J. JONES & J. F. HOLMES.

WATER-ELEVATOR.

No. 172,445. Patented Jan. 18, 1876.

Fig. 1.

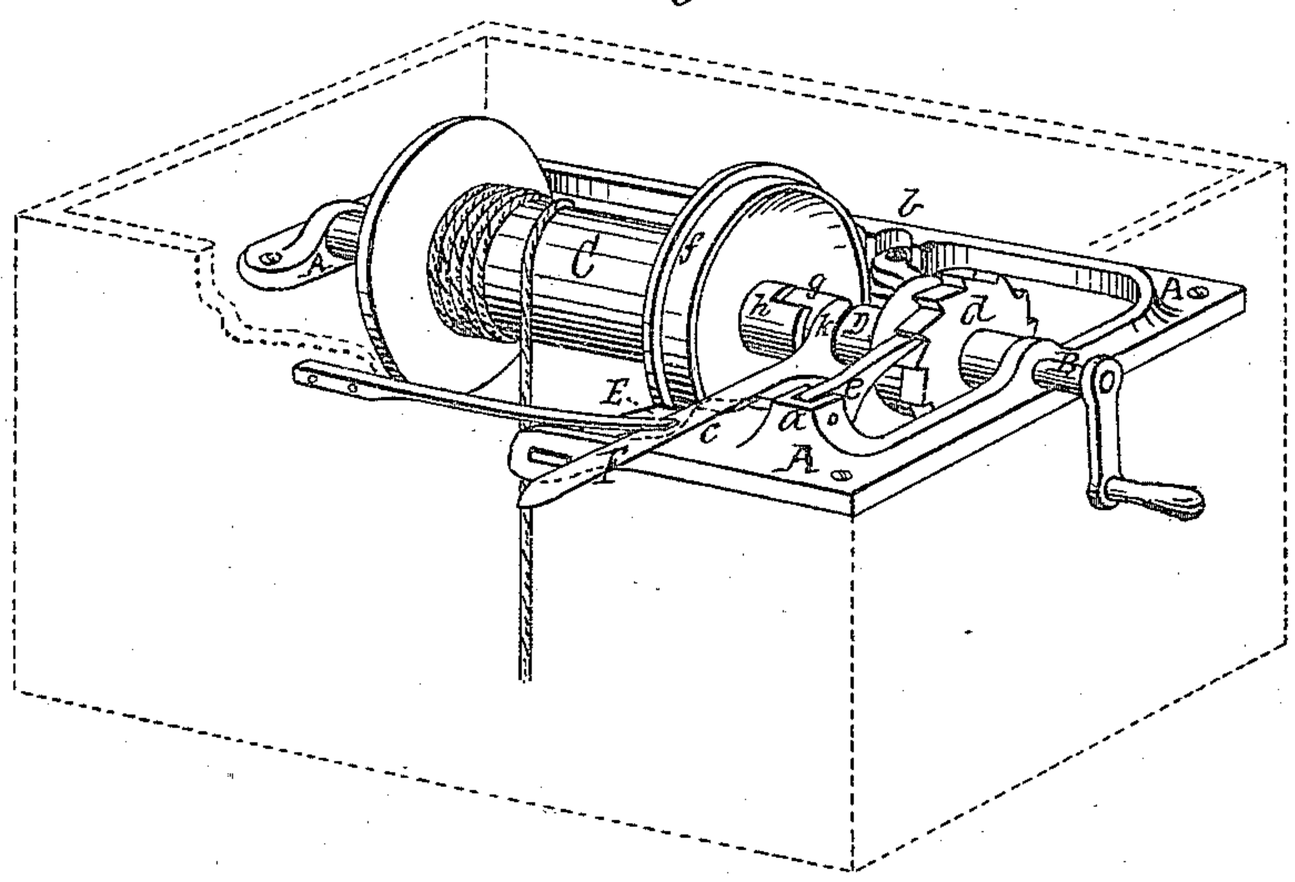


Fig. 2.

