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S. V. REHART.

PUMPING APPARATUS.

(Application filed Sept. 12, 1898.)

(No Model.)

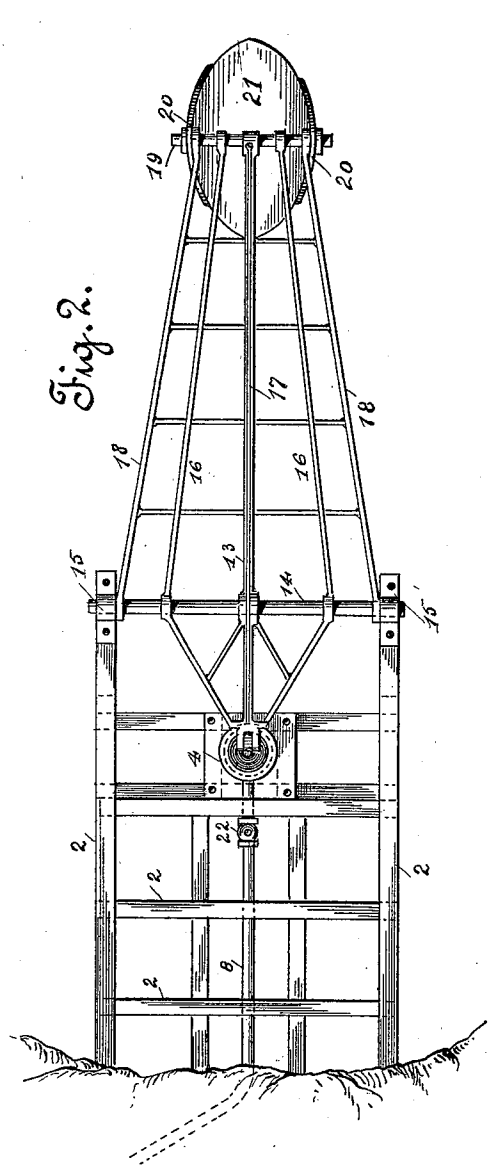


Fig. 2.

Fig. 1.

Witnesses.
F. Montevercle.
Elmer Wickes.

Inventor.
Solomon V. Rehart
by W. A. Ackley
his Atty.

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UNITED STATES PATENT OFFICE.

SOLOMON V. REHART, OF LAKEVIEW, OREGON.

PUMPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 635,390, dated October 24, 1899.

Application filed September 12, 1898. Serial No. 690,772. (No model.)

To all whom it may concern:

Be it known that I, SOLOMON V. REHART, a citizen of the United States, residing at Lakeview, in the county of Lake and State of Oregon, have invented certain new and useful Improvements in Pumping Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof.

This invention relates to a certain new and useful pumping apparatus which is designed to be operated by and to utilize the power of the waves for pumping and raising water from a low level into a reservoir placed a distance from or above the pumping-point; and it consists in the arrangement of parts and details of construction, as will be hereinafter fully set forth in the drawings and described and pointed out in the specification.

The object of the invention is to provide a simple and comparatively inexpensive apparatus for the pumping of water through the medium of the wave-power into a reservoir located at a considerable height above the pumping plant, in which reservoir the water is stored to be used when drawn off for the running of machinery generally. By thus pumping the water into a reservoir a steady power is obtained for the operation of machinery which cannot be secured where the power is obtained by direct communication with the machinery operated by the power of the waves, owing to the variable motion of the said waves.

In order to fully comprehend the invention, reference must be had to the accompanying sheet of drawings, forming a part of this application, wherein—

Figure 1 is a side view in elevation of the entire apparatus, and Fig. 2 is a top plan view of the pumping portion thereof.

In carrying out my invention I first construct a suitable pier or wharf on the shore-line, which wharf or pier is extended into the water for such a distance as to be beyond the breakers. This pier or wharf consists of piles or uprights 1 and timbers 2 and brace-timbers 3. Preferably the said wharf or pier is erected at such point along the shore-line as to be protected as much as possible from the violence of storms in order to reduce the strain to which the same is subjected.

Below the top of the wharf or pier is located the pump 4, the inlet-pipe 5 of which extends downward into the water for such a distance as to be covered or submerged in the water at low tide. This pump is provided with the usual inwardly-opening hinged valve 6 and with the outlet-port 7. With the outlet-opening 7 connects the lower end of the water-pipe 8, which leads upward to and discharges into the reservoir 9, located a distance above the pumping-station. This reservoir is of such size as to hold sufficient quantity of water to be used to run machinery. Said reservoir is provided with a discharge-opening 10, through which the water escapes and is conveyed by means of pipe (not shown) to a water-wheel or other water-actuated device (not shown) in order to be used as a motor-power for machinery. As the power generated greatly depends upon the body of retained water and the fall given thereto, care should be exercised in the building of the reservoir and in the location thereof.

