Oct. 18, 1960 E. W. MOREHEAD 2,956,511

WATER LIFTING DEVICE

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Fig. 1

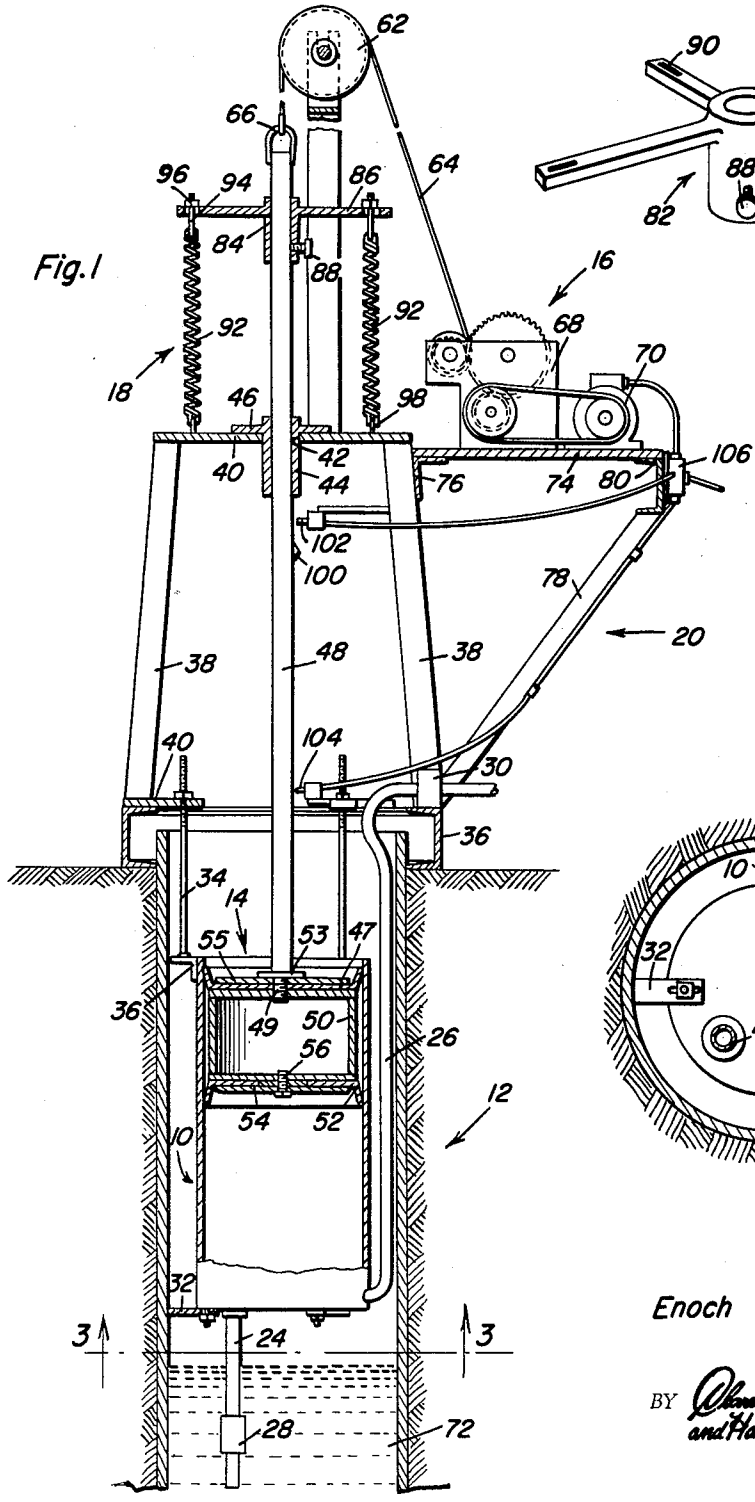
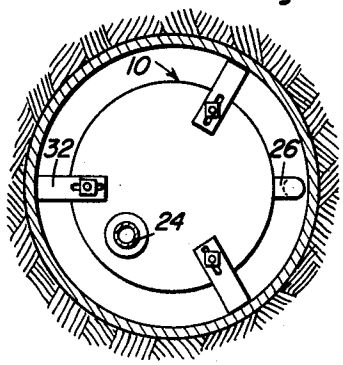


