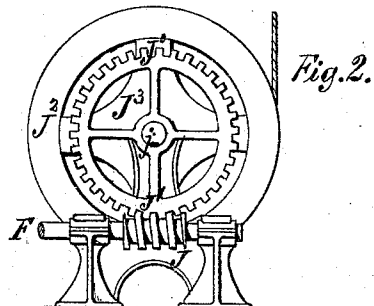
