G. GARTLING.

CABLE PUMP.

APPLICATION FILED AUG. 18, 1919.

1,389,428.

Patented Aug. 30, 1921.

Fig. 1

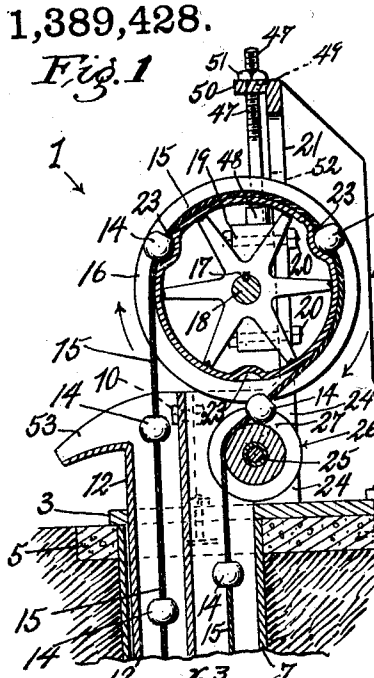


Fig. 2

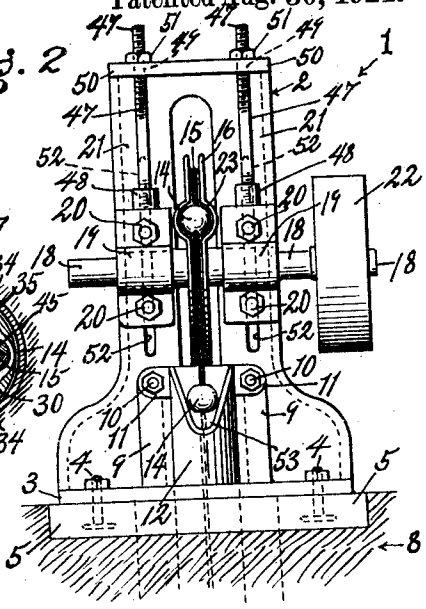


Fig. 7



Fig. 3

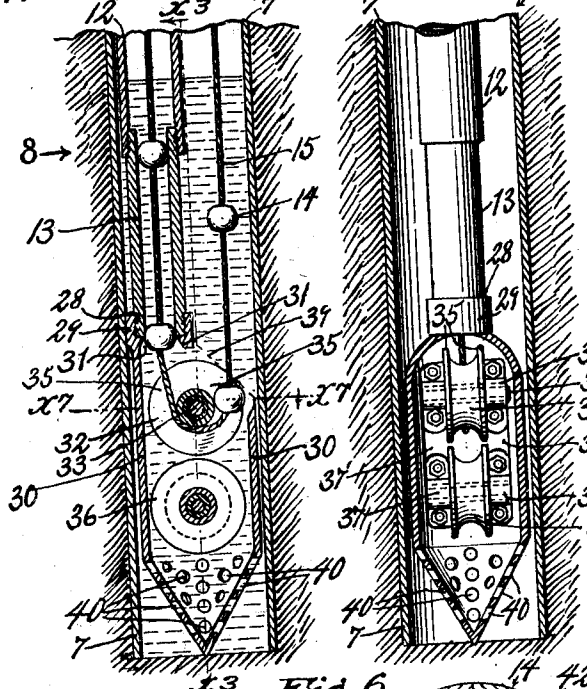


Fig. 4

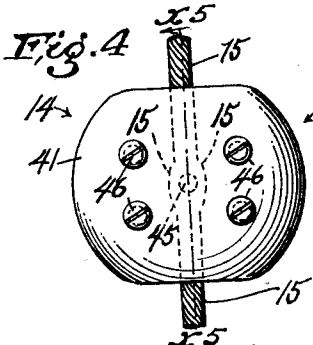


Fig. 5

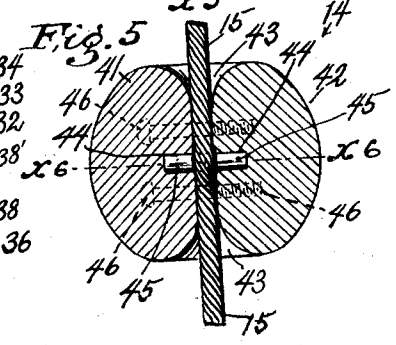
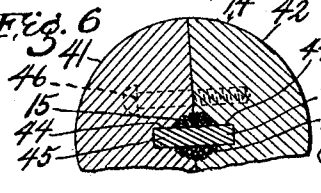


Fig. 6



Witnesses

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his atty

UNITED STATES PATENT OFFICE.

GEORGE GARTLING, OF LOS ANGELES, CALIFORNIA.

CABLE-PUMP.

1,389,428. Specification of Letters Patent. **Patented Aug. 30, 1921.**

Application filed August 18, 1919. Serial No. 318,401.

To all whom it may concern:

Be it known that I, GEORGE GARTLING, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Cable-Pump, of which the following is a specification.

This invention relates to appliances for lifting water through a casing by means of upwardly moving buckets that are attached to a cable; and the invention may be said to consist in the provision of the novel features and in the improved construction, combination and arrangement of parts as herein shown, described and claimed.