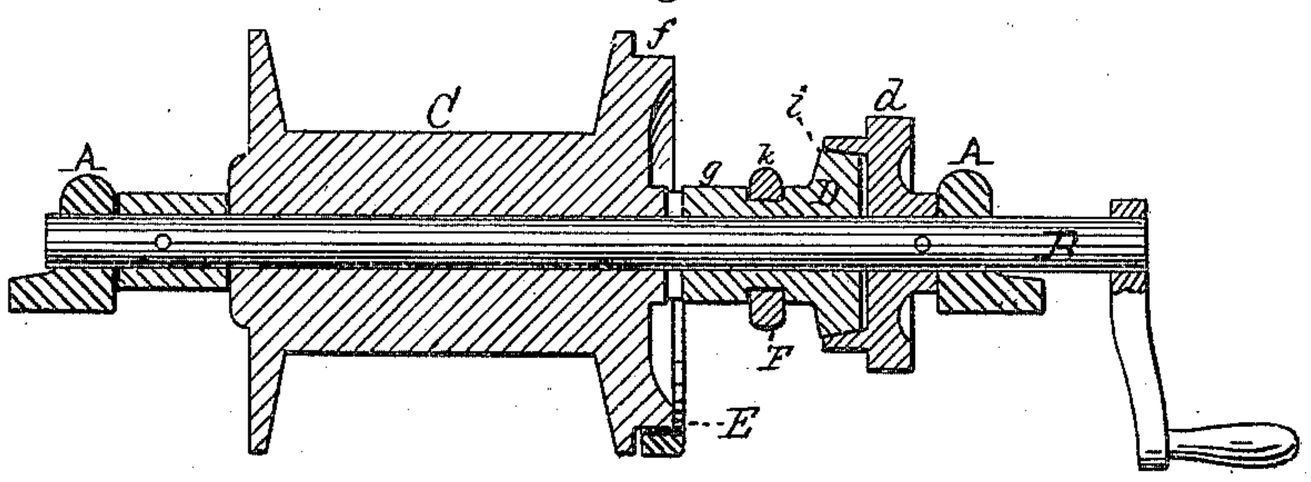


Fig. 3.

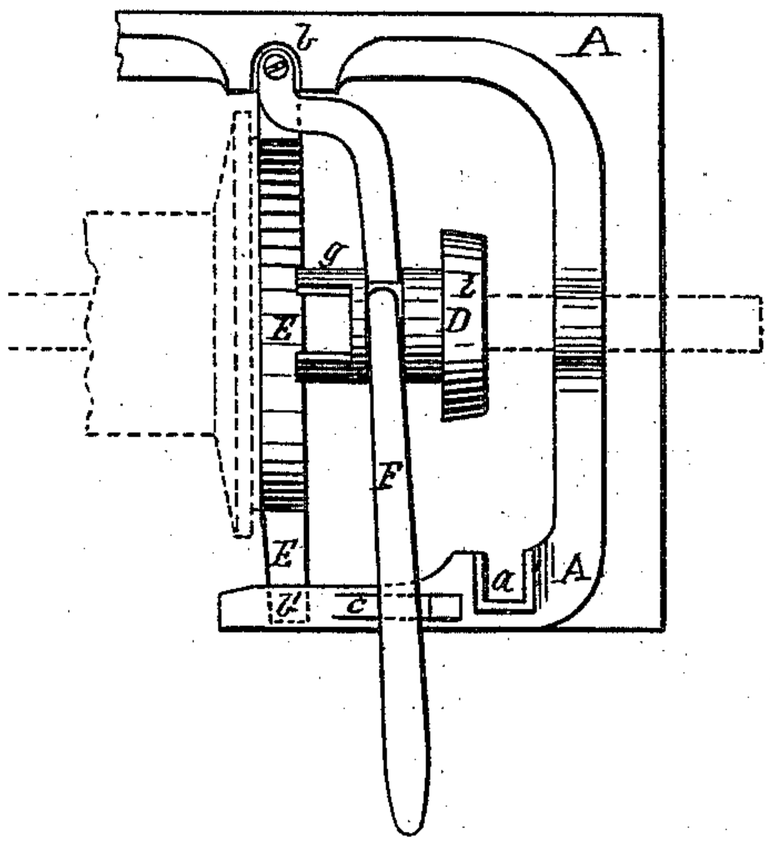
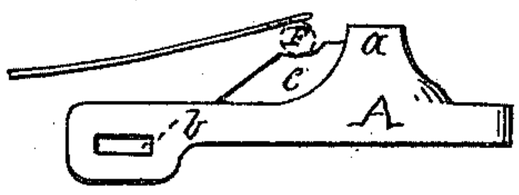


Fig. 4.



Witnesses:
Philip F. Larner
A. B. Cauldwell

Inventor:
Jenkins Jones.
Jason F. Holmes
By Atty Wm. G. Wood.

UNITED STATES PATENT OFFICE.

JENKINS JONES AND JASON F. HOLMES, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN WATER-ELEVATORS.

Specification forming part of Letters Patent No. **172,445**, dated January 18, 1876; application filed October 28, 1875.

To all whom it may concern:

Be it known that we, JENKINS JONES and JASON F. HOLMES, both of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Water-Elevators; and we do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description thereof.

Our said improvements relate to that class of water-elevators which are mounted in a well-curb, and involve the use of a drum, crank-shaft, rope, and bucket.

