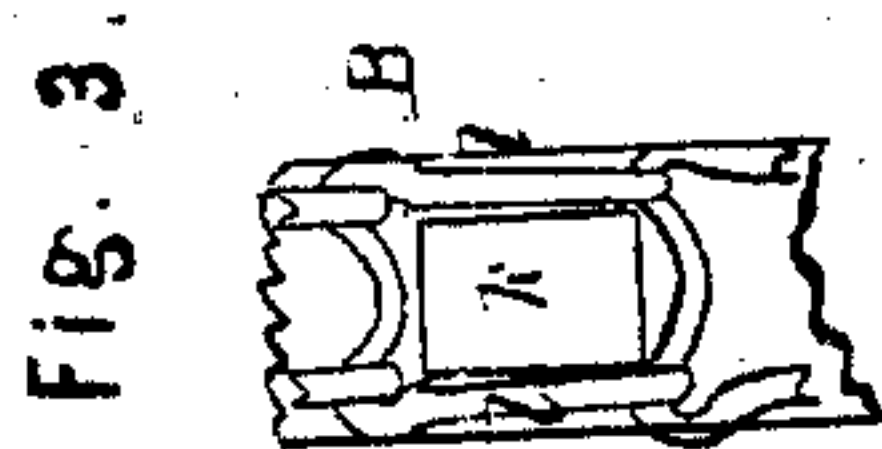
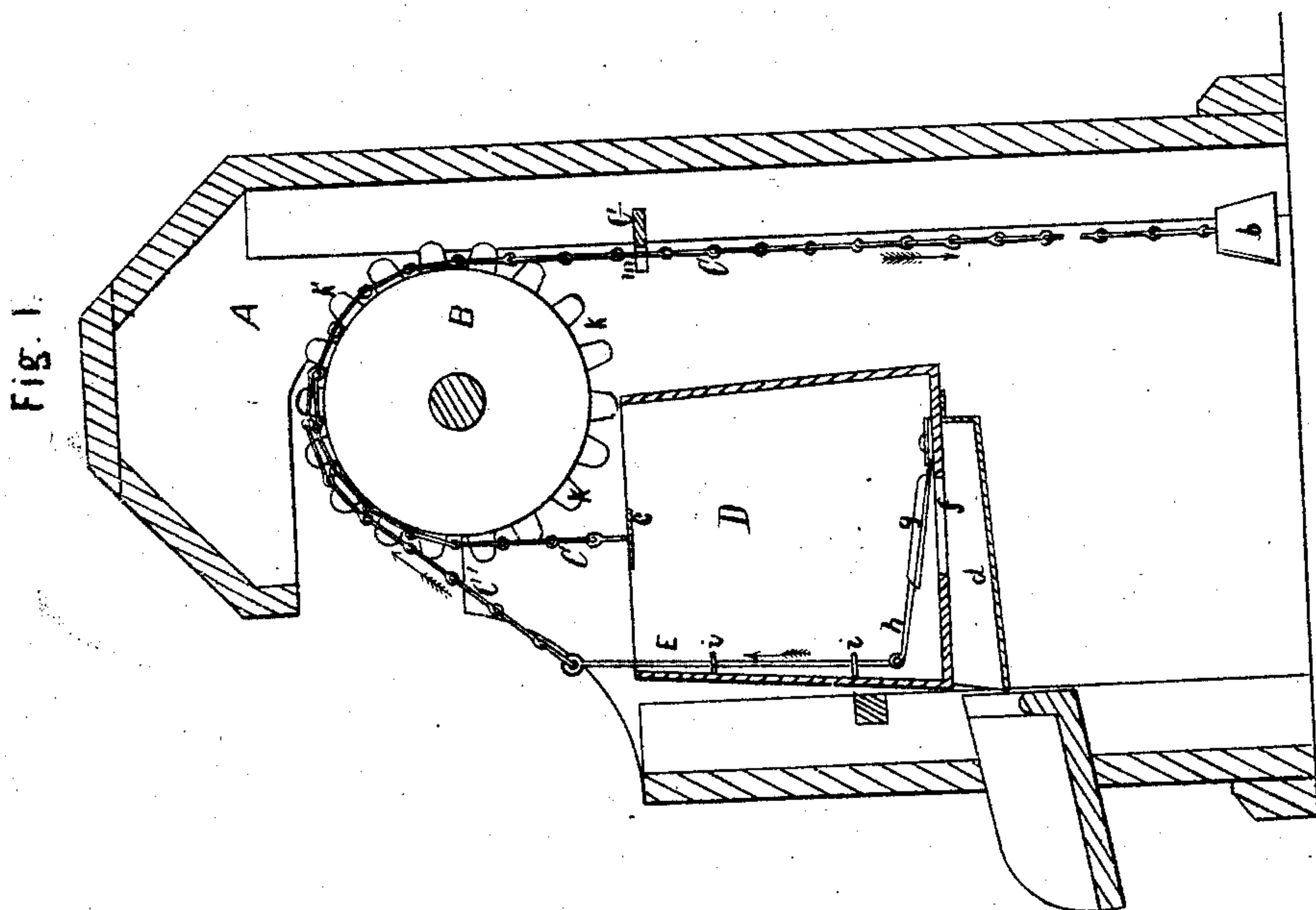