This cable pump is similar in construction and operation to the chain pump described in my application for Letters-Patent, filed June 30, 1919, Serial No. 307,795; this appliance being an improvement of my former invention.

The principal object of this invention is to provide a pump of the character described with buckets that are detachably connected to an endless cable; and means by which the buckets can be removed from the cable while it is under tension.

Another object of this invention is to provide a pump with a pump casing that has a larger internal diameter than the buckets on the endless cable; and which casing has at the bottom end thereof a cylinder that has an internal diameter substantially the same as the external diameter of the buckets.

Another object of this invention is to provide a cable pump that can be operated with small frictional resistance, and that can be cheaply constructed, easily assembled and repaired and which also will be exceptionally strong and durable and effective in action.

A feature of the invention is shown in the mounting and operation of the endless cable and associated parts.

Another novel feature of invention is shown in the mounting of the driving shaft and means for moving it to increase or decrease the tension on the pump cable.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

The drawings illustrate the invention.

Figure 1 is a central vertical section through the upper and lower ends of the pump with the intervening portion of the well and pump casing broken away.

Fig. 2 is a front elevation of the top portion of the pump, showing the pump stand anchored to the well platform.

Fig. 3 is a sectional elevation on the line x^3 of Fig. 1.

Fig. 4 is an enlarged view of one of the buckets attached to the endless cable.

Fig. 5 is a section on the line x^5 of Fig. 4 showing the means for attaching the buckets to the cable.

Fig. 6 is a section on the line x^6 of Fig. 5, parts broken away.

Fig. 7 is a section on the line x^7 of Fig. 1.

The pump 1 has its upper end provided with the stand 2 that has its base 3 secured by the anchor bolts 4 to the pump platform 5 that is preferably formed of cement.

The platform 5 has the opening 6 through which the well casing 7 extends downward to the bottom of the well 8.

The stand 2 has the upwardly extending flanges 9 to which are secured by the bolts 10 the lugs 11 on pipe 12. The lugs 11 are integral with the top of pipe 12, and by means of their connection to the stand just described the pipe is suspended in the well 8 so that the lower end is near the bottom of the well.

At the lower end of the pipe 12 there is detachably connected a suction barrel 13 that is preferably made of case hardened steel or tempered to resist the cutting effects of sand; and the interior diameter of this barrel is considerable less than the inside diameter of the pipe 12. Also this suction barrel is slightly longer than the distance between any two of the buckets 14 of the endless cable 15 so that there will always be one or more of these buckets in the barrel 13 when the pump is in operation.

The endless cable 15 is mounted on the pulley 16 that is secured by the key 17 to the driving shaft 18. This driving shaft

is mounted in the bearing boxes 19 that are secured by the bolts 20 to upright flanges 21 of the stand 2; and the shaft 18 is rotated by the pulley 22 which is driven from some source of power not shown.

The pulley 16 has the spaced recesses 23 that fit the periphery of the rounded buckets 14 so that the cable 15 contacts with and lies snugly in the groove of the pulley 16.

Mounted in the vertical walls 24 of the stand 2 is a shaft 25 on which there is mounted the idle pulley 26 that is of smaller diameter than the pulley 16; and the purpose of this pulley is to direct the cable 15 forwardly and into the well casing after it has passed over the pulley 16. The pulley 26 is provided with the flanges 27 that are adapted to receive the rounded buckets 14 so that the cable 15 will contact with the periphery of the pulley.

The bottom end of suction barrel 13 is threaded to fit the socket 28 that is threaded into the reduced pipe end 29 of the shoe 30. The pipe end 29 is integral with the upper end of the shoe 30, and the lower part of the inner wall of the pipe 29 has the beveled surfaces 31 that form a guide for the buckets 14 so that they will enter centrally the suction barrel 13.

Within the shoe 30 is the pulley 32 that is adapted to carry the cable 15, and this pulley is secured on the shaft 33 mounted in the bearing blocks 34. The pulley 32 is provided with the flanges 35 that are adapted to receive the rounded buckets 14 so that the cable 15 can contact with the periphery of this pulley.

Another pulley 36 on the shaft 36′ is mounted between the bearing blocks 37 and 38 respectively, that are secured in the extensions 37′ and 38′ on interior wall of shoe 30, and the purpose of this pulley is to prevent the escapement of the cable from the pulley 32 when the cable is slackened for repair or replacement of the buckets.

The upper end of the shoe 30 has the opening 39 through which the cable and buckets descend when the pump is in operation. The lower end of the shoe 30 is contracted into the form of an inverted cone in which there are a plurality of small openings 40 for the passage of water from the bottom of the well into the cylinder. These small openings however prevent large rock from entering the shoe 30 and obstructing the operation of the pump. Preferably the diameter of the cylindrical wall of shoe 30 is such that it can freely enter the well casing 7 and will fit so snugly that large rock or gravel cannot enter between the exterior surface of the cylinder 30 and inner wall of the casing 7.

