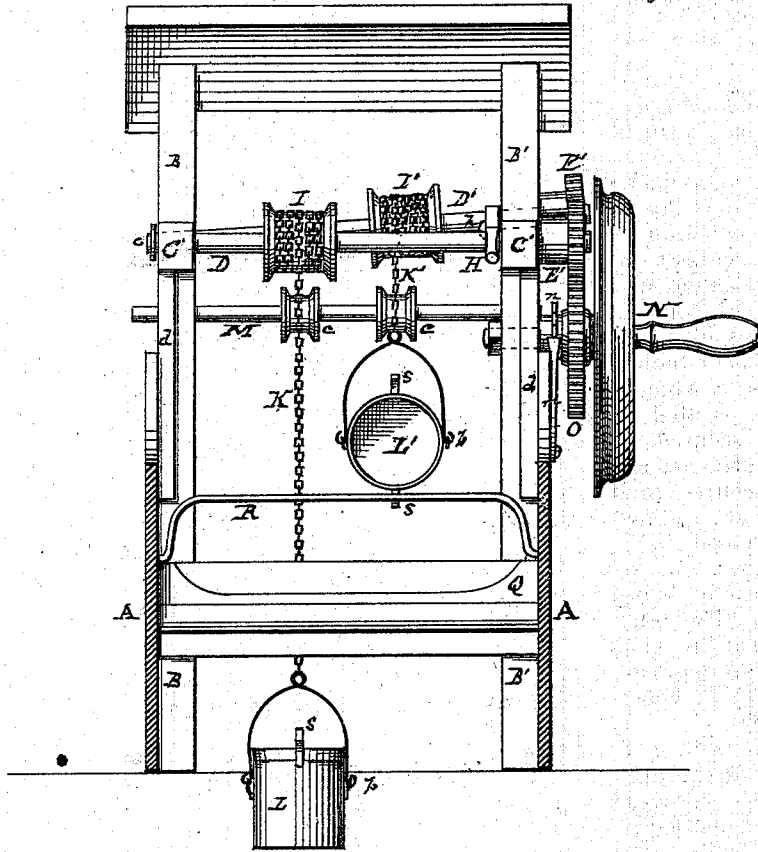


**D. J. McMILLEN.**  
**Water-Elevators.**

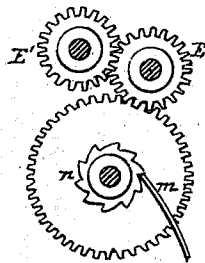
No. 146,086.

Patented Dec. 30, 1873.

*Fig.1.*



*Fig. 2.*



Attest:  
 E. W. Howard  
 A. Gibson

Inventor,  
Drury J. McMillen  
By his attys.,  
Cox and Cox

# UNITED STATES PATENT OFFICE.

DRURY J. McMILLEN, OF CHILLICOTHE, MISSOURI.

## IMPROVEMENT IN WATER-ELEVATORS.

Specification forming part of Letters Patent No. **146,086**, dated December 30, 1873; application filed October 4, 1873.

### *To all whom it may concern:*

Be it known that I, DRURY J. McMILLEN, of Chillicothe, Livingston county, Missouri, have made and invented a new and useful Improvement in Water-Elevators, of which the following is a specification:

The invention relates to that class of water-elevators that are chiefly used for drawing water from wells. It consists in providing a frame, to the sides of which are fastened uprights, provided near their upper extremities with cross-pieces, in which are the bearings of two horizontal parallel metallic bars, upon each of which is secured a cylinder or capstan, to which is attached a rope, the lower extremity having secured to it a bucket. Pivoted to the upright, adjacent to the crank hereinafter mentioned, is a lever, through which pass the two horizontal bars, one on either side of the pivot, being arranged so that they turn freely. The bearings of the horizontal bars toward the windlass are open, so that by elevating or depressing the power end of the lever one of the bars will be raised and the other lowered.

The crank is of usual construction, its axle being secured to the upright near it. It has attached to its axle a gear-wheel, which is arranged with relation to two smaller gear-wheels, that are rigidly secured to the ends of the metallic rods, the three wheels being so placed that the direction of the revolution of the cylinders or capstans upon the bars may be reversed by means of the lever, as will fully appear hereinafter. Thus the crank may be turned continuously in one direction, and, by operating the lever, the buckets alternately raised and lowered. Directly below the rod nearest the front of the frame, or below the center of the space between the two upper rods, is a third metallic rod, which is rigidly secured at either side of the frame to uprights that are fastened to the frame below, and assist in sustaining the cross-pieces above mentioned. Upon the rod last aforesaid turn two friction-rollers, which are in proximity to the capstans, and serve to direct the ropes and buckets thereto attached. The bucket is constructed with bent arms that, projecting upward, occupy places upon its rim in the plane that is at right angles to that which passes

through the ears that are provided for the handle, which are attached to the outer circumference of the bucket near its middle. Within the frame, attached to the front end thereof, is a trough provided with a spout that leads in any convenient direction, and resting upon its inner edge, so as to catch the adjacent arm of the bucket when being elevated, is a rod that, extending the length of the trough, turns freely in apertures cut in the sides of the frame, its ends being bent and conformed accordingly. As the bucket is elevated the arm catches the rod last described, which is raised with the bucket, the latter tipping, gradually and gently, and discharging its contents into the trough, which having been effected the direction of the revolution of the capstan is reversed by means of the lever, whereupon, the bucket descending, the arm is disengaged, when the rod falls into position to receive the other bucket.

