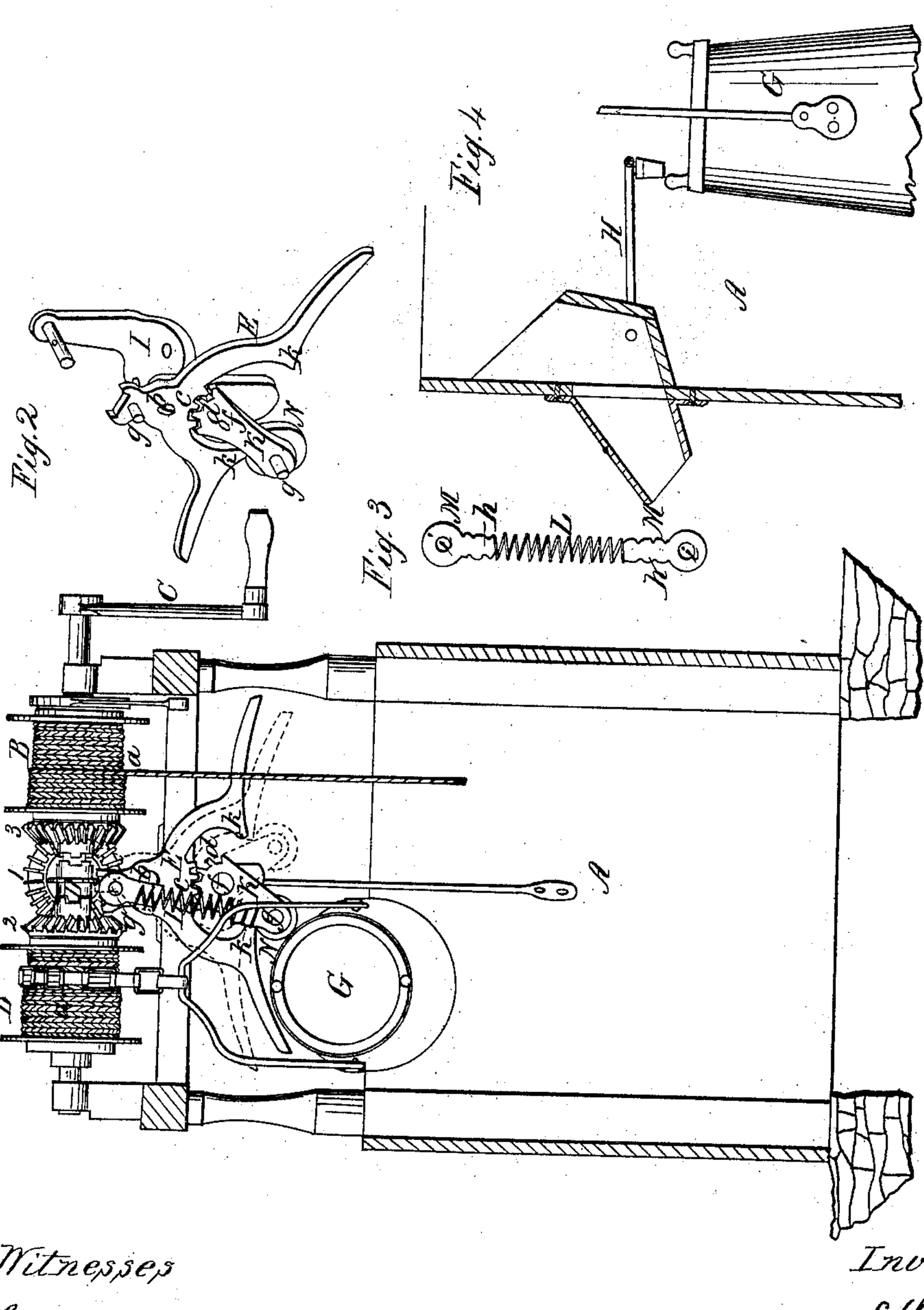
E. L. & W. R. Yorks,

Windlass Water Elevator.

No. 63,602. Patented Apr. 2, 1867.



Witnesses

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ELIAS L. AND W. R. YORKS, OF HONEOYE FALLS, NEW YORK.

Letters Patent No. 63,602, *dated April* 2, 1867.

IMPROVEMENT IN WATER ELEVATORS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, E. L. and W. R. YORKS, of Honeoye Falls, in the county of Monroe, and State of New York, have invented certain new and useful Improvements in Water Elevators; and we 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 sectional elevation of our improved elevator.

