

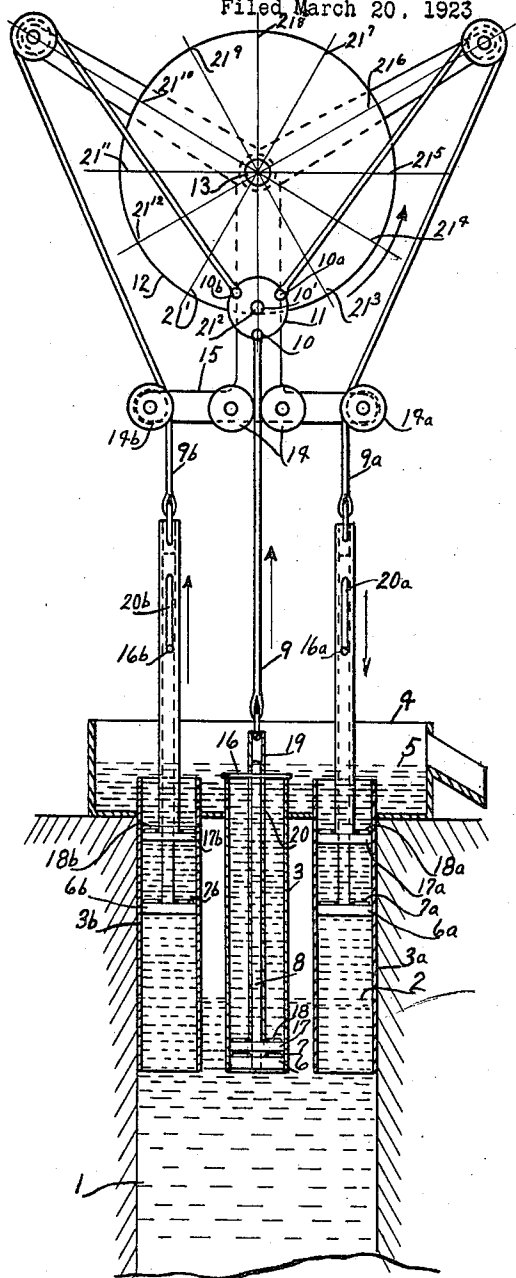
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G. M. ASK

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PUMP.

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To all whom it may concern:

Be it known that I, GEORGE M. ASK, a citizen of the United States, and a resident of San Jose, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

It is the object of my invention to provide a balanced pump whereby water may be lifted a given distance with a minimum amount of power.

It is another object of my invention to provide a pump of the character indicated that will be simple in form, economical to manufacture and highly efficient in its practical application.

The drawing is an elevation of my improved pump in a well, showing the operating mechanism, partly in section and partly in elevation.

Referring more particularly to the drawing, I show at 1 a well supplied with water to the level 2. At 3 is a cylinder arranged in the well and extending one foot below the water level 2 and a distance upwardly into a discharge tank 4 having a water level at 5. At 6 is a piston provided with upwardly opening check valves 7 and mounted to reciprocate in cylinder 3. Piston 6 is operated by a rod 8 connected by a cable 9 to a pin 10 on a plate 11 eccentrically mounted at 10' on a flywheel 12 mounted on shaft 13. The cable 9 operates over pulley 14 mounted on framework 15. In rod 8 is set a pin 16 extending laterally to engage the upper end of cylinder 3.

At 17 is shown a second piston mounted to reciprocate in cylinder 3 and fitted with upwardly opening check valves 18 and carried by a cylindrical rod 19 enclosing rod 8, this rod 19 having vertical slots 20—20 formed therein to engage pin 16 in rod 8 as shown.

For the purpose of illustrating the operation of the device it will be assumed that slots 20—20 are one foot long, the pin 16 normally engaging the lower ends of the slots and therefore maintaining the two pistons 6 and 17 a uniform distance of one foot apart. It will also be assumed that the pin connection 10 describes a circle when rotating about shaft 13, the axis of which is four feet long.

If now the pin connection 10 is on its bottom dead center the two pistons 6 and

17 will be in the positions shown in Figure 1 because pin 16 engaged the top of cylinder 3 when the piston 6 had reached the limit of its downward movement, this occurring when pin connection 10 reached the position 21'. The piston 17 however continues its downward movement until to a point close to piston 6, reaching the limit of its movement when pin 10 reaches its lower dead center 21². During these movements the water is of course passing up through the check valve to the upper side of piston 17, there being no movement of water from tank 4 and the two pistons being immersed in four feet of water.

The pin connection now moves through position 21³ a distance of two feet to position 21⁴ thereby raising piston 17 one foot and since this movement closes the check valves one foot of water is raised into tank 4 and overflows therefrom. During this movement piston 17 is actually raising but three feet of water, however, because while it is discharging one foot of water at the top the head of water in the well forces water into cylinder 3 below the piston 17, the inflow of water at this end increasing as the outflow at the top decreases.

In the construction herein contemplated, I provide two other pumps inserted in the well and communicating with the same tank 4, their parts being indicated by the numerals above used followed by an appropriate letter. The pin connections 10—10^a—10^b of the three cables are, however, equally spaced in triangular formation on plate 11. A separate pulley is provided for each cable, the three pulleys being also equally spaced in triangular formation corresponding to the spacing and arrangement of points 10—10^a—10^b.

As a result of this formation the following action obtains during the next succeeding movement of piston 13. The pin connection 10 now moves from position 21⁴ to position 21⁵ moving piston 17 upwardly one foot, and since pin 16 has now engaged slots 20 the piston 6 also moves upwardly one foot, the foot of water displaced thereby being taken up by the one foot head of water in the well forcing water into cylinder 3 beneath piston 17. In this movement pistons 6—17 have discharged one foot of water into tank 4, but since pistons 6^a and 17^a have been moved downwardly one foot, and 17 does not move at all there has been no discharge of water

from the tank. This perfect balancing of the three pumps continues during the full revolution of wheel 12 because as the pistons 6—17 ascend in cylinder 3 they draw the water therein up after them by suction so that they at all times carry, in the present case, three feet of water except during that portion of their travel when they pass through the foot of water in the bottom of cylinder 3, but while one set of pistons is immersing in the said water the other two sets are balanced, and as they move upwardly out of the said foot of water they are balanced by the new positions assumed by the other two sets of pistons and by the inflow of water beneath the piston moving out of said foot of water.

It may be readily now be seen from the foregoing that while the pumps are perfectly balanced throughout their entire cycles of operation, yet one foot of water is raised and discharged from tank 4 during each operation of each pump, or three feet during one complete revolution of wheel 12.

It is to be understood, of course, that the figures used herein are illustrative only to make it clear that the several piston strokes, head of water and radius of the circle described by point 10' are properly proportioned to secure the results set forth.

It is to be further understood that changes in form, construction and method of operation may be made within the scope of the appended claim.

I claim:—

In a pump, a revoluble driving element, an element pivotally mounted thereon in eccentric relation thereto, a cable attached to said last mentioned element a distance from the center thereof, a support for said cable arranged a distance from said driving element, a lift pump operatively connected to said cable, and counterbalancing means connected to said second mentioned element and arranged at the apices of an equilateral triangle.

GEORGE M. ASK.