The piston 11 of the pump 4 is connected by means of connecting-rod 12 to the inner end of the fulcrumed lever 13. Through this lever, a distance to the rear of the median line, passes the bearing-rod 14, which rod works in bearings 15, secured at or near the outer edge of the wharf or pier. The fulcrumed rod is so placed that approximately two-thirds of the fulcrumed lever extends beyond the end of the wharf or pier. Consequently a long stroke imparted to the lever at its outer end transmits a short stroke to the piston of the pump. In order to give strength to the fulcrumed lever, the same is thoroughly braced by the inclined side rods 16 and the truss brace-rods 17 and the side rods 18, which lead from the fulcrumed cross-rod 14. The outer end of each brace-rod and the fulcrumed lever are connected to the cross-rod 19, which works in bearings of bracket 20, attached to each side of a buoyant float 21. By reference to Fig. 2 of the drawings it will be observed that the brace-rods of the fulcrumed lever converge toward each other from the cross-rod 14 to the cross-rod 19, thus making the fulcrumed lever wider at its fulcrumed point, considering the brace-rods as constituting a portion of the lever.

This provides a working lever capable of withstanding heavy side strains to which an apparatus of this character is subjected.

While the float suspended from the outer end of the fulcrumed lever may be of any given shape, I prefer that shown as offering the least resistance. Again, the float may be made any size desired and of any material; but I prefer to make the same of metal so constructed as to form a hollow air-tight body. As the float is suspended from the fulcrumed lever by the brackets, the same is free to swing or tilt vertically without interfering with the working of the said lever.

Inasmuch as the fulcrum of the lever is to the rear of its center, the same is overbalanced and the weight thereof, together with that of the float, is sufficient to give the upstroke of the pump-piston as the waves recede. With the uprise of the wave the float and outer portion of the lever are thrown upward, causing the rear end of the lever to move downward, carrying therewith the piston of the pump and forcing the water contained therein upward into the reservoir through the pipe 8. As the float and lever lower with the fall of the waves the piston 11 is moved upward in order to draw water into the pump to be expelled therefrom upon the downstroke of the piston. The water contained in the pipe 8 is prevented from flowing back into the pump upon the upstroke of the piston by means of a clap-valve introduced in the valve-joint 22.

The only power required to successfully operate the present apparatus is sufficient to overcome the weight of the column of water remaining in the pipe 8. As the power to operate the machinery is obtained by the flow of water into the reservoir, the same is a steady one and is not affected by the irregular movement of the pump or the lever, which is the case where the power is taken direct from the float.

In the present application I have only shown one pump as being connected with the fulcrumed lever; but it is obvious that two or more may be so connected, if desired and found advisable during the working of the machine. One might be connected to the rear of the fulcrumed point of the lever, as shown, and a second pump in advance of the same. To so connect the pumps, it is required that the lever be fulcrumed a distance from the edge of the pier or wharf. However, I believe one pump will answer for the required work.

Having thus described my invention, what I claim as new, and desire to secure protection in by Letters Patent, is—

1. In a wave-operated pumping apparatus, the combination of a rigid supporting structure, a lever fulcrumed on said structure, a pump, a float substantially as described hinged to one end of the lever in the path of the waves, and a connection between said lever and the pump-piston for operating the same upon the movement of the lever, substantially as described.

2. In a wave-operated pumping apparatus, the combination of a reservoir, a pump, a conduit from the pump to the reservoir, a rigid supporting structure, a lever fulcrumed on said structure, a float substantially as described hinged to one end of said lever and resting freely on the water, and a connection between the other end of said lever and the pump-piston, substantially as described.

3. In a wave-operated pumping apparatus, the combination of a rigid supporting structure, a laterally and vertically trussed lever fulcrumed on said structure and having the long arm thereof extending out over a body of water, a float hinged to a transverse shaft connecting the ends of the trusses at the outer end of said long arm and freely resting on the water, a pump, and a connection between the short arm of said lever and the pump-piston, substantially as described.

4. The combination with a supporting structure, of a horizontal shaft near the end thereof, a vertically-trussed lever supported by said shaft, a transverse shaft at the outer end of said lever, truss-rods secured to and connecting said two shafts on each side of said vertically-trussed lever, a float hinged on said transverse shaft, a pump, and an operating connection between the pump and said lever, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 19th day of August, 1898.

SOLOMON V. REHART.

Witnesses:

DICK J. WILCOX,

GEORGE C. TURNER.