The buckets 14 are formed of the halves 41 and 42 which parts have between them the central opening 43 for the cable 15; and also each of these halves 41 and 42 is provided with the sockets 44 that are adapted to fit snugly over the ends of the pin 45 when the halves of the bucket are secured together. The purpose of the pin 45 is to prevent longitudinal movement of the buckets on the cable 15; and this is accomplished by separating the strands of the cable 15 and inserting the pin therein. Then the halves 41 and 42 are placed together so that pins 45 have their ends in the sockets 44; after which the halves are secured together by the countersunk screws 46.

The opening 43 from about one-fourth the distance from the center of buckets 14 is enlarged toward the outer surface of the buckets for the purpose of giving play to the cable at its points of egress from the buckets so that it can bend freely to the curvature of the pulleys when passing over them.

After the cable 15 is placed over the pulleys 16, 26 and 32, the right tension is applied to it by means of the rods 47, which rods have one end secured in the bosses 48 on the bearing blocks 19. The other ends of the rods 47 are threaded and pass through the openings 49 in the forwardly extending ledge 50 of the stand 2, and by means of the nuts 57 the bearing blocks 19 and associated parts can be moved upwardly to apply tension to the cable.

This upward movement of the bearing blocks 19 is accomplished only when the bolts 20 are loosened for that purpose; after which the bolts 20 can move freely in the slots 52 in the stand 2; and when the right tension is applied to the cable 15 the bolts 20 are tightened to hold the bearing blocks securely in place.

Also by loosening the bolts 20 and unscrewing the nuts 51 on the rods 47 the wheel 16 and associated parts can be lowered for the purpose of replacement or repair of parts.

It is not necessary however to have slack in the cable 15 for the purpose of repairing or replacing the buckets 14 as with the foregoing improvement in the bucket construction they can be placed on the cable while it is under full working tension.

If desired the upper end of the pump casing 12 can be provided with a downwardly inclined discharge spout 53 that can be integrally connected to pipe 12.

In practice the pump is assembled as heretofore described and placed in pumping position in a well. Then power is applied to the pulley 22 to rotate the pulley 16 in the direction of the arrows shown in Fig. 1, whereby the cable 15 will be moved so that as one line of buckets move downward into the well 8 the other line of buckets will pass upward through the suction barrel 13 and pipe 12 and lift the water from the bottom of the well and discharge it from the spout 53.

The buckets 14 are positioned on the cable 15 so that their largest diameters are substantially the diameter of and contact with the inner wall of suction barrel 13. And when these buckets are drawn upward through this barrel 13 they lift the water above them and below them.

As previously stated the buckets 14 contact only with the wall of the barrel 13 and never touch the wall of pipe 12 so that there is frictional contact only with suction barrel 13.

I claim.

1. In a pump of the character described, and endless cable, pins in said cable and buckets secured over said pins.

2. In a pump having an endless cable, pins secured in the endless cable, and buckets on said pins, said buckets detachably secured to the endless cable.

3. In a pump having an endless cable, short pins extending transversely through the endless cable, buckets, and means for securing said buckets to the endless cable so that they inclose said pins.

4. In a pump having an endless cable, short pins spaced equidistant apart and extending transversely through the endless cable, buckets that are separated in halves, and means for securing the halves of said buckets together so that they inclose said short pins.

5. In a pump having an endless cable, pins spaced equidistant and extending transversely through the endless cable, buckets that are separated in halves, recesses in the halves of said buckets, and screws for attaching the halves of said buckets together around the endless cable so that said pins are inclosed in said recesses.

6. In a pump having an endless cable to which cable is removably attached a plurality of rounded buckets that are spaced equidistant apart on the cable, a pump casing inclosing a portion of the endless cable and buckets thereon, said casing having an internal diameter larger than the external diameter of the rounded buckets, a cylinder attached to the pump casing, said cylinder having an internal diameter substantially the same as the external diameter of the rounded buckets, and a guide at the lower end of said cylinder.

7. In a pump, a stand, a pulley mounted on said stand, a pipe secured to said stand said pipe extending downward into a well casing, another pulley mounted below said pipe, an endless cable on said pulleys, pins spaced equidistant on said cable and extending transversely through said cable, rounded buckets inclosing said pins said buckets having openings therethrough that enlarge from near the center of said buckets outwardly to form for the cable so that it can bend to the periphery of said pulleys.

8. In a pump, a platform, a stand secured to said platform, a well casing, a pipe having its upper end secured to said stand, said pipe extending downward into said well casing, a suction barrel detachably connected to the lower end of said pipe, a shoe detachably connected to the lower end of said suction barrel, flanges on said stand, bearing blocks on said stand, a shaft in said bearing block, a pulley on said shaft, a pulley in said shoe, a cable on said pulley, a plurality of round buckets on said cable, said cable and buckets adapted to move upward through said pipe and suction barrel, a flange extending forward from said stand, rods extending through said flange, said rods having their lower ends connected with said bearing block, and means for moving said rods to raise or lower said bearing blocks for the purpose specified.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 8th day of August, 1919.

GEORGE GARTLING.

Witnesses:
JAMES R. TOWNSEND,
WM. M. GENTLE.