

No. 833,860.

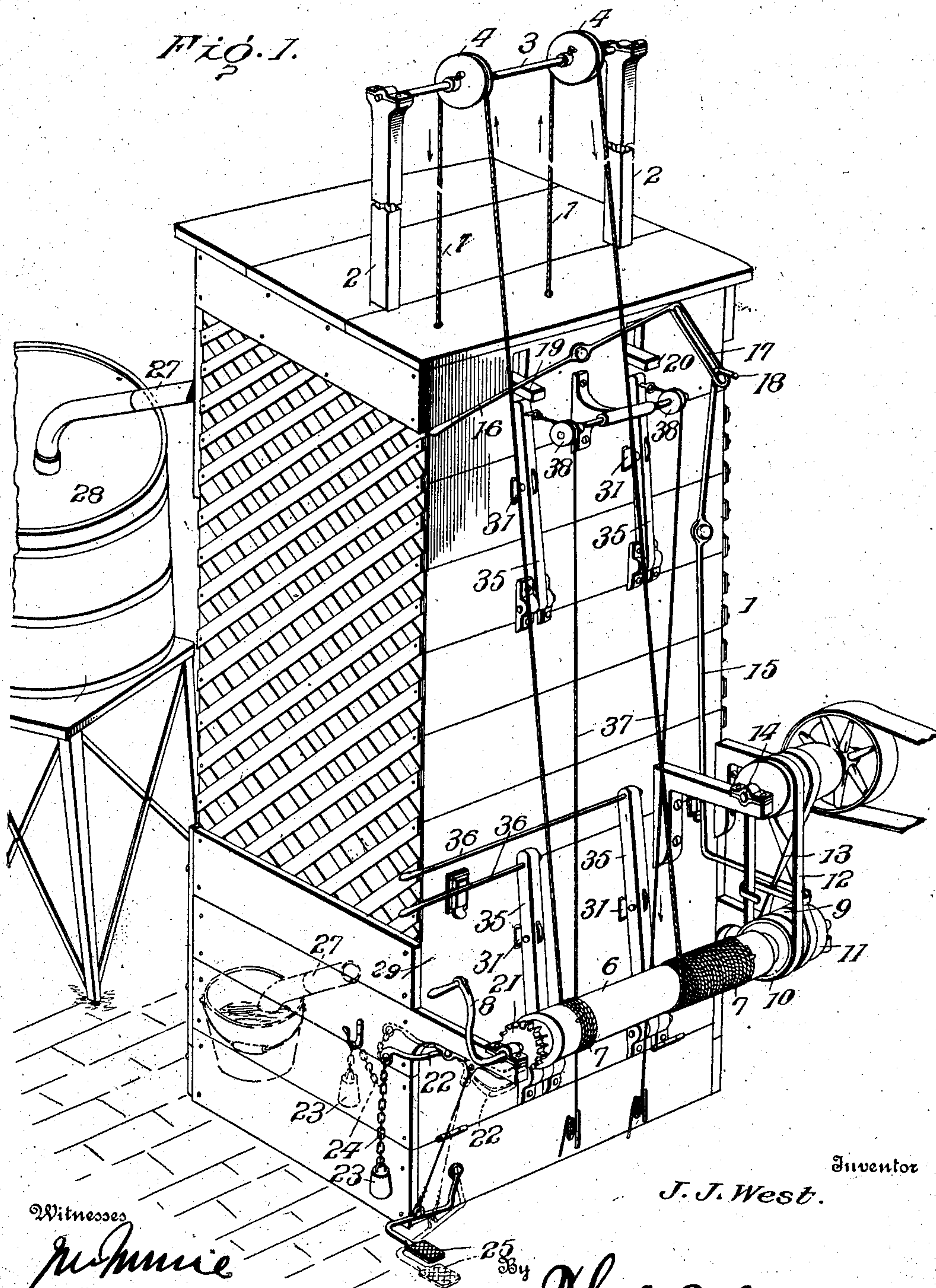
PATENTED OCT. 23, 1906.

J. J. WEST.

WATER ELEVATOR.

APPLICATION FILED SEPT. 22, 1905.