The object of our invention is to provide a simple and effective means for controlling the descending bucket, and for operatively connecting the windlass-drum with the crank-shaft when the filled bucket is to be raised.

Our invention consists partially in the novel combination, with a crank-shaft and a drum, longitudinally fixed, but rotatively mounted loosely, on said shaft, of a ratchet-wheel secured to the shaft, a sliding clutch between ratchet and drum, a friction-shoe lever, and a double-acting hand-lever, attached to the shoe-lever and connected with the clutch, whereby the descending bucket may be readily controlled and the shaft and drum rotatively connected or disconnected. Our invention further consists in the novel combination, with a crank-shaft or other driving-shaft, of a longitudinally-fixed drum, loosely mounted on said shaft, provided with a peripherical friction-surface, a friction-shoe lever, a friction-clutch, and a lever arranged to operate in two planes—vertically for controlling the friction-shoe, and laterally for controlling the clutch; and, still further, in the combination, with the double-acting lever which controls the clutch and the friction-shoe, of a stop-plate having an inclined surface, with which the lever engages when it is moved laterally, and by which the outer end of the lever is raised for connecting the clutch and placing the frictional shoe out of operative position, and which permits the outer end of the lever to descend when moved in the opposite lateral direction for disconnecting the clutch and placing the frictional shoe into a controlling connection with the drum.

To more particularly describe our invention, we will refer to the accompanying drawings, in which—

Figure 1 represents, in perspective, a water-elevator embodying our invention, in which a portion of the well-curb is indicated by dotted lines. Fig. 2 represents the windlass and its frame in longitudinal central section. Fig. 3 represents, in top view, the double-acting lever, clutch, and friction-shoe, a portion of the frame, and also, in dotted lines, the crank-shaft. Fig. 4 represents, in side view, a stop-plate.

Our apparatus is preferably mounted upon a metallic frame, as at A, having two bearings for the crank-shaft, a standard at *a* for a pawl, a recess for one end of the lever, as at *b*, and a recess opposite thereto, as at *b'*, for the friction-shoe, and the stop-plate, as at *c*.

These several features could, of course, be embodied in a wooden frame, or could be separately constructed and properly attached to a well-curb.

B denotes the driving-shaft, which may be rotated directly by a crank, or by a crank with intermediate gearing. It is provided with a ratchet-wheel, as at *d*, and the pawl, as at *e*, for preventing backward rotation. C denotes the drum, which is longitudinally fixed, but is loosely mounted, on the main shaft. It is provided, at the end nearest the crank, with a peripherical frictional surface, as at *f*. The side of the ratchet-wheel *d* adjacent to the drum is concaved, so as to constitute it the receiving member of a friction-clutch. D denotes a sliding entering member of a frictional clutch. It is provided with two lugs, as at *g*, which enter the spaces between corresponding lugs, as at *h*, which project from the head of the drum closely adjacent to the crank-shaft. This member of the clutch (usually in itself denominated "the clutch") is always rotatively connected with the drum, and is only connected with the crank-shaft when forced toward the ratchet-wheel, and its annular frictional inclined surface at *i* made to enter and frictionally engage with the correspondingly-inclined interior surface in the concave portion of the ratchet-wheel. E denotes the friction-shoe lever, which, at its front end, enters into the recess *b'* in the frame

A, and the recess *b* at its rear end. It has a concave upper surface, which inversely corresponds with the annular frictional surface on the drum at *f*, with which it is made to engage for retarding the rotation of the drum during the descent of the bucket. F denotes a controlling-lever of peculiar construction and operation. It has two fulcra, one of which is located at one end of the lever, and the other at a point between its two ends. This lever controls both the friction-shoe and the clutch. The shoe-lever is actuated by movement of the rear end of the lever in a vertical plane, and the clutch by a lateral movement of the outer end of the lever.

It has been before stated that the rear end of the friction-shoe lever E occupies a recess at *b* in the frame. This recess is open at top and bottom. The rear end of the lever F is pivoted to the rear end of the shoe, and therefore that end of both lever and shoe may be moved in a vertical line, but not laterally, and therefore the sides of this recess constitute surfaces or fulcra, against which the lever acts when its outer end is moved laterally. At the point where the lever crosses the line of the crank-shaft said lever is provided with a hooked arm, as at *k*, which partially embraces the clutch D, and occupies an annular recess therein. As a lever, therefore, it has an intermediate fulcrum on the crank-shaft, of precisely the same character as if the shaft passed through a hole in the lever.

When the outer end of the lever is raised the under side of the clutch, with which the lever engages, constitutes a fulcrum, and, on the other hand, when said lever at its outer end is depressed, the upper side of the clutch, with which the hooked arm *k* engages, constitutes the fulcrum. It will be seen, therefore, that when the lever is used for moving the clutch that its lateral fulcrum is at the recess *b*, and that when the shoe is to be depressed or raised that the fulcrum is shifted to the crank-shaft on which the clutch is mounted.