The object of the invention is to provide a convenient and effective and rapid means of elevating water, especially adapted to wells or cisterns.

Figure 1 is a front view of a device embodying my invention, partly in section. Fig. 2 is a side view, showing the relations of the gear-wheels.

A is the frame, which is preferably of rectangular shape, to the sides of which are securely attached the uprights B B', near the upper ends of which are the cross-pieces C C', which are rigidly fastened to the uprights. D D' are the two horizontal metallic rods, the ends of which rest, respectively, in boxes or covered bearings in the piece C and in open bearings in the piece C', being provided with the buttons c to prevent their dislocation. The bars D D' are permitted to project beyond the piece C', and gear-wheels E E' are rigidly attached upon the projections, in such position that they engage each other, and that either may be raised clear of the gear-wheel O, which engages both of the wheels E E' when in their lower position. H is a horizontal lever, that is attached to the upright B' by the pivot h, and through apertures in which pass the rods or bars D D', the apertures and other parts being of such size and so constructed as to permit the bars to turn freely. The power

end of the lever H is carried out so as to be easily controlled by the operator at the crank. Upon the rods D D' are fastened the flanged cylinders or capstans I I', to which are secured the ropes K K', at the ends of which are the buckets L L'. Below the rod D, supported by the uprights d, which are attached to the frame and rest against the uprights B B' and assist in supporting the cross-pieces C C', is the rod M, which is parallel to the rod D, upon which rotate and slide the friction-rollers e, over which pass the ropes K K'; the rollers being placed opposite and below the capstans I I'. N is the crank, which, in the present instance, consists of a wheel provided with a handle, the axle of which turns in a bearing in the upright D' and that part of the frame adjacent thereto. Sufficient space being left for it, the gear-wheel O is rigidly attached to the axle of the crank immediately below the wheels E E'.

The diameter of the wheel O is greater than that of the wheels E E', to effect a rapid revolution of the capstans I I'. Between the wheel O and the frame is the ratchet-wheel n and pawl m, which are attached, respectively, to the axle of the crank and frame. L L' are the buckets, which have the ears p, to which the handles are attached, fastened below the middle of a vertical plane drawn from the rim to the bottom; and upon the rim in the plane—that is, at right angles to that which passes through the ears p—are the bent or hooked arms s, that project above the rim, being firmly secured thereto. Attached to the inside of the front side of the frame is the trough Q, provided with a spout which directs the water as may be desired. Upon the front edge of the trough rests the rod R, the ends of which are bent, and turn freely in apertures in the sides of the frame. It is so placed that, when undisturbed, it extends beyond the edge of the trough its entire length, resting thereon, and so that the arms s will catch it when the buckets are raised, and so that, upon the arms being disengaged, it will fall into its natural position upon the trough.

The bucket L being in the well, the crank N is turned, thus elevating the bucket L and lowering the bucket L'. As the bucket L is drawn up, the arm s engages the rod R, and

the two rising together, the bucket is gradually tipped toward the trough Q until its contents are delivered therein, when the arm s disengages itself, the rod R falls forward into its place, and the bucket rights itself. In the mean time the bucket L' has been lowered, and its elevation must be effected by the wheel E', the bucket L being controlled by the wheel E. Power is now applied to the lever, which disengages the wheel O and throws the wheel E' in gear with the latter. Motion is thus no longer communicated directly to the wheel E by the wheel O, but indirectly by the wheel E', so that the direction of the revolution of the wheels E E' is reversed in both cases. Thus, without changing the turning of the crank, lowering the ascending and raising the descending bucket, the adjacent arm of the latter of which catches the rod R and causes a delivery, as above described, when the lever is again applied with like effect.

In the construction of the buckets, the bottoms or lower parts should be made of such weight that they will right themselves, after being tipped, of their own weight. The rod R should, also, be so constructed that it will fall across the edge of the trough, of its own weight.

If it be desired, a single capstan and rope may be employed, by coiling the rope around the capstan in different directions, a bucket being attached at each end; but the device described is to be preferred.

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

The gear-wheels E E', arranged to engage each other in the manner specified, and secured to the rods D D', operating vertically by the action of the lever H, and provided with the flanged capstans I I', in combination with the sliding friction-rollers e, substantially as shown and described.

In testimony that I claim the foregoing improvement in water-elevators, as above described, I have hereunto set my hand and seal this 29th day of September, 1873.

DRURY J. McMILLEN. [L. S.]

Witnesses:

W. J. BIRD,

GEO. W. WARDER.