3 SHEETS—SHEET 1.



Inventor

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Witnesses

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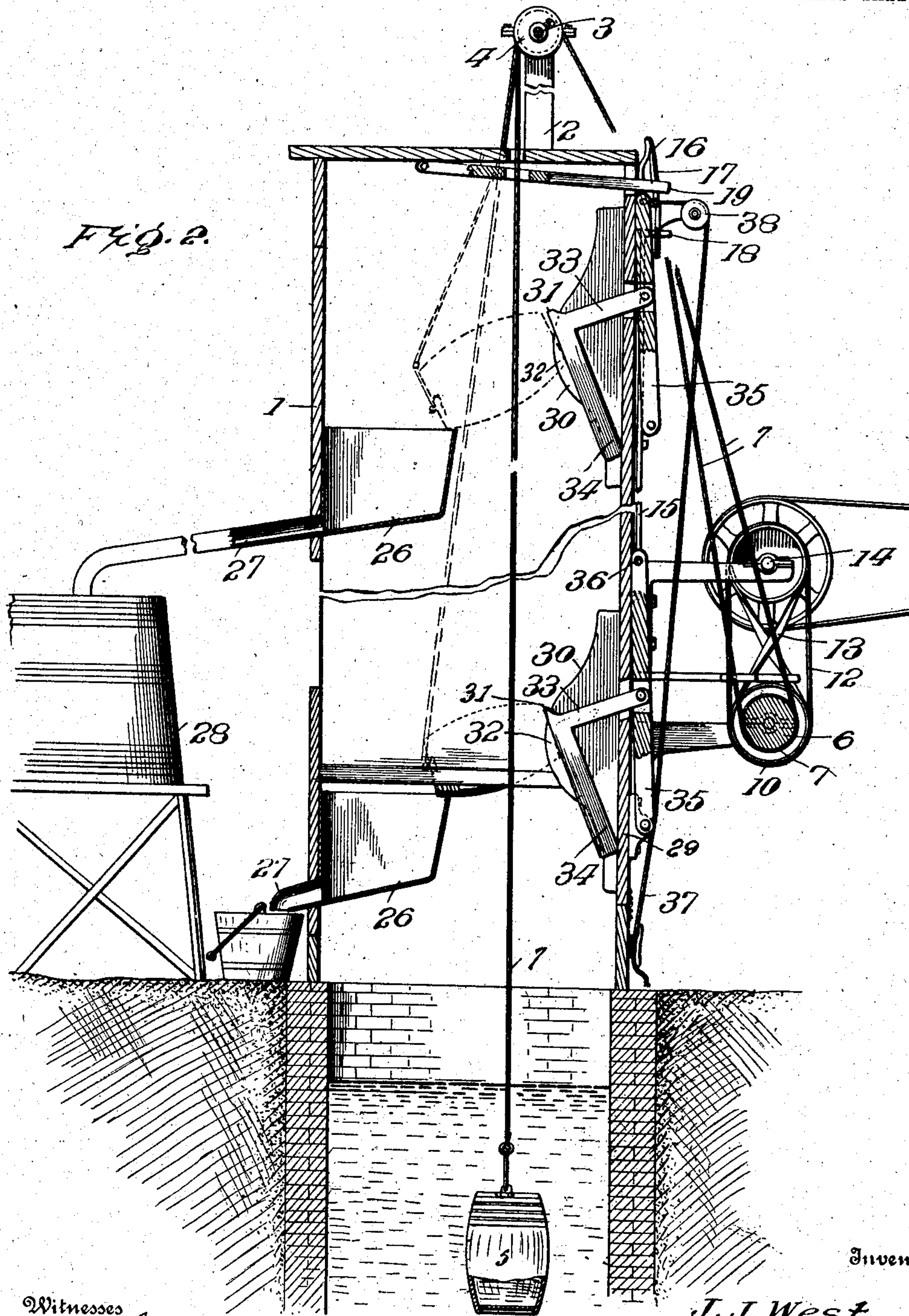
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Inventor