Whether a toothed clutch or a pin-clutch be employed instead of a friction-clutch, as shown, this lever performs a valuable and novel service, and constitutes, in combination with any form of clutch, friction-shoe, or drum, with a frictional surface, one of the prime features of our invention.

For rendering the apparatus efficient and of more general utility it is desirable that the control of the loose drum be confined, as far as possible, to the automatic action of the controlling device. It is obvious that a prudent person could safely be relied upon to detach the clutch and then promptly depress the lever, so as to maintain proper relations between the shoe and drum for controlling the latter; but, to render this control more automatic in its nature, we combine with the lever the stop-plate, as at *c*. In this instance the stop-plate is cast with the frame A, although it may be separately constructed, and placed adjacent to the necessary opening in the front of the curb, through which the outer end of lever F projects. At *l*, on the stop-plate, is a bearing-surface for the lever when it has been moved laterally for connecting the clutch. This surface is approached by an inclined surface at *m*, which secures an upward movement of the outer end of the lever when it is moved laterally toward the clutch, and a corresponding depression of its rear end, whereby the friction-shoe is moved downward and kept free from contact with the drum. When moved laterally away from the bearing-surface *l* the outer end of the lever descends along the inclined surface until it rests upon the frame A. The rear end of the lever is thereby elevated, and the friction-shoe made to engage with the drum almost simultaneously with the disconnection of the clutch.

For maintaining the lever on the bearing-surface *l* and keeping the clutch connected, a spring may be employed in a manner well known.

In practice, the outer end of the lever F may be made of such weight that no downward force need be exerted thereon for causing the shoe to properly engage with the drum, because the shoe is, in itself, a lever, having its fulcrum in the recess *b'* in the front portion of the frame.

With a light lever a spring may be successfully employed for inducing the desired degree of downward-pressure on the lever, and we show, in dotted lines in Fig. 1, at *n*, a long, straight spring, which may be secured to the interior of the front side of the curb and arranged to perform the double service of holding the front end of the lever on the bearing-surface *l* when the clutch is connected, and also of depressing the lever and raising the shoe when the clutch is disconnected.

The friction-clutch, as herein shown, is a well-known connecting device, but we are not aware that, prior to our invention, such a clutch was ever before employed in a like combination of mechanism. It has a special value in this connection, because it is silent in its operation, capable of a gradual instead of an abrupt connection, and is not liable to be broken when it is thrown into gear, while the drum is freely revolving. Moreover, it is of itself a frictional device, which would gradually check the revolution of the drum in case the shoe should become inoperative. We are, however, aware that coincident, inclined-faced, concavo-convex disks have heretofore been employed as frictional devices in connection with a drum loosely mounted on a shaft and a toothed clutch, and we are also aware that frictional shoes have been employed in various connections for retarding the revolution of drums in water-elevators, as well as in windlasses in general.

With the foregoing description of the several parts, and the function of each, it will be readily seen that the drum, in lowering the bucket, is controlled through the friction-shoe and the downward pressure of the outer end

of the lever, and that, when the bucket is filled, the lateral movement of the lever and the attendant depression of its rear end connects the clutch and removes the shoe from contact with the drum, after which, by the rotation of the crank-shaft, the bucket is raised.

Having thus described our invention, we claim as new and desire to secure by these Letters Patent—

1. The combination, with a crank or driving-shaft, and a drum longitudinally fixed, but loosely mounted, on said shaft, and provided with a peripherical frictional surface, of a ratchet-wheel secured to the shaft, a sliding clutch between ratchet-wheel and drum, a friction-shoe lever, and a double-acting lever attached to the friction-shoe lever and connected with the clutch, substantially as described.

2. The combination, with a crank-shaft or driving-shaft, and a drum longitudinally stationary, but loosely mounted, on said shaft, and provided with a peripherical frictional surface, of a friction-shoe lever, a friction-clutch, and a lever arranged to operate vertically for controlling the shoe-lever, and laterally for controlling the clutch, substantially as described.

3. The combination, with a crank or driving-shaft, a drum loosely mounted on said shaft, a clutch for connecting the drum and shaft, a friction-shoe for engaging with the drum, and a lever for alternately controlling the clutch and the shoe, of a stop-plate provided with an inclined surface and a bearing-surface, substantially as described, whereby the free end of the lever, when moved laterally in one direction, will be elevated and held on the bearing-surface, and when moved in the opposite direction will be allowed to fall, as set forth.

JENKINS JONES.
JASON F. HOLMES.

Witnesses:
CHARLES SELDEN,
JOHN C. PURKIS.