Nov. 18, 1924. 1,516,349

A. E. RITTENHOUSE

WAVE MOTOR

Filed March 6, 1924

FIG. 1.

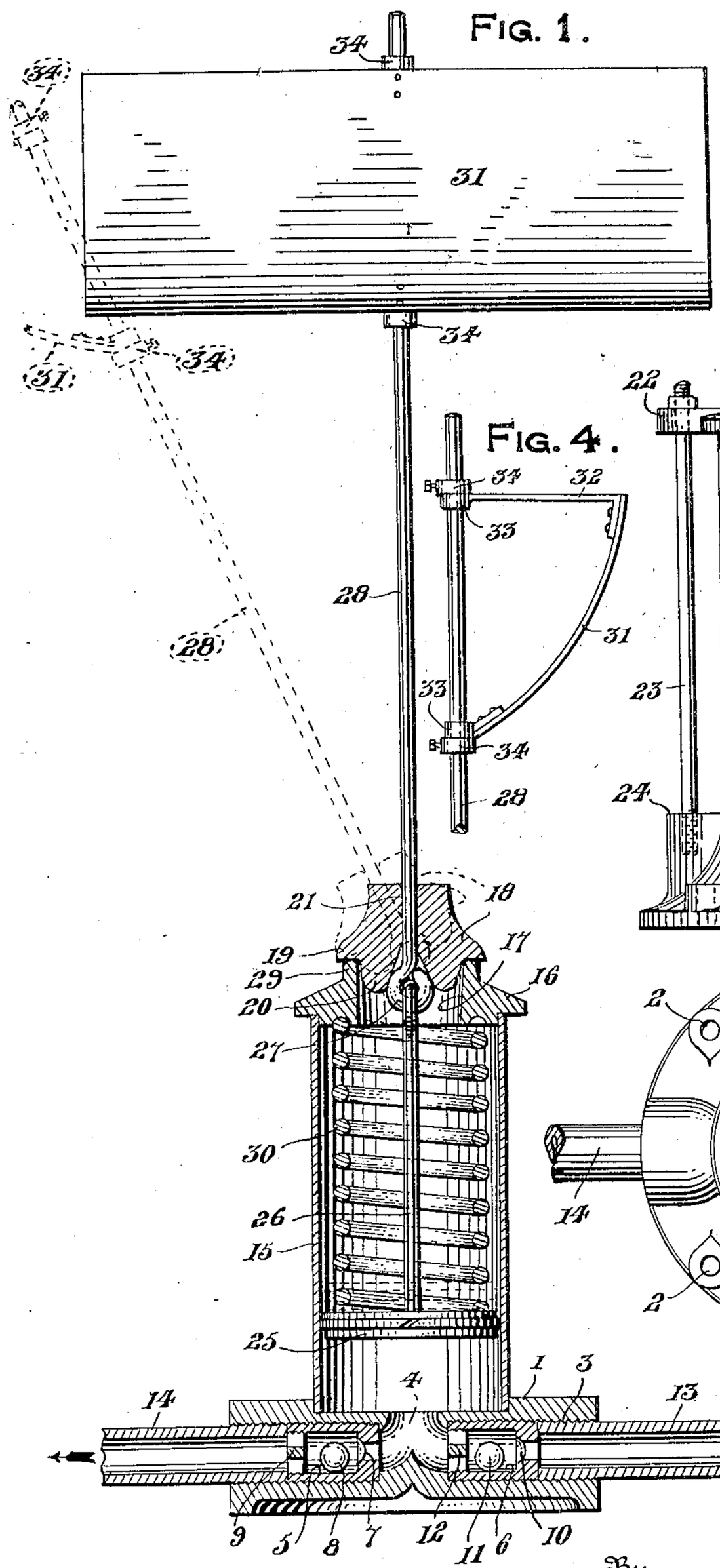


FIG. 4.

FIG. 2.

