No. 789,629. PATENTED MAY 9, 1905.

M. V. RUFF & R. C. IRWIN.

WATER ELEVATOR.

APPLICATION FILED OCT. 10, 1904.

Fig. 1.

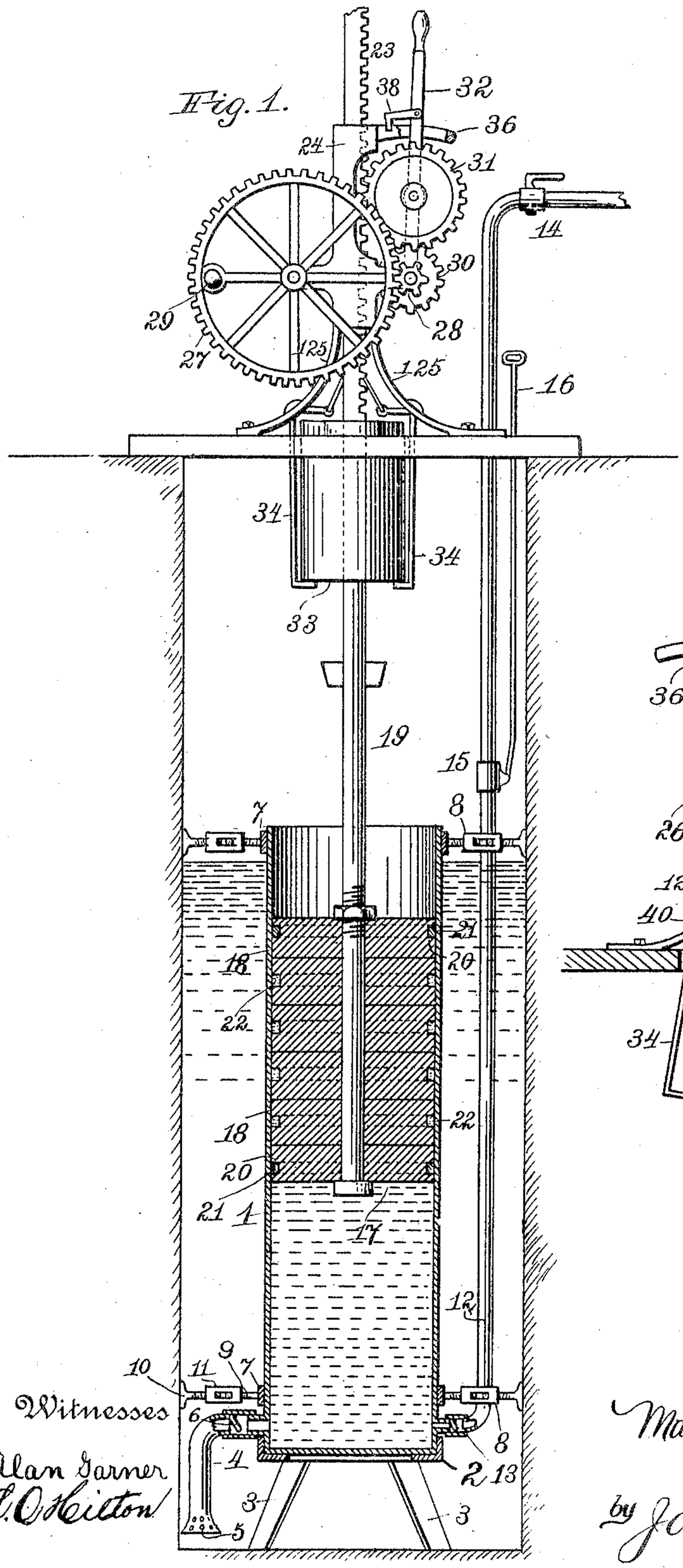
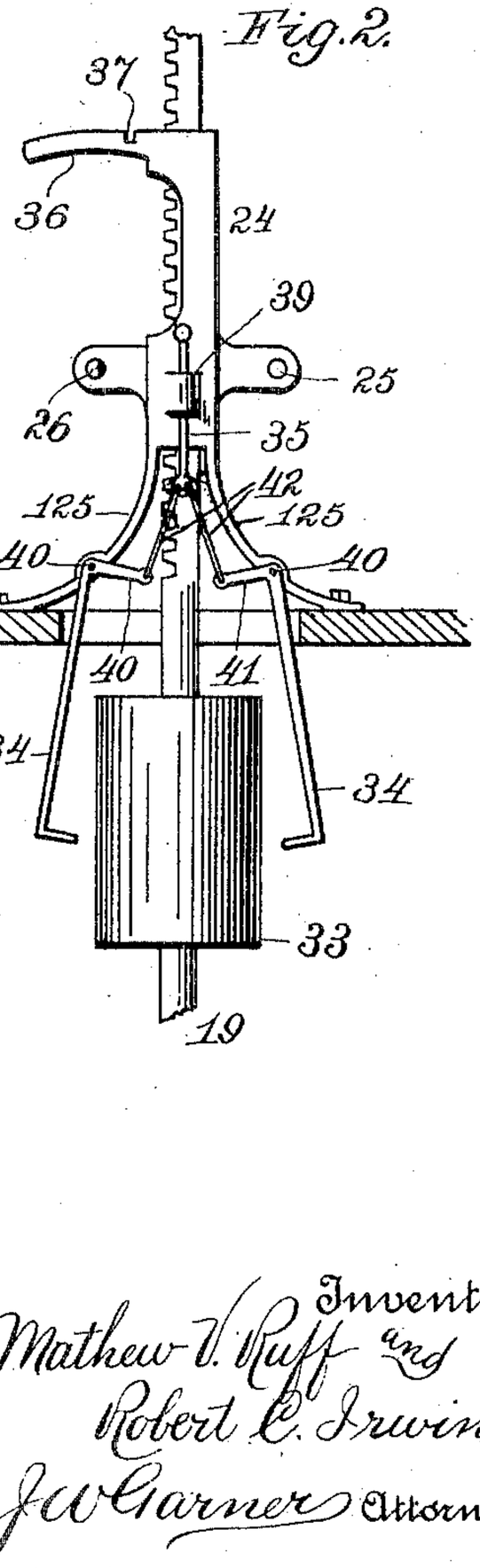