Fig. 2

Fig. 3



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Fig. 4

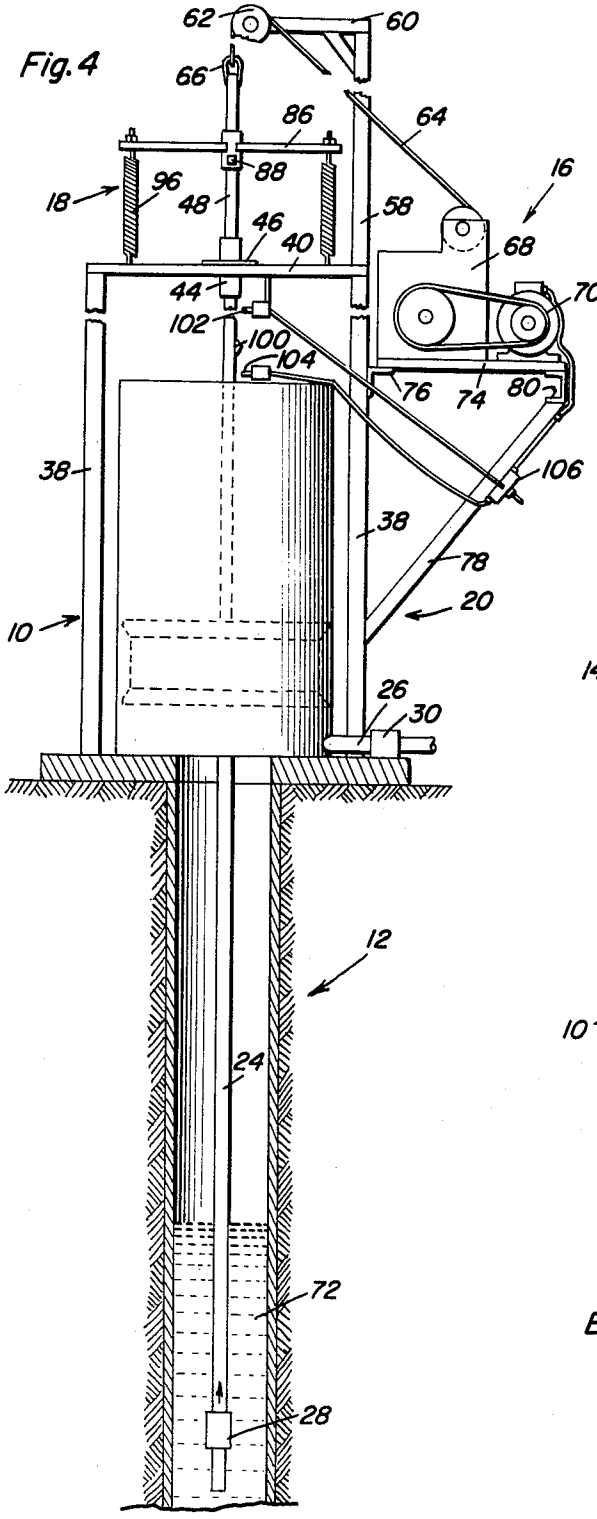
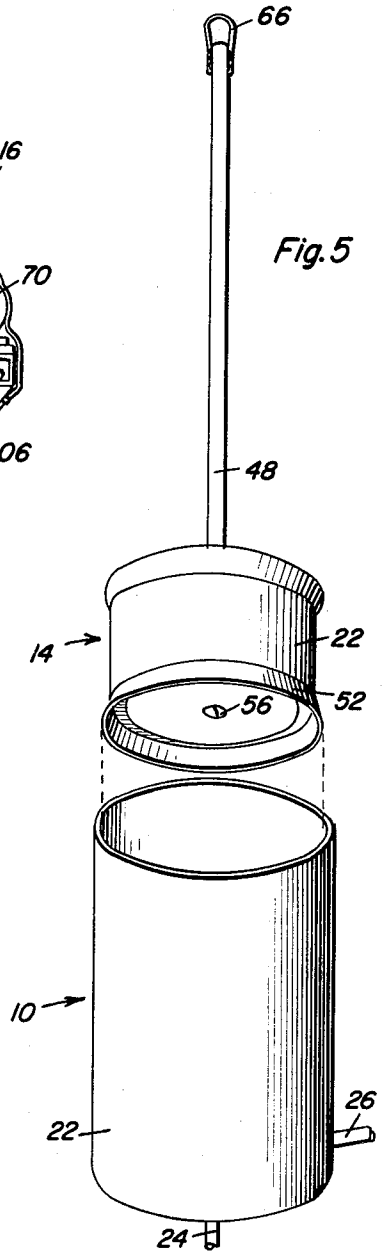


Fig. 5



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WATER LIFTING DEVICE

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1 Claim. (Cl. 103—211)

This device relates generally to attachments for water wells, and more particularly to a novel type of water lifting device for a shallow well or bored well.