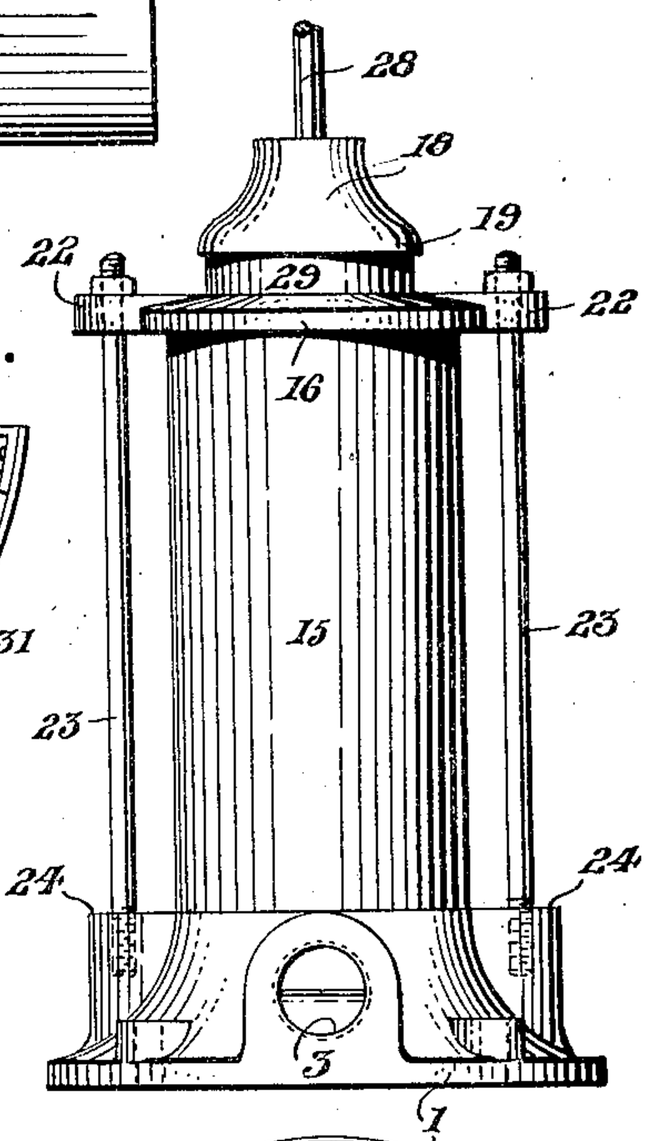
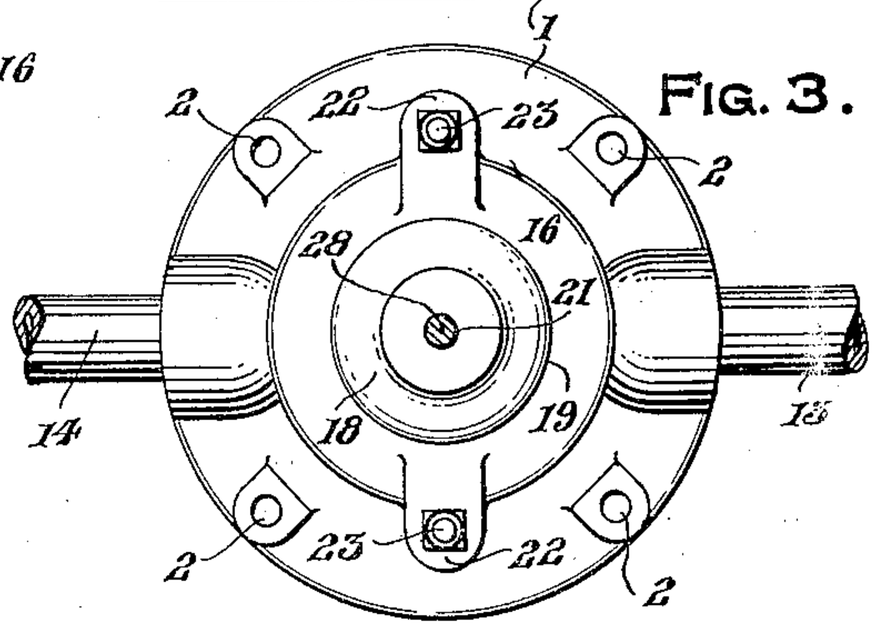


FIG. 3.