Fig. 2.



Witnesses

Alan Garner

L. O. Hilton

Inventors

Mathew V. Ruff and

Robert C. Irwin

by J. W. Garner Attorney

No. 789,629. Patented May 9, 1905.

UNITED STATES PATENT OFFICE.

MATHEW V. RUFF, OF SMYRNA, AND ROBERT C. IRWIN, OF MARIETTA GEORGIA.

WATER-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 789,629, dated May 9, 1905.

Application filed October 10, 1904. Serial No. 227,971.

To all whom it may concern:

Be it known that we, MATHEW V. RUFF, residing at Smyrna, and ROBERT C. IRWIN, residing at Marietta, in the county of Cobb and State of Georgia, citizens of the United States, have invented certain new and useful Improvements in Water-Elevators, of which the following is a specification.

Our invention is an improved water-elevator; and it consists in the construction, combination, and arrangement of devices hereinafter described and claimed.

The object of our invention is to provide an improved water-elevator which is adapted to maintain a column of water at the bottom of a well or cistern, where it is cool, at a pressure sufficient to cause the water to be forced to any portion of a house where it may be desired to use the water and without employing a tank for the storage of the water.

In the accompanying drawings, Figure 1 is partly a vertical sectional view and partly an elevation of a water-elevator embodying our improvements. Fig. 2 is a detail elevation, partly in section, showing the opposite side of the standard from that shown in Fig. 1 and also showing a portion of the plunger-operating rod, the supplemental weight, the hangers, and their operating connections, the hangers being shown in open position and the supplemental weight being shown as dropping therefrom.

In the embodiment of our invention we provide a water-cylinder 1 of sufficient capacity, which is located at the bottom of a well or cistern and is supported on a base 2, having legs 3. The lower end of the water-cylinder is closed, and it is provided with a downwardly-extending induction-pipe 4, having a perforated intake-funnel 5 and provided with a suitable valve, as at 6. On the cylinder at its upper and lower ends are bands 7, provided with radial extensible braces 8, each of which comprises an inner section 9, an outer section 10, which are oppositely screw-threaded, and a connecting-sleeve 11, which has a bore oppositely screw-threaded at its ends to receive the threaded ends of said sections. By turning said sleeves the said braces may be lengthened or shortened, and hence they may be so adjusted as to support the water-cylinder in a perfectly vertical position. The said extensible braces also enable the water-cylinder to be readily placed in the well or cistern and also readily removed therefrom.

From the lower end of the water-cylinder extends a water-discharge pipe 12, which passes up through the platform at the top of the well or cylinder and may lead to any desired point. It is provided with a valve, as at 13, and is also here shown as provided with a faucet 14 At a suitable distance below the mouth of the well or cistern the pipe 12 is provided with a drain-valve 15, which may be opened or closed by a rod 16. The function of this valve is to prevent the water in the pipe 12 from freezing during cold weather.