The primary object of this invention is to provide a water lifting device for use in conjunction with wells, which does not require the constant running of a motor when water is being drawn therefrom.

A further object of this invention is to provide a water lifting device wherein water is elevated from a well to a water storage tank, and means are provided for constantly applying pressure within this tank, so that at any time water may be withdrawn from the tank, such as by means of pipes, without the necessity for a motor to be running while water is being so withdrawn, as is the case with conventional types of well pumps.

A further object of this invention is to provide a water lifting device which is completely automatic, so that a constant level of water will be maintained between minimum and maximum points, so that ordinarily no manual intervention is necessitated.

An even further object of this invention is to provide a water lifting device which may be used with both dug wells and bored wells.

Yet a further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a vertical sectional view taken through the device, illustrating the use of my invention in conjunction with a shallow or dug well;

Figure 2 is a perspective view of the spider to be used in conjunction with my device for constantly urging the piston downwardly;

Figure 3 is a horizontal view of the bottom of the storage tank, taken substantially along the plane defined by reference line 3—3 of Figure 1;

Figure 4 is a side elevational view of my device, as it would be used in conjunction with a bored well; and

Figure 5 is an exploded perspective view of the piston and water storage tank comprising a basic part of the present invention.

Referring now more specifically to the drawings, the numeral **10** generally designates the storage tank comprising the present invention, illustrating the same mounted in or on top of a well **12**, in Figures 1 and 4 respectively. A piston **14** is inserted into tank **10**, to vary the air pressure within the tank. The piston **14** is elevated by drive means **16**, and is urged downwardly by resilient means **18**. A frame **20** supports the whole assembly.

The water storage tank **10** is constructed of an open cylinder **22**, having a water inlet pipe **24** connected to the bottom thereof, and a water outlet pipe **26**, is connected to the lower end of the side wall of the tank. A foot valve **28** interrupts inlet pipe **24**, and a check valve **30** interrupts outlet pipe **26**.

Looking now more particularly at Figure 1, it may be seen that water storage tank **10** is located internally of a shallow dug well **12**. The water tank is maintained in this position by means of inwardly extending brackets **32**, upon which the tank rests and is bolted, and hangers **34**, which extend upwardly from angle irons **36** connected about the upper end of tank **10**. A pair of channel members **37** constitute a base for frame members **38**. Extending inwardly from the upper end of the members **37** are brackets **40**, to which hangers **34** are adjustably connected, so that it may now be seen that tank **10** is firmly held in position within the upper portion of the well. A plate **41** is connected to the upper ends of frame members **38**, and has a centrally located vertical opening **42** formed therethrough, into which is fitted a bearing **44** having a projecting collar **46** about the upper end. A shaft **48** is vertically, slidably journalled in bearing **44**, and extends upwardly through plate **41**, as well as downwardly itno water storage tank **10**. At the lower end of shaft **48** is connected a piston which is constructed of a cylindrical-like member **50** having a circular side wall and flat top and bottom walls. A flexible gasket **52** having a downwardly bent flange portion is connected to the lower end of cylinder **50**, and another gasket **47** is connected to the upper end thereof. Gasket **52** is connected by means of a plate **54** locking the flexible member **52** to the cylinder by means of bolt **56**. The lower end of shaft **48** is threaded as at **49** and has a washer **53** connected near the end, so as to abut against a plate **55**. Threaded portion **49** is connected to the upper end of cylinder **50** and, by means of plate **55** the flexible member **53** is connected to the cylinder.

An upwardly projecting post **58**, see Figure 4, is connected to plate **41**, and has a horizontal beam **60** connected at the upper end thereof. A grooved pulley **62** is rotatably mounted on beam **60**. A strand **64** of wire or other strong material is disposed about grooved pulley **62**, and has a stirrup **66** located at one end thereof, which stirrup is connected to the upper end of shaft **48**. The other end of wire **64** is driven by means of winch **68**, which is in turn driven by motor **70**. Thus, it may be seen that when winch **68** is activated the wire **64** will be wound upon the winch, and thus shaft **48** will be elevated, elevating piston **14** therewith and causing a suction within tank **10** which will draw water **72** into the tank **12** upwardly through inlet pipe **24**, and this water will be held in the tank by means of foot valve **28**. The motor and winch **70** and **68** respectively may be supported by any suitable means, but are shown supported upon a table **74** which is mounted upon angle iron **76** which is attached to one of frame members **38**, and a base member **78**, which is also attached to one of frame members **37**, and supports the outer end of the table **74** through the medium of a channel beam **80**.

In Figure 2 is illustrated a spider **82** which is constructed of a sleeve **84** having radial arms **86** extending outwardly from the upper end thereof. The sleeve **84** is fixed upon shaft **48** by means of setscrew **88**. At the outer ends of each arm **86** a longitudinally extending slot **90** is formed vertically through the arms. Strong springs **92** are adjustably fastened in slots **90** of arms **86** by any suitable means, such as by hooks **94** having a threaded shank passing upwardly through slot **90**, which is fixed in place by a nut **96**. The lower end of spring

92 is connected to loops or eyes 98 which are fastened to top plate 41.

The piston 14 is provided with any suitable type of limiting means which will automatically limit the uppermost and lowermost position of the piston, so that the piston will always be between a predetermined range, and the water storage tank 10 will always have a predetermined amount of water in the tank ranging between a set maximum and minimum. For instance, illustrated diagrammatically in Figure 4 of the drawings, may be seen an upper contact 102 and a lower contact 104, which are in such a position as to be contacted by projection 100 on shaft 48, upon upward or downward movement of the shaft. Wires from contacts 102 and 104 lead into control box 106 which is provided with suitable switches to control the operation of the motor 70, the switches being well known in the art.

In use, the machine when first set up, will be manually started, so that as piston 14 rises in the water storage tank, a suction is created which will tend to force water 72 in the well up into the storage tank. When the piston reaches a position near the top of the tank 10, the projection 100 will touch contact 102, and shut off motor 70, thus stopping the actuation of the winch 68. Then, as water is withdrawn by means of pipe 26, the water level in tank 10 will go down, and the piston will move downwardly accordingly, both because of its own weight, and because of strong springs 92 urging it downwardly. When the piston reaches a position close to the bottom of tank 10, projection 100 will touch contact 104 and the motor will be actuated which will drive winch 68 and serve to raise piston 14, until projection 100 again contacts element 102. Thus, the cycling will continue and the operation will be automatic. In this way, a motor 70 does not have to be constantly actuated in order for water to be withdrawn from pipe 26, as the case in conventional type of water lifting units. For instance, if water storage tank 10 were made to hold 150 gallons, and this amount were enough for a family's needs, for one day, it would be seen that the motor 70 would be actuated automatically once each day.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

A device for delivering water from a well comprising a cylindrical water storage tank, mounting means supporting said tank in a well and with its bottom end above the water level of a well, a suction line having its lower end provided with a foot valve and immersed in the water in the well and communicating with the interior of said tank at the lower end thereof, a non-return discharge line communicating with the interior of said tank at its lower end, a piston reciprocable in said tank and having fluid tight sealing engagement therewith, a rigid, straight and inflexible piston rod secured at its lower end to said piston, a spider fixedly secured to and mounted on said piston rod, spring means connected to said spider and yieldingly urging the piston downwardly in said tank, actuating means connected to said piston rod for lifting the latter and the piston with a straight line motion against the resistance of said spring means, limit means including an actuator fixedly mounted on said piston rod controlling the operation of said actuating means and thereby limiting the upper and lower limits of the piston stroke in said tank, said actuating means including an electric motor and an electrical circuit connected thereto, a winch drivingly connected to said motor, a cable connected to said winch and to said piston rod, said limit means including upper and lower limit switches mounted on said mounting means adjacent said piston rod and disposed in said circuit and controlling the operation of said motor, said actuator consisting of a projection extending laterally of said piston rod and movable between said limit switches and actuating the latter.

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