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UNITED STATES PATENT OFFICE.

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WAVE MOTOR.

Application filed March 6, 1924. Serial No. 697,240.

To all whom it may concern:

Be it known that I, ARTHUR E. RITTENHOUSE, a citizen of the United States of America, residing at Honeoye Falls, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Wave Motors, of which the following is a specification.

This invention relates to certain new and useful improvements in wave motors and particularly to the type wherein the rise and fall or rolling motion of waves effects operation of a pump device for elevating water to the desired level for reception in a storage tank for use when desired.

The primary object of the invention is to provide a wave motor wherein a spring pressed piston is adapted to be retracted in a cylinder against spring tension thereon by the action of waves or rolling water with the spring forcibly projecting the piston to force water drawn into the lower end of the cylinder to the desired level for storage and use.

With the above and other objects in view that will become apparent as the nature of the invention is better understood, the same consists of the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawing and claimed.

In the drawing, wherein like reference characters designate corresponding parts throughout the several views,

Figure 1 is a vertical sectional view of a wave motor constructed in accordance with the present invention, showing the cylinder containing the spring pressed piston and the wave operated member for shifting the piston, and also the valve mechanism associated with the lower end of the cylinder,

Figure 2 is a side elevational view of the wave motor,

Figure 3 is a top plan view of the same, and

Figure 4 is an elevational view of the upper end of the rod that is attached to the piston rod and upon which the wave operated plate is rotatably mounted.

While the wave motor disclosed in this application is capable of wide and various uses, it has been found to be highly practical when placed near the shore line of the river or lake and operated by the waves for pumping and elevating water to a storage tank for use when desired. The pump may be constructed in any desired size for relatively large and extensive use, and is also capable of being constructed of a comparatively small size for household use in supplying running water in a house. The accompanying drawing showing one embodiment of the invention illustrates a wave motor embodying a base 1 carrying apertured lugs 2 adjacent the edge thereof for anchoring the base to a water bed in any desired manner. The base 1 is provided with diametrically opposite threaded passages 3 that communicate with each other at the center of the base as at 4 and open at the upper side of said base as shown in Fig. 1. Valve cages 5 and 6 are threaded into each of the openings 3 with the inner ends thereof terminating adjacent the central opening 4, the valve cage 5 having an end axial opening 7 adjacent the opening 4 that constitutes a valve seat to be engaged by the ball valve 8 while the outer end of the valve cage 5 is provided with a cross spider frame 9. The valve cage 6 is provided with an axial opening 10 at its outer end that forms a valve seat for the ball valve 11 while transverse spider bars 12 extend across the inner end of the valve cage 6. An inlet pipe 13 is positioned in the threaded opening 3 adjacent the valve cage 6 and an outlet pipe 14 is similarly mounted in the opposite opening 3 adjacent the valve cage 5. The inlet pipe 13 may be extended to the desired point in the body of water, or if desired the inlet pipe may be eliminated while the outlet pipe 14 is continued to a storage tank at the desired elevation and location.

The upper face of the base 1 is provided with a circular recess surrounding the opening 4 that forms a seat for the lower end of the pump cylinder 15, the pump cylinder being anchored therein in any convenient manner and having a head 16 secured in the upper end thereof with a relatively large central opening 17 formed in said head. A block 18 is freely mounted upon the head 16 and is supported thereon by the annular flange 19, the block 18 carrying a depending annular shoulder 20 that surrounds an axial opening 21 in the block. A preferred manner of anchoring the head 16 upon the upper end of the pump cylinder 15 is shown more clearly in Figs. 2 and 3 and includes diametrically opposite ears 22 carried by said

head and through which tie rods 23 extend for anchoring at their lower ends in enlargements 24 formed on the base 1.