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Witnesses

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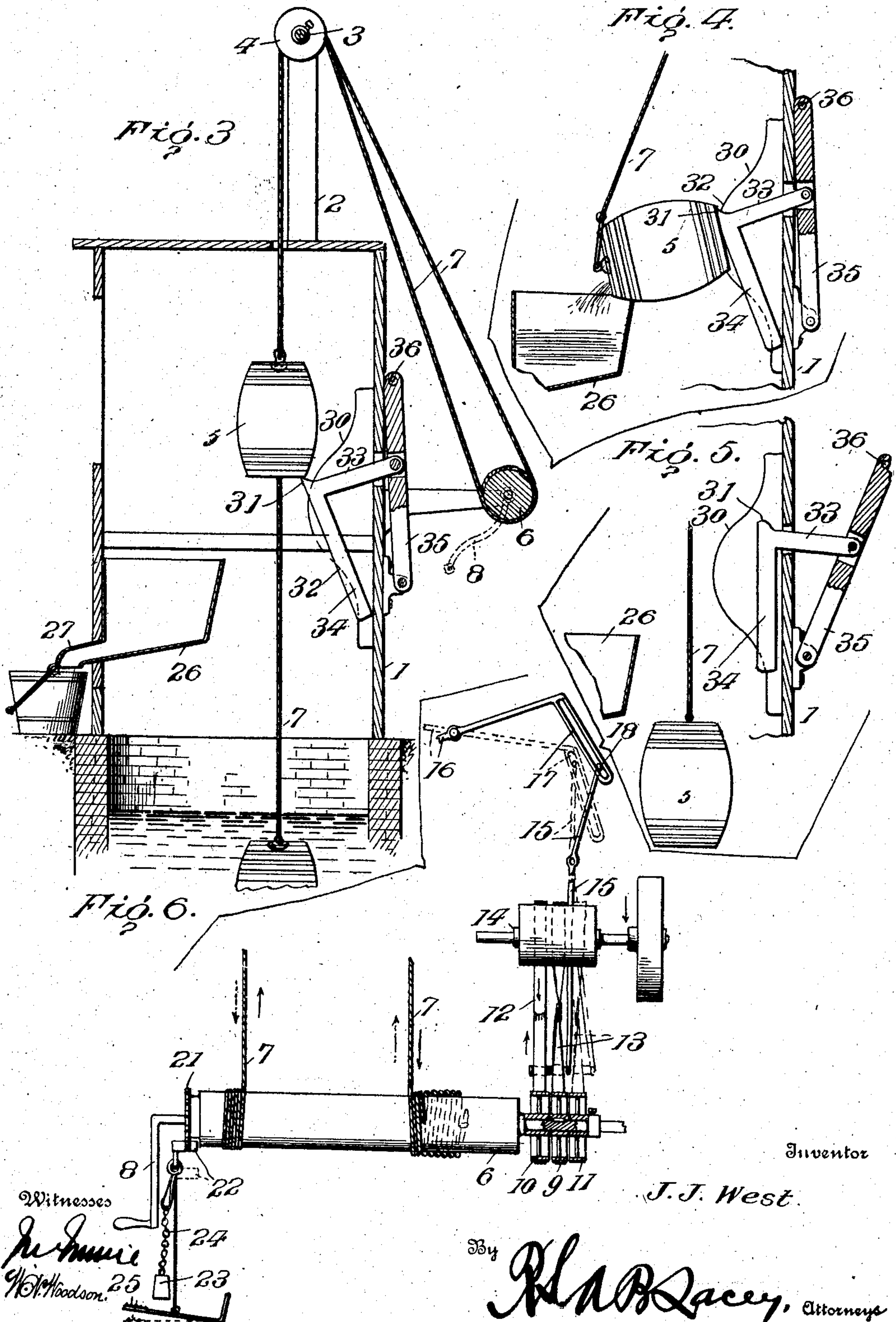
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

JOHN J. WEST, OF INMAN, SOUTH CAROLINA.

WATER-ELEVATOR.

No. 833,860.

Specification of Letters Patent.

Patented Oct. 23, 1906.

Application filed September 22, 1905. Serial No. 279,673.

To all whom it may concern:

Be it known that I, JOHN J. WEST, a citizen of the United States, residing at Inman, in the county of Spartanburg and State of South Carolina, have invented certain new and useful Improvements in Water-Elevators, of which the following is a specification.

This invention belongs to lifting apparatus designed most especially for elevating water from a well, cistern, or like reservoir by means of buckets arranged in the usual manner so that as one bucket ascends the other bucket descends, the buckets being automatically tripped to cause them to discharge their contents.

The invention resides, essentially, in the operating means and trip devices whereby the water may be discharged at different elevations.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which—

Figure 1 is a perspective view of an elevator embodying the invention. Fig. 2 is a vertical sectional view thereof. Fig. 3 is a view similar to Fig. 2 of a modification, showing one trough, a trip mechanism therefor, and a manually-operated windlass, the bucket being in contact with the trip preliminary to being tilted. Fig. 4 is a detail view showing the position of the parts after the bucket has been tilted. Fig. 5 is a view of the parts illustrated in Fig. 4, showing the trip withdrawn and the bucket released and dropped below the trough. Fig. 6 is a detail view showing more clearly the arrangement of the means for shifting the drive-belts by means of which power is transmitted to the windlass from the counter-shaft.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The framework 1 may be of any construction best adapted for supporting the operat-

