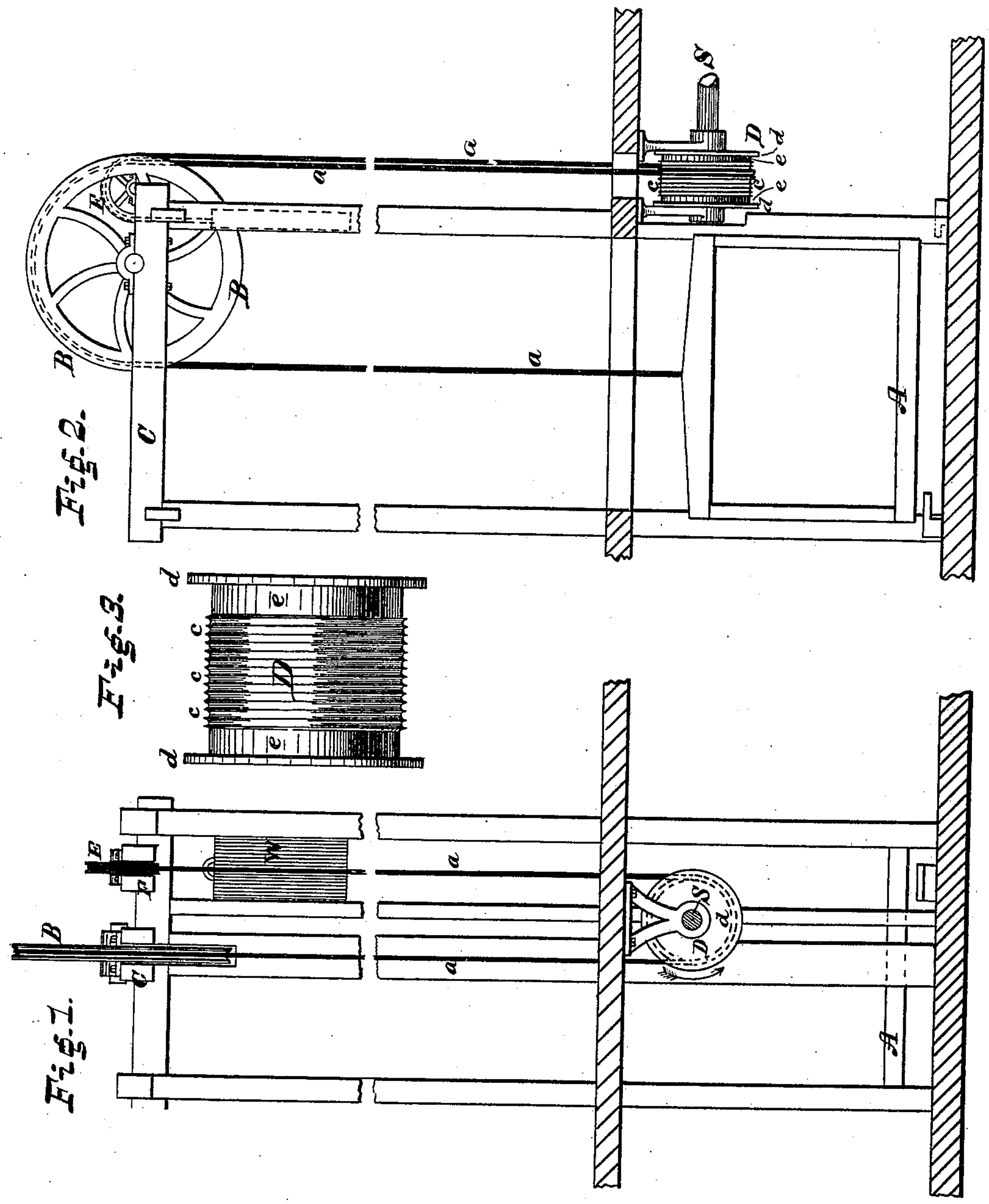
J. M. JOHNSTON & R. MARSHALL.
Elevator.

No. 202,264. **Patented April 9, 1878.**



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UNITED STATES PATENT OFFICE.

JAMES M. JOHNSTON AND ROBERT MARSHALL, OF PITTSBURG, PA.

IMPROVEMENT IN ELEVATORS.

Specification forming part of Letters Patent No. **202,264**, dated April 9, 1878; application filed March 25, 1878.

To all whom it may concern:

Be it known that we, JAMES M. JOHNSTON and ROBERT MARSHALL, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Elevators; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in that class of elevators in which the platform and a counter-weight occupy the two ends of the rope and the operating mechanism is interposed at an intermediate portion of the rope, and consists in the construction and arrangement of parts, substantially as hereinafter fully described and claimed.

