either of the valve seats presented by the

nipples, a short threaded pipe carried by the connecting piece and opening to the passage-way between the latter valve seats, said short pipe having a valve seat, a ball valve operating on the latter valve seat, a pair of cone shaped castings secured to the short pipe, a strainer located within the latter castings and located above the latter valve, a nipple connecting said cone shaped castings and holding said strainer in place, a removable screw plug carried by the connecting piece and opening to the passage-way opposite said short threaded pipe, and a pair of plungers in said cylinders.

Signed at Cartwright this 19th day of April 1913.

THOMAS CAIRNS.

In the presence of—
GEO. R. ROBINSON,
LEE R. WRAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."