A weight-plunger operates in the water-cylinder, and is here shown as comprising a number of sections 18, secured together by the operating-rod 19, the lower end of which passes through the said sections and is screwed thereto. The sections of the plunger are preferably made of iron. Said plunger is provided at its upper and lower ends with annular circumferential channels 20, in which are secured packing-rings 21, made of leather or other suitable material. At suitable distances apart the weight-plunger is provided with annular circumferential water-channels 22, which are filled with water, contribute greatly to the packing of the plunger, and also minimize friction between it and the cylinder. When the plunger is raised, it creates a partial vacuum in the cylinder and causes the latter to become filled with water, the same being supplied to the cylinder through the valved induction-pipe 4. The plunger is of such weight as to subject the column of water in the cylinder to such pressure as to cause the water to flow through the service-pipe 12 to the point where it is used, it being only necessary to open the faucet 14 in order to obtain a supply of water.

The upper portion of the plunger-operating rod 19 has a rack 23 and reciprocates vertically in a tubular-standard guide 24, which has supporting-legs 125 secured on the platform at the top of the well or cistern. Said standard has bearings 25 26 for the axles of a spur-wheel 27 and a pinion 28, respectively. Said pinion engages the said spur-wheel, and the latter is provided with a hand-crank 29, whereby it may be rotated manually. A spur-wheel 30 is fast to and turns with the pinion and is engaged by a shiftable gear 31, the bearing of which is movable concentrically with reference to the gear 30, so that the said gear 31 may be moved into and out of engagement with the rack 23. A lever 32 is provided to thus move the shiftable gear. The said lever is pivotally connected to the standard 24, the pivot of the lever being also the axle of the pinion 28 and gear 30, which axle is journaled in the bearing 26. The standard is shown as having a slotted guide-arm 36, through which the lever extends. Said guide-arm has a notch 37 in its upper side, and the lever has a hook 38 to engage said notch, and thereby lock the lever in the position required to keep the gear 31 in engagement wth the rack 23 when the weight-plunger is being raised. To raise the plunger, the gear 27 is turned in one direction, the shiftable gear having been put into engagement with the rack. When the plunger has been raised, the shiftable gear is then moved out of engagement with the rack, thus causing the plunger to bear with its entire weight on the column of water in the cylinder and enabling the plunger to descend in the cylinder as water is drawn therefrom.

In order to obtain an increased pressure of water in the cylinder and the service-pipe for use in cases of emergency, we provide a supplemental weight 33 of annular form, which is guided on the rod 19 and normally supported in an elevated position by hangers 34. These hangers may be moved to release the supplemental weight by means of a rod 35, when the supplemental weight will immediately drop on the rod 19 and add its weight to that of the weight-plunger and increase the pressure of the water in the cylinder and the service-pipe. The rod 35 passes through and is held by a guide-lug 39 on one side of the standard. The hangers, which are here shown as pivotally suspended, as at 40, from the legs 125 of the standard, have crank-arms 41 at their upper ends, which are connected to the said rod by links 42. When the supplemental weight is raised, together with the weight-plunger, it engages the said crank-arms and causes the hangers to turn automatically to the required position (shown in Fig. 1) to reëngage the supplemental weight and support the same in elevated position.

Having thus described our invention, we claim—

1. A water-elevator of the class described having a water-cylinder provided with circumferential bands, and longitudinally-extensible braces secured to the said bands and projecting radially with reference to the cylinder.

2. A water-elevator of the class described having a water-cylinder, a weight-plunger therein, an operating-rod for the weight-plunger, means, coacting with the said rod, to raise and release the weight-plunger, a supplemental weight, guided by the said rod, and means to support the supplemental weight in an elevated position independently of and during the normal operation of the weight-plunger, and to release said supplemental weight and cause it to drop on the weight-plunger to increase the force of the downstroke of the latter.

3. A water-elevator of the class described, having a water-cylinder, a weight-plunger therein, means to raise and release the weight-plunger, a supplemental weight, raised by the weight-plunger, automatically-operating means to support the supplemental weight when raised, independently of the weight-plunger, and means, independent of the weight-plunger-releasing means, to drop the supplemental weight to add its force to that of the weight-plunger during the effective downstroke of the latter, substantially as described.

4. A water-elevator of the class described, having a water-cylinder, a weight-plunger therein, means to raise and release the weight-plunger, a supplemental weight raised by the weight-plunger, automatically-operating hangers, actuated by the supplemental weight when the latter is raised, to support the supplemental weight in a raised position, and manually-operated means to cause said hangers to release said supplemental weight, for the purpose set forth.

5. A water-elevator of the class described having a water-cylinder, a weight-plunger therein, means to raise and release the weight-plunger, a supplemental weight, and means to support the supplemental weight in an elevated position, independently of and during the normal operation of the weight-plunger, and to release said supplemental weight and cause its weight to be added to that of the weight-plunger to increase the force of the downstroke of the latter.

In testimony whereof we affix our signatures in presence of two witnesses.

MATHEW V. RUFF.
ROBERT C. IRWIN.

Witnesses:
F. A. WINTER,
E. W. HANEY.