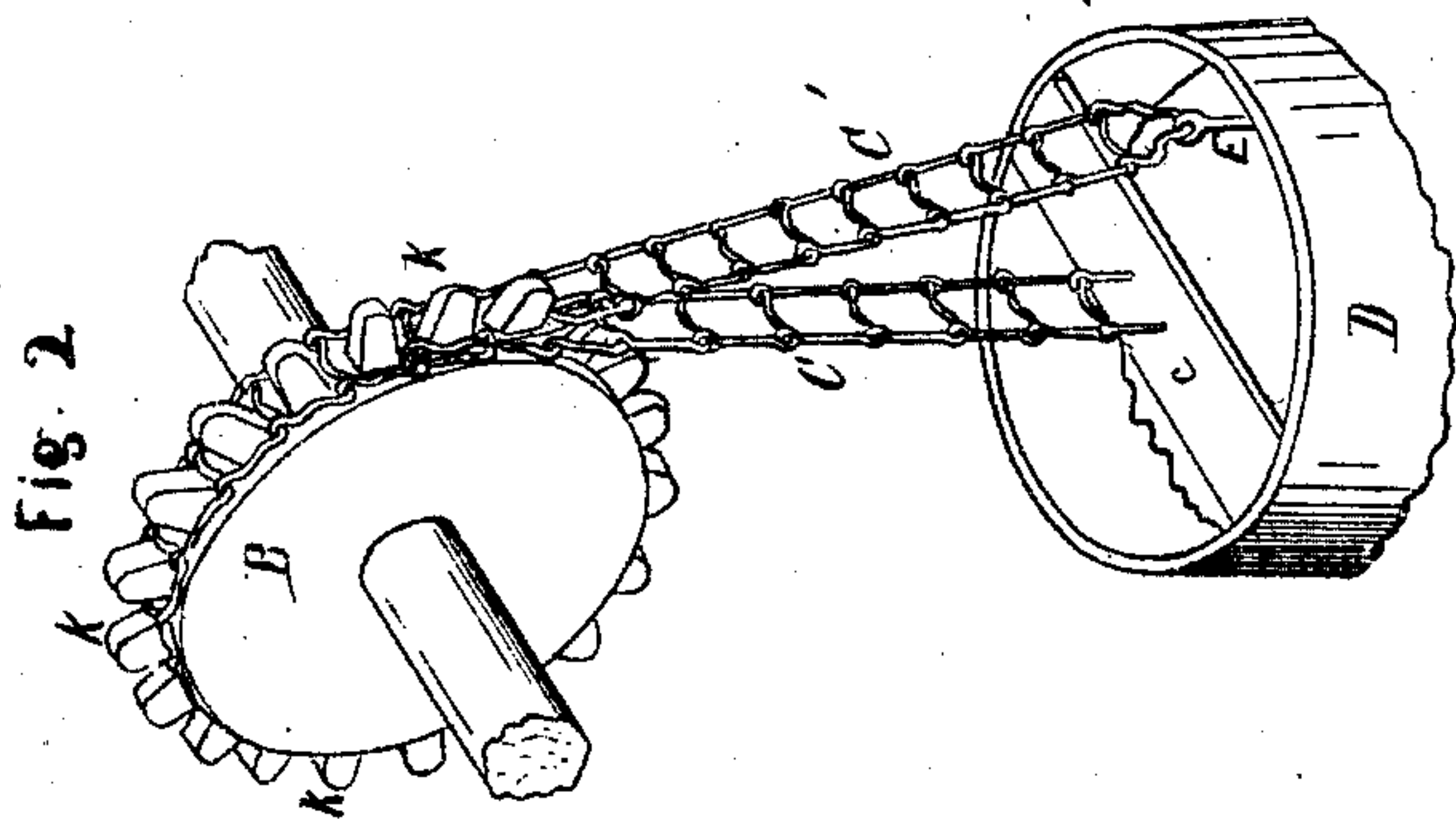