A piston 25 is reciprocably mounted within the pump cylinder 15 and carries an upwardly directed piston rod 26 that has a universal connection 27 with the lower end of the rod that extends through the bore 21 of the block 18 with the latter shrunk thereon to form a rigid connection between the lower end of the rod 28 and block 18. The peripheral flange 19 upon the block rests upon the annular shoulder 29 at the upper end of the head and to retain the block 18 in this position with the rod 28 normally vertically disposed there is provided a coil spring 30 within the pump cylinder 15 interposed between the head 16 and piston 25 for normally holding the piston at its limit of downward movement.

The operating means for the pump piston 25 and its associated parts above described, further includes a wave operated plate embodying a curved side section 31 and a horizontal upper section 32, the free edges of which plate sections carry bearings 33 for freely mounting upon the upper end of the rod 28 and retained in vertically adjustable positions by the anchoring collars 34, the wave operated plate being freely rotatable upon said rod for presenting the proper face thereof for action by the waves. While a plate member is herein illustrated as forming the means to be operated by the waves, it is to be understood that a float may be substituted therefor and still be as effective in its operation.

When the wave motor is in the full line position shown in Fig. 1, the spring 30 forces the piston 25 downwardly in its limit of movement and when the plate member carried by the upper end of the rod 28 is shifted by the action of waves contacting the same, the rod 28 and plate member are shifted to the dotted line position, the block 18 substantially pivoting upon the head 16 by the flange 19 of the block rolling over the shoulder 29 of said head thereby elevating the piston 25 against the tension of the spring 30. During this movement, water is drawn into the lower end of the cylinder 15 through the inlet pipe 13 and valve cage 6 and when the wave recedes, the rod 28 is restored to a vertical position and the spring 30 forcing the piston 25 downwardly closes the valve 11 upon its seat 10 and forces the water in the lower end of the pump cylinder 15 through the valve opening 7 and outwardly through the outlet pipe 14 to a storage tank to the desired point. The plate member being freely rotatable upon the upper end of the rod 28, the same automatically rights itself to be properly engaged by a wave. The wave motor may be placed in the desired level of water, according to the length of the rod 28, but it is preferably desired to place the device near the shore line where the waves roll in.

While there is herein shown and described the preferred embodiment of the present invention, it is nevertheless to be understood that minor changes may be made therein without departing from the spirit and scope of the invention as claimed.

What is claimed as new is:—

1. In a wave motor, a pump cylinder, valve-controlled inlet and outlet ports at the lower end of the cylinder, a reciprocating piston in the cylinder, a rocking block at the head of the cylinder, a piston rod extending from the piston to the block, a rod attached to the piston rod and block, wave-operated means upon the upper end of said rod and a coil spring interposed between the piston and cylinder head.

2. In a wave motor, a pump cylinder, valve-controlled inlet and outlet ports in the cylinder, a tensioned piston in the cylinder, wave-operated means attached to the piston for reciprocating the same, said wave operated means including a rocking block, a wave contacting member fixed to the block and disposed upwardly thereof, and a rod connection between the block and piston.

3. In a wave motor, a pump cylinder, valve-controlled inlet and outlet ports in the cylinder, a tensioned piston in the cylinder, wave-operated means attached to the piston for reciprocating the same, a head at the upper end of the cylinder having a central opening surrounded by an annular shoulder, a rocking block supported on the shoulder and extending into the head opening and the connection between the wave-operated means and piston including a rod anchored to the block and a piston rod extending from the piston and connected to the aforesaid rod.

4. In a wave motor, a pump cylinder, controlled inlet and outlet ports for said cylinder, a piston in said cylinder, an oscillatory wave operated means axially pivotally connected to the piston, and a block axially attached to the wave operated means and adapted to fulcrum outwardly of its axis when said means oscillates for reciprocating said piston.

In testimony whereof I affix my signature.

ARTHUR E. RITTENHOUSE.