ing parts and housing the well or other source from which the water is to be elevated. Posts 2 project upward from the framework and support a transverse shaft 3, provided with rude pulleys 4, over which the elevating ropes or cords pass. The hoisting-buckets 5 may be of any size and shape and are suspended from the lower ends of the respective hoisting ropes or cables. The hoisting-buckets 5 have tight bottoms and lower chimes, which are utilized in connection with suitable catches to effect a tilting of the buckets, so as to discharge their contents. A windlass 6 is mounted in bearings forming, in effect, a part of the framework, and the hoisting ropes or cables 7 are attached at one end thereto, so as to wind reversely thereon, whereby as one bucket descends the other bucket ascends. The windlass may be operated either by hand-power or by means of a suitable motor, according to the descent of the apparatus and its manner of operation. When the windlass is to be operated by hand, it is provided with a crank 8, and when operated by power it is provided with a tight pulley 9 and loose pulleys 10 and 11. Drive-belts 12 and 13 connect the pulleys of the windlass with a counter-shaft 14, which is arranged to receive power from a convenient source or suitable motor. The drive-belt 12 is open, whereas the drive-belt 13 is crossed. These belts are caused to alternately cooperate with the tight belt 9, so as to drive the windlass in opposite directions in alternation.

A shipper-lever 15 is arranged to move the drive-belts 12 and 13 and comprises angularly-disposed members, one of said members being pivoted between its ends to the framework 1 and the opposite or horizontal member having its end portion bent to provide opposite folds, which engage with the respective drive-belts. One of the drive-belts is in engagement with the tight pulley, whereas the other drive-belt is in engagement with a loose pulley. Hence one belt only is in active operation at a time. An operating-lever 16, arranged approximately in a horizontal position, is formed with an inclined portion 17, which is adapted to engage with a bent end 18 of the shipper-lever 15 to cause movement of the latter in the operation of the apparatus. The operating-lever 16 is alternately moved by means of trips 19 and 20, which are arranged in the path of the hoisting-buckets to be engaged thereby.

It is advantageous under certain conditions, particularly when the apparatus is to be operated by hand and by children, to provide means for holding the windlass at any desired point, and for this purpose a cog-wheel 21 is fast to an end of the windlass, and a pawl 22 is arranged for coöperation therewith. A weight 23 coöperates with the pawl 22 to normally hold it in engagement with the teeth of the cog-wheel 21, and this weight preferably is connected with the pawl by means of a cord or chain 24 to admit of the weight being placed upon a projecting portion of the framework, thereby permitting the pawl to fall away from the cog-wheel 21 when it is required to have the windlass operate easily in either direction. A treadle 25 is connected with the pawl 22 to be pressed upon when it is required to disengage the pawl from the cog-wheel. The weight 23 normally exerts a force to overcome the weight of the treadle and to hold the pawl in operative engagement with the teeth of the cog-wheel 21. The teeth of the cog-wheel are straight. Hence it is necessary to hold the pawl out of the path thereof when operating the windlass, and this is effected by pressure upon the treadle in the manner stated.

A trough 26 is provided at the elevation determined upon to effect a discharge of the water, and one or more troughs may be employed, according as the water is to be discharged at different levels by the same mechanism. Each trough 26 has a discharge-spout 27. The trough 26 is of a length to admit of each bucket discharging therein. The lowermost trough of a series may have a short spout to discharge the water into a pail or other receptacle, whereas a higher trough may be arranged to discharge into a tank 28 or other reservoir from which water may be drawn at intervals. Guide and trip devices are arranged for coöperation with each trough, and in the event of two or more troughs being provided for a single apparatus the guide and trip devices below the uppermost set are attached to a movable support 29, which is preferably a part of the framework and hinged thereto, whereby said devices may be thrown out of the path of the buckets and admit of the same passing thereby to the upper guide and trip devices corresponding with the trough into which the water is to be discharged. A trip and guide are had for each trough and hoisting-bucket. The guide comprises companion members 30, spaced apart to receive between them the trip or catch 31, and each of said members having the edge facing inward sloped or curved from a point 32 between its ends toward each extremity, the projecting portion 32 extending across the path of a side of the hoisting-bucket or approaching the same so closely as to prevent lateral tipping of the

bucket when tilting upon the trip or catch 31 preliminary to effecting a discharge of the water. The guide therefore insures a forward tilting of the hoisting-bucket to insure discharge of the water into the trough. The slope of the guide away from the path of the hoisting-bucket below the projecting part 32 provides ample clearance for the bucket when tilting forward.