B. B. Bignall.
Water Elevator.

No 41,672.

Patented Feb. 23. 1864.



Witnesses

Horace
C. W. Cheney

Inventor:

B. B. Bignall,
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Attys

UNITED STATES PATENT OFFICE.

B. B. BIGNALL, OF OWEGO, NEW YORK.

IMPROVEMENT IN WATER-ELEVATORS.

Specification forming part of Letters Patent No. 41,672, dated February 23, 1864.

To all whom it may concern:

Be it known that I, B. B. BIGNALL, of Owego, in the county of Tioga and State of New York, have invented certain new and useful Improvements in Apparatus for Drawing Water from Wells; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a central vertical section of my improved machine, with the bucket raised and valve opened; Fig. 2, a perspective view of the reel, the double end of the elevating chain, and the top of the bucket; Fig. 3, a diagram exhibiting a portion of the reel and one of the elevating-spurs, and showing also the relative position of the elevating-chain in red lines.

Like letters of reference indicate corresponding parts in all the figures.

My improved machine is of that class in which the bottom of the bucket is provided with a valve and with a spout, which, when the bucket is brought to the proper position, discharges the water into the spout of the curb.

A suitable curb, A, is provided, in which is mounted a shaft having a reel or elevating-wheel, B, and provided also with a ratchet-wheel, into which catches a pawl in the usual manner. Over the reel passes a chain, C, to the forward end of which is attached a bucket, D, and to the opposite end of which is secured a counterbalance-weight, *b*. The chain is attached to the bucket by means of a cross-bar, C, or in any equivalent manner. The chain is composed of the usual links.

The spout *d*, port *j*, and valve *g* of the bucket do not differ essentially from the corresponding parts in general use.

To the forward end of the valve is fastened a projection, *h*, or equivalent, and with this is secured a stem or rod, E, passing upward through guides *i i*, and having connected with it, at the top, an auxiliary chain, C', of short length, and which is secured at its opposite end to the main chain C.

The reel B is of peculiar construction. In the ordinary reel the spurs which catch the link are made of wedging form transversely; or, in other words, the base of the spurs is of the same lateral thickness as the rim of the elevating-wheel, while the elevation or point

is narrower. The consequence is that if the bucket has a turning motion on its axis from any cause in ascending the links do not rest steadily on the spurs, but turn and work laterally in one direction or the other, especially if their width is greater than that of the spurs, so that the bucket will not come to the proper position when raised, frequently discharging its water to one side of the spout.

I form the spurs *k k* of my reel of nearly the same thickness their whole height, or make them but very slightly wedging, and also make the rim of the wheel of greater thickness transversely, so as to leave on each side of the spurs a plane space or bearing, *l*, Figs. 2 and 3, of sufficient width to receive and support the links. The links are made to fit closely the spurs. By this arrangement the links of the chain, resting firmly on the plane-bearing *l*, and at the same time closely embracing the spurs, are held in place against any lateral twisting or slipping movement, and, consequently, the bucket is prevented from being greatly displaced, for if the chain has a tendency to turn on one of its sides as a fulcrum, as is frequent in the ordinary device, the action is prevented by the vertical projection of the spurs. If they are wedging, the links will turn entirely over them at any sudden turn of the bucket. By resting on the bearings *ll* there is no tendency of the links to slip sidewise either one way or the other, as in the usual arrangement.

The bucket is raised by the single main chain C till it has nearly arrived at the proper position to discharge the water, when the links of the auxiliary chain C' also catch on the spurs and wind up. Of course, this action straightens the auxiliary chain, and consequently raises the stem or rod E and opens the valve, allowing the water to discharge. When lowered, the auxiliary chain C' is slackened sufficiently to allow the valve to close over the port.

There are several useful effects resulting from this arrangement of the chain:

First. In winding up there is considerable strain or pressure comes on the auxiliary chain, and as the auxiliary chain rests on top the main chain when winding on the wheel, this pressure has a tendency to keep the latter in place, so that the bucket cannot turn.

Second. The chains, by having two sepa-

rated bearings or holds on the bucket, and both being taut, hold the same rigidly in place without the possibility of turning. This is very effective and convenient.

Third. The valve is operated automatically, opening when raised to the proper height and closing when lowered.

Fourth. The auxiliary chain, when straightened by winding on the reel, throws the bucket forward over the spout of the curb.

The combined action of the reel and the chains, constructed and arranged as above described, is such as to be most effective in bringing the bucket up in the proper position and sustaining it against any turning or swinging movement. The use of a reel and chain is found to be more convenient and effective than a metallic band winding on a drum, or any arrangement of cords, which generally have to be double to keep the bucket from turning. By this arrangement I am enabled to employ the reel and chain, while the only extra cost is in the few extra links forming the auxiliary chain, and which is but nominal.

At a suitable position below the reel, in the rear, is situated a cross-board, G, or its equivalent, having a passage, opening, or hole, *m*, therein, through which passes the main chain C in ascending or descending, as represented in Fig. 1. The passage *m* is of such shape and size as to allow the chain to pass through it freely, but not such as to allow the weight *b* to pass in ascending. Consequently, when the bucket is lowered and the weight raised the

latter will strike the board and stop at that position. This is of consequence, for it prevents the chain and weight from being drawn over the reel and lost in the well, as is frequently the case in the ordinary arrangement of water-drawers. It also has the effect of steadying the chain against any swinging or swaying motion that it may receive, and thus prevents the chain from becoming removed easily from the reel. An iron casting of the proper form would answer in place of this board.

I am aware that a metallic band winding on a drum has before been employed, having a secondary band for operating the valve, but such I do not claim.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The reel B, having the spurs *k k*, of nearly the same transverse thickness at the base and top, and the bearings *l l*, respectively, on each side of the spurs, for the support of the chain, substantially as herein set forth.

2. The toothed reel B, constructed as described, with the main chain C, auxiliary chain C', and bucket D, all arranged and operating substantially as and for the purposes herein specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

B. B. BIGNALL.

Witnesses:

F. O. CABLE,
HARRISON COREY.