Figure 2, a perspective view of the shifting levers and their frame, detached.

Figure 3, an elevation of the spring and its tension-screws, detached.

Figure 4, a diagram showing an elevation of the apparatus for tilting the buckets.

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

Our improvement belongs to that class where the buckets are alternately raised and discharge their water by turning the crank constantly in one direction, the action being accomplished through the medium of a shifting spring lever.

The invention consists in the arrangement of the shifting lever and its connecting parts, as hereinafter set forth.

As represented in the drawings, A is the curb, on which are mounted the double spools or windlasses B B, connected by bevel gears 1 2 3, and operated by a winch, C. On the windlass-shaft, between the spools, rests a sliding-clutch, D, shifted alternately from one spool to the other by a spring tilting lever, E, against whose extremities the buckets G strike as they are alternately raised. The cords or chains *a a* of the buckets wind upon the spools, and the buckets themselves are tilted or tipped to discharge the water by catching the bail H, and after being emptied they strike the lever E to shift the clutch. Thus far the construction and arrangements are essentially the same as in all machines of this class.

We will now explain the improvements we have added to the apparatus: The lever E is pivoted at *b* to a frame or bearing, I. On the under side of the lever is a set of cogs, *c*, and with these engage cogs *d* of a lever, K, which is pivoted at *f*. The levers above and below the pivots have pins *g g*, with which connect a tension-spring, L, as clearly shown.

By this arrangement of the levers E K, connected by gearing, it will be seen that they mutually act upon each other in shifting their position, that is to say, at the moment of passing the dead-point in either direction the pins *g g*, to which the ends of the tension-spring are connected, are thrown beyond the line of the pivots, and therefore the said spring will draw equally upon both levers; and since the latter are geared, as before mentioned, each must act upon the other, thus constituting them double-acting levers in the real sense of the term. The advantages of this will be readily appreciated when it is considered that in ordinary elevators of this class the lever E is single acting, and when it has been moved to the dead point the spring can act in only one direction to throw it beyond, so that but one-half the action is attained as in our device. In the old arrangement, also, the lever E must really be raised by the bucket to a greater degree beyond the dead-point before the spring will act sufficiently to throw it over. It will be perceived that the spring L acts simply by tension, and operates directly upon the levers without intermediate parts. In this form it is less liable to break by cold or to become frozen in. It is the most effective that can be applied in connection with the double-acting levers. It will be seen that there is no loss whatever from friction, since the only action of the spring is to expand and contract as the levers shift their position. There is no friction or contact whatever with other parts. This is far more effective than where the spring acts by compression to throw up a bolt, which produces friction in its bearings, and which is therefore deficient in throwing the lever. In order to compensate for the stretch and loss of elasticity of the spring, we prefer to employ at the ends blanks M M, cut from a metallic sheet, having teeth *h h* corresponding with the coils of the spring, and an eye, *i*, for hooking over the pins *g* of the levers. By screwing them at any time deeper into the coils of the spring any stretch of the spring will be compensated for. We prefer to secure on a bearing of the end of the lever K a friction-wheel, N, whose relative position with the extremities of the lever E is such that when the buckets come up they will strike both the extremities of the lever and the wheel. In this manner the buckets act positively upon both levers E K, and therefore the levers will be thrown with but one-half the action necessary where only a single lever is employed. We would remark, however, that the levers can be actuated, as before described, without the

use of the wheel N. The lever E is provided on opposite sides of the centre with stops *k k*, projecting inward, as shown, and so relatively arranged with the lever K and clutch D, that when thrown in either direction the corresponding stop *k* will strike the side of the lever K and thus gauge the stroke. The action is thus measured or limited, and the parts all form a connection or stiffness throughout without undue bearing, pressure, or friction. There is therefore no unnecessary strain.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, in water elevators, of the double-acting levers E K, geared together, and connected by any suitable spring arrangement, as herein set forth.

2. The combination of the tension-spring L, with the double-acting levers E K, so arranged that the action of the spring is simply to expand and contract to operate the levers, and to avoid friction, as specified.

3. The screw-blanks M, in combination with the spiral tension-spring L, for compensating for the loss of elasticity, as set forth.

4. The friction-wheel N, combined with the levers K E, operating in the manner and for the purpose specified.

5. The stops *k k*, combined with the levers E K, and the clutch D, as set forth.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

ELIAS L. YORKS,
W. R. YORKS.

Witnesses:

DANIEL G. SMITH,
WM. BURBERRY.