The trip or catch 31 is preferably of L form and comprises the arms or members 33 and 34, the arm 33 being approximately horizontal, whereas the arm 34 inclines slightly from the vertical and obtains a bearing at its lower end against the support 29, said arm acting as a brace or stay to sustain the weight of the hoisting-bucket and its load during the tilting operation when effecting a discharge of the water. A lever 35 is connected with the horizontal arm 33 of each trip or catch 31 and serves as convenient means for effecting disengagement of the trip or catch from the hoisting-bucket after the latter has discharged its load, so as to permit the bucket to descend into the well or other place from which the water is to be elevated. A rod 36 may extend from each lever 35 to a side of the framework to serve as convenient means for operating the lever and catch, or a rope or cord 37 may answer the same purpose and is of essential advantage when the trip devices are located overhead beyond reach. The rope or cord 37 after passing over a guide-pulley 38 extends within easy reach of the person operating the apparatus. Each trip or catch 31 has a point at the angle formed between the arms or members 33 and 34 for engagement with the chime or like part of the hoisting-bucket, the engaging parts being so constructed as to insure a complete discharge of the water before the bucket is released to again descend into the well or cistern. By relatively disposing the trip or catches with reference to the trough and the length of the hoisting-buckets the latter may be caused either to automatically disengage themselves from the trips or may be supported by the trough and trip until the latter is released by hand either by pulling upon the rope or cord 37 or pressing upon the rod 36. When the apparatus is constructed for manual operation solely, it is preferred to have the trips 31 and trough arranged in such a manner as to require release of the hoisting-buckets by operation of the trips by hand; but when the apparatus is intended to be operated by power derived from a suitable motor the trough and trips are arranged to admit of automatic disengagement of the hoisting-buckets from the trips. This result is accomplished by locating the trough at such a distance from the trips as to admit of the hoisting-buckets in their descent engaging with the trips only.

Having thus described the invention, what is claimed as new is—

1. In hoisting apparatus of the character specified and in combination with the hoisting-bucket, a catch or trip therefor comprising angularly-disposed members, one of said members normally inclining to the perpendicular and constituting a brace.

2. In a hoisting apparatus of the character specified and in combination with the hoisting-bucket, a catch or trip therefor comprising angularly-disposed members, one of said members normally inclining to the perpendicular and constituting a brace, and a lever having the other member connected thereto.

3. In a hoisting apparatus of the character specified and in combination with the hoisting-bucket, a catch or trip therefor comprising angularly-disposed members, one of said members normally inclining to the perpendicular and constituting a brace, a lever having the other member connected thereto, and means for positively operating said lever to effect disengagement of the catch from the bucket.

4. In hoisting apparatus of the character set forth, the combination of a hoisting-bucket suspended by a rope and free to swing in all directions, a catch arranged in the path of the bucket to effect a tripping thereof, and a fixed guide at one side of the path of travel of said bucket to come in contact therewith when tilting to steady its movement and prevent lateral displacement.

5. In hoisting apparatus of the character specified, the combination of a hoisting-bucket suspended by a rope and free to swing in all directions, a catch arranged in the path of the bucket to effect a tripping thereof, and a fixed guide at one side of the path of travel of said bucket to come in contact therewith when tilted to prevent lateral displacement of the bucket during its tilting

movement, said fixed guide comprising spaced portions arranged upon opposite sides of the trip.

6. In hoisting apparatus of the character specified, the combination of a hoisting-bucket suspended by a rope and free to swing in all directions, a catch arranged in the path of the bucket to effect a tripping thereof, and a fixed guide at one side of the path of travel of said bucket to come in contact therewith when tilted to prevent lateral displacement of the bucket during its tilting movement, said fixed guide having the portion below the engaging point of the trip sloping away from the path of the hoisting-bucket to provide ample clearance therefor.

7. In hoisting apparatus of the character specified, the combination of a hoisting-bucket suspended by a rope and free to swing in all directions, a catch arranged in the path of the bucket to effect a tripping thereof, and a fixed guide at one side of the path of travel of said bucket to come in contact therewith when tilted to prevent lateral displacement of the bucket during its tilting movement, said fixed guide sloping in opposite directions from a point opposite to the engaging part of the trip, substantially as and for the purpose specified.

8. In hoisting apparatus of the character described, the combination of a hoisting-bucket, trip and guide devices for coöperation therewith, and a movable support for said trip and guide device to enable the latter being thrown out of the path of the hoisting-bucket.

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

JOHN J. WEST. [L. s.]

Witnesses:

B. B. BISHOP,

E. C. CANTRELL.