Figure 1 is a front, and Fig. 2 a side, elevation, showing merely the timbers and hoisting devices as operated from the drive-shaft. Fig. 3 is a detail of the grooved spool.

The platform A may be of any style or arrangement known to makers of this class of machinery. It is attached to one end of the hoisting-rope *a*, which, passing up the hatchway over grooved sheave B journaled in the shears C, returns thence downwardly to a peculiarly-constructed spool or drum, D. Passing one and a half time or more around spool D, the rope *a* rises again to a sheave, E, preferably located at the top, and journaled in the timbers, or in shears F. Passing over this, the rope is attached to a counter-weight, W, more or less in equilibrium with platform A, and arranged to slide freely in the elevator-timbers, or any convenient place. The rope *a*, platform, and weight, we so arrange relatively, by means of the timbers or special stop-blocks, that in the descent of the platform it strikes bottom or stops at its lowest limit just before the weight can strike the upper timbers, and in the ascent of the platform the weight shall strike bottom or stop at its lowest limit just before the platform-timbers can strike the sheave B or shears C.

This arrangement, in connection with our spool, prevents injury by causing the rope to slacken slightly to allow the spool to perform its special duty. This spool D consists of a cylindrical drum, having end flanges *d*, smooth cylindrical portions *e* inside the flanges, and a half-round spiral groove, *c*, in the middle, arranged as a screw-thread, the bottom of groove *c* being of the same radius as portions *e*, at each end vanishing into said surfaces *e*. The functions peculiar to this spool will be best understood from the operation of the devices.

Motion of the drive-shaft S causes spool D to revolve, as shown by arrow in Fig. 1, and the rope *a*, having a turn and a half thereon, must partake of such motion if unchecked by some obstacle. Consequently platform A rises and weight W descends. If, now, any obstacle lie in the path of weight W, or should it become fastened in any way, it stops, and the rope slackens slightly. Spool D, however, continues to revolve, but the slack rope slides in the groove *c* and travels to the left, Fig. 2, till it reaches plain surface *e*, where, checked by flange *d*, it remains, while spool D revolves without any further movement of either the platform or weight until the obstacle is removed. The reverse happens when the platform in descending meets an obstacle, the spool continuing to revolve, the rope now traveling to the right to the other plain end, *e*, where it remains, as before. In both cases the rope reaches a surface on which the friction is comparatively trifling, and where no cutting of the rope can occur. And while effecting such desirable object, no injury can arise to the platform or weight from failure to instantly stop the machinery, for the spool will revolve freely, while both platform and weight are securely maintained at the point of stoppage until a remedy is applied. A reversal of drive-shaft at once moves rope *a* in the contrary direction, and causes it to travel back into groove *c*.

Of course spool D may, if desired, be made single-acting, with but one plain end and flange. In some circumstances the double construction will be unnecessary.

It may be located at any floor, and may have its groove threaded either right or left handed, according as circumstances may demand.

For want of room, sheave B may be replaced

by two small sheaves in line, so as to lead the rope outside the hatchway.

We claim as our invention—

1. In an elevator, a cylindrical spool interposed between the ends of the rope, and having a spiral half-round groove on a portion of its surface, vanishing into a plain cylindrical surface, even with the bottom of the spiral groove, and a flange at the end, substantially as described, whereby stoppage of the rope permits free revolution of the spool, and causes the rope to travel onto the plain surface, to reduce friction and prevent cutting of the rope.

2. The combination of platform A, rope *a*, and weight W with a spool, D, having a flange, *d*, smooth portion *e*, and spiral groove *c*, rope *a* being wound one and a half or more times around the spool, substantially as and for the purposes described.

3. The combination of platform A, rope *a*, and weight W with a spool, D, having the end flanges *d*, plain surfaces *e* at each end, and spiral groove *c* at the middle, rope *a* being wound one and a half or more turns on the spool, substantially as described.

4. In combination with platform A, rope *a*, weight W, and spool D, a stop placed at the downward limit of movement of the platform, the relations being such that the platform ceases to move before the weight reaches its upper limit, as described.

5. In combination with platform A, rope *a*, weight W, and spool D, a stop placed at the downward limit of movement of the weight, the relations being such that the weight ceases to move before the platform reaches its upper limit, substantially as shown.

In testimony that we claim the foregoing as our own we affix our signatures in presence of two witnesses.

JAMES M. JOHNSTON.
ROBERT MARSHALL.

Witnesses:
THOS. J. MCTIGHE,
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