F. R. HAZARD.

PUMP.

APPLICATION FILED SEPT. 30, 1913.

1,163,535.

Patented Dec. 7, 1915.

3 SHEETS—SHEET 1.

Fig. 1.

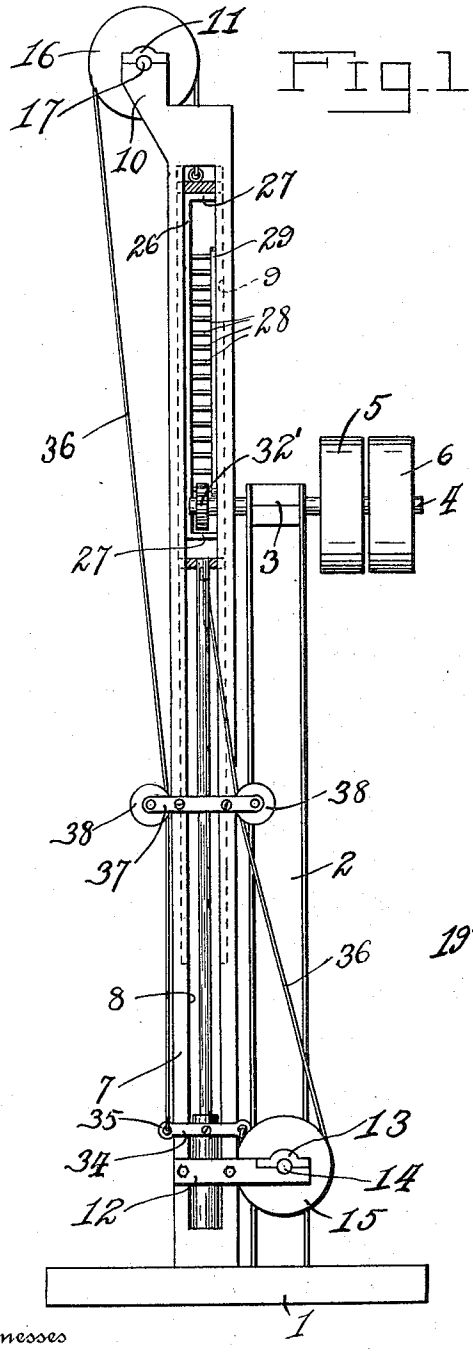


Fig. 2.

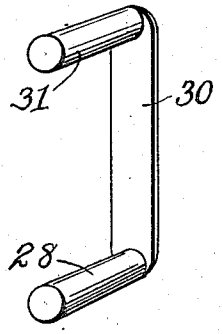
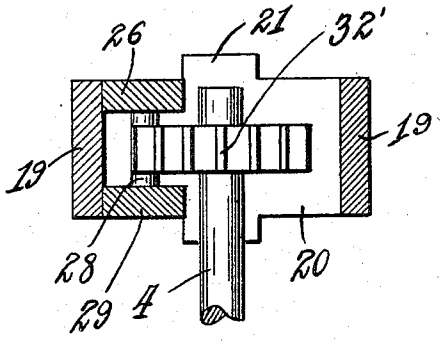


Fig. 3.



Witnesses

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3 SHEETS—SHEET 2.

Fig. 4.

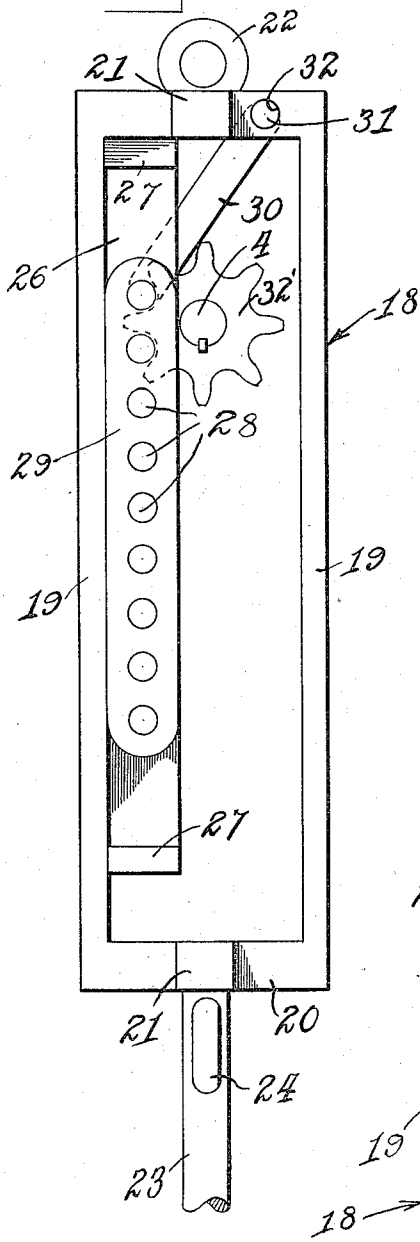


Fig. 5.

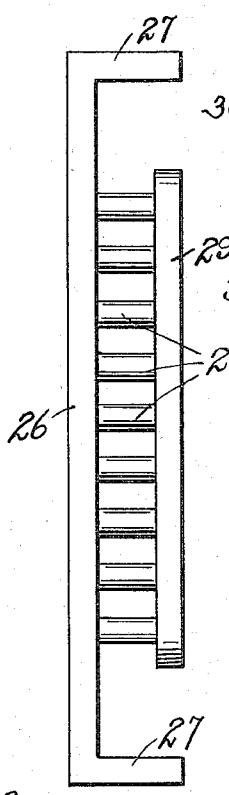


Fig. 6.

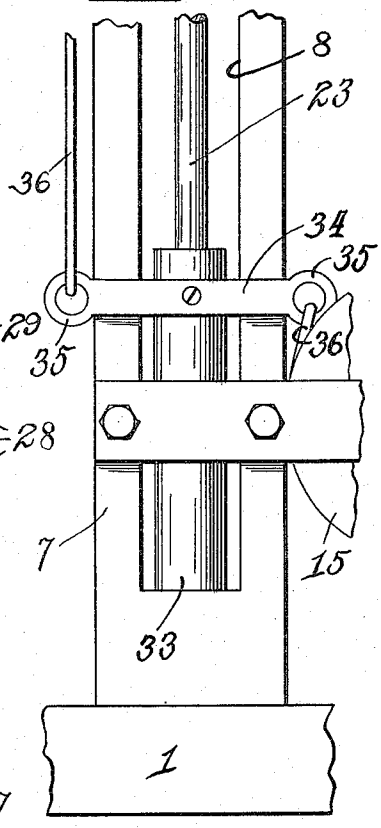
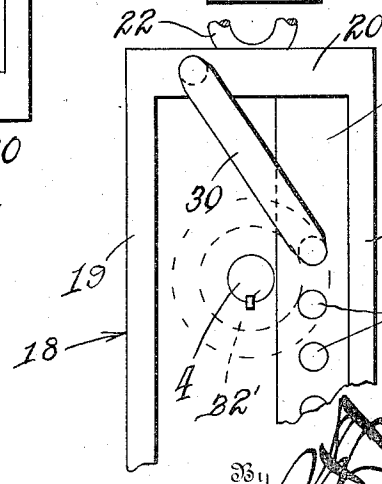


Fig. 7.



Witnesses

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3 SHEETS—SHEET 3.

Fig. 8.

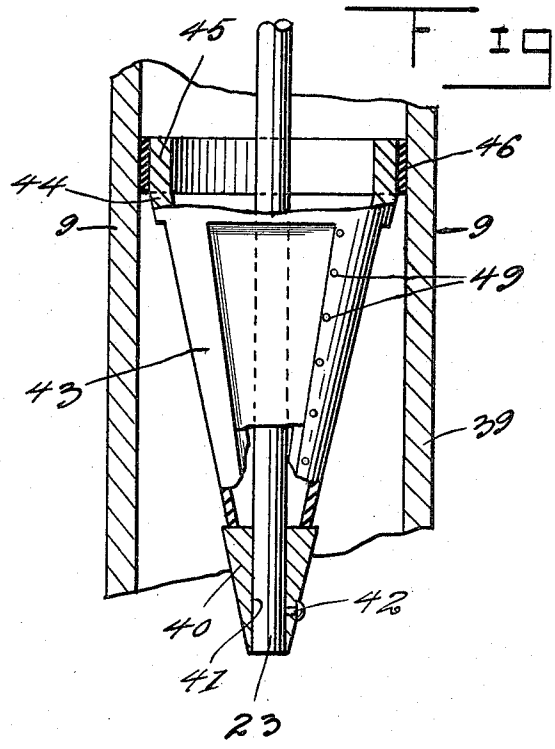
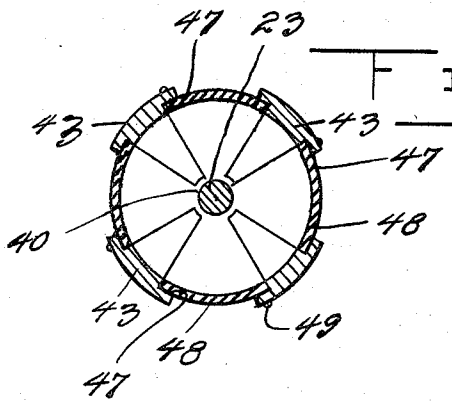


Fig. 9.



Witnesses.

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1,163,535. Specification of Letters Patent. Patented Dec. 7, 1915.

Application filed September 30, 1913. Serial No. 792,671.

To all whom it may concern:

Be it known that I, FRANK R. HAZARD, a citizen of the United States, residing at Santa Ana, in the county of Orange and State of California, have invented certain new and useful Improvements in Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in pump operating mechanism wherein the volume of water which is to be raised is materially increased.

Another object of my invention is the provision of such a device which will be a double-acting pump and thereby materially reduce the amount of power used.

A further object of my invention is the provision of such a device providing a novel combination and arrangement of parts wherein a cheaper and simpler construction will be provided, thereby materially lessening the cost of production.

With the above and other objects in view I will now proceed to describe my invention in the following specification and accompanying drawings, in which,

Figure 1 is a side view of my improved pump operating mechanism, showing the same partly in section, Fig. 2 is a detail perspective view of the link which is used in connection with the pump, Fig. 3 is an enlarged transverse sectional view through the frame and the operating mechanism therefor. Fig. 4 is an enlarged detail view showing the frame and the operating mechanism in elevation, Fig. 5 is a detail view of the operating mechanism, Fig. 6 is an enlarged detail view of the frame of my improved pump showing the piston rod mounted therein, Fig. 7 is an enlarged view of the rear side of Fig. 4. Fig. 8 is a view of my improved valve used in connection with the operating mechanism, and Fig. 9 is a transverse sectional view taken on line 9—9 of Fig. 8.

Referring to the drawings by characters of reference 1 indicates the base of my improved machine, having secured thereto a suitable upright 2. This upright is preferably an I-section and is provided at its upper extremity with the split bearing 3 through which the driving shaft 4 having secured thereto a suitable fixed pulley 5 and rotatably mounted thereon a suitable loose pulley 6 is adapted to be journaled.

Suitably secured to the base 1 at a point immediately adjacent the upright 2 I preferably provide the frame 7, which is longitudinally slotted as illustrated by the numeral 8, and provided with suitable longitudinal grooves 9, the use of which will be more fully hereinafter described. At the upper extremity of the frame 7 and formed integrally therewith I preferably provide a suitable bracket 10 having a journal bearing 11 formed at the upper end thereof. Suitably secured near the lower end of the frame 7 I preferably provide the angularly extending arm 12, which is provided with a suitable bearing 13 in which the shaft 14 is adapted to be journaled. A suitable wheel 15 having an annular groove therein is secured to the shaft 14, as clearly illustrated in Fig. 1. A wheel 16 constructed in a manner similar to the wheel 15 is secured to a suitable shaft 17 which in turn is journaled in the bearing 11 formed at the upper end of the frame. A suitable frame 18 which preferably comprises the upright members 19 and the top and bottom members 20 is slidably mounted on the lugs 21 in the main frame, which is indicated by the numeral 7. A suitable ring 22 is secured to the upper extremity of the frame 18 and is adapted to serve as a connection for the flexible member which will be more fully hereinafter described. Suitably secured to the lower end of the frame 18 and extending downwardly therefrom I preferably provide a suitable rod or other rigid connecting means 23. This rod 23 is preferably provided adjacent its upper end with a suitable ring 24 which is constructed in a manner similar to the ring 22.

A suitable rack bar 26, having extending outwardly therefrom the arms 27, is provided and is adapted to form a means by

which the device is operated. This rack bar 26 preferably comprises the rollers 28 which are extended through apertures formed in the bar 26 and their free ends are preferably extended through apertures formed in a suitable bar 29. This bar 29 is preferably of less length than the bar 26 and is rounded at each end as clearly illustrated in Figs. 4 and 5.

The upper roller 28 is preferably extended as shown in Fig. 5 and is provided with the upwardly extending member 30 which has formed at its upper end the arm 31 which is adapted to extend through an aperture 32 formed in the upper end of the frame as clearly shown in Fig. 4. Thus, it will be seen that a suitable connection will be formed between the rack bar and the frame 18, thereby materially assisting in the operation of the device.

The bar 23 is preferably extended downwardly, as clearly shown in Figs. 1 and 6, and is adapted to be connected to the piston of the pump.

Suitably secured to the end of the shaft 4 opposite the wheel 6 I preferably provide a suitable gear wheel 32′ which is adapted to coöperate with the rack bar 26 when the device is in operation. This gear wheel is adapted to continually rotate thereby imparting motion through the medium of the teeth which mesh with the rollers 28 to the frame, thus forcing the frame up and down in a reciprocating motion and causing the pump to draw water upwardly through the action of the valve. A suitable hollow piston rod 33 is slidably mounted in the frame and is connected with the coöperating piston. This rod 33 is preferably provided at its upper extremity with the transversely extending member 34, which is provided at each extremity with suitable eyes 35 to which the flexible connection 36 is adapted to be secured. Each of these flexible connections 36 preferably passes over their respective rollers 15 and 16 and the opposite terminals thereof are connected as illustrated in Fig. 1. Suitably secured intermediate the ends of the main frame 7 I preferably provide the transversely extending arm 37 to which is preferably secured the idle roller 38 over which the flexible connection 36 is adapted to pass.

The valve which is used in connection with the operating mechanism previously described and illustrated in Figs. 8 and 9, preferably is reciprocably mounted in the casing 39. This valve preferably comprises the cone shaped body portion 40 having extending longitudinally therethrough the bore 41 which is adapted to surround the lower end of the shaft 23 and be secured thereto by means of a suitable set screw 42. Extending upwardly from the cone shaped body portion and formed integral therewith I also provide the arms 43 which terminate at their upper extremity in the annular collar 44 having formed integral therewith the ring 45. Surrounding the periphery of the ring 45 and firmly secured thereto I preferably provide a suitable packing ring 46 which is adapted to frictionally engage the sides of the casing 39 and form a tight joint between the casing and the valve.

The arms 43 are preferably rabbeted, as shown at 47, to receive the edges of the flaps 48 which are formed of leather or any other suitable flexible material, one of the edges of each of the flaps is riveted or otherwise secured as shown at 49 to the arms as will be clearly seen upon referring to Fig. 9.

It will be apparent from the foregoing that when it is desired to make use of my improved pump the wheel 5 is set in motion by the shifting of a suitable drive belt from the wheel 6, thus rotating the shaft 4 and imparting rotary motion to the gear wheel 32′ which meshes with the rack bar 26 and causes the same to travel upward. When the rack bar has reached its upper limit of travel it will be obvious that the upper roller 28 will be carried across the frame 18 and the lowermost angular extension 27 is forced into engagement with the bottom members 20 of the frame. Upon further rotation of the wheel it will be apparent that the frame 18 will be forced downwardly and thereby impart motion to the rod 23 which being operatively connected with the pump piston will cause the same to operate and thereby materially assist in raising the water. When the rack bar has reached its farthest distance of travel downwardly it will be apparent that the upper roller 28, which is connected to the arm 30, will come into engagement with the teeth of the gear wheel 32′ and it will be apparent that said rack bar will be carried across the frame and placed in a position, illustrated in Fig. 4. Thus, it will be seen that upon continuous operation the frame 18 will be caused to reciprocate and thereby impart motion to the rod 23 and also to the hollow rod 33, through the medium of the flexible connection 36 which passes beneath the idle roller and over each of the rollers 15 and 16.

While in the foregoing I have shown and described the preferred embodiment of my invention I wish it to be understood that I may make such changes in the combination and arrangement of parts as may fall within the scope of the claim appended hereto.

What is claimed is:—

In a pump operating mechanism, a frame, guides within the frame, a slidable frame mounted to slide on the guides, a piston rod secured to the lower end of the slidable frame, a pulley wheel at each end of the

frame, a flexible member secured to each end of the frame, and passing over its respective pulley wheel, idlers secured intermediate the ends of the frame and guiding the flexible members, a hollow piston rod, and a transverse member at the upper end of the hollow piston rod and forming a connection for the ends of the flexible members opposite those secured to the slidable frame.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK R. HAZARD.

Witnesses:

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J. H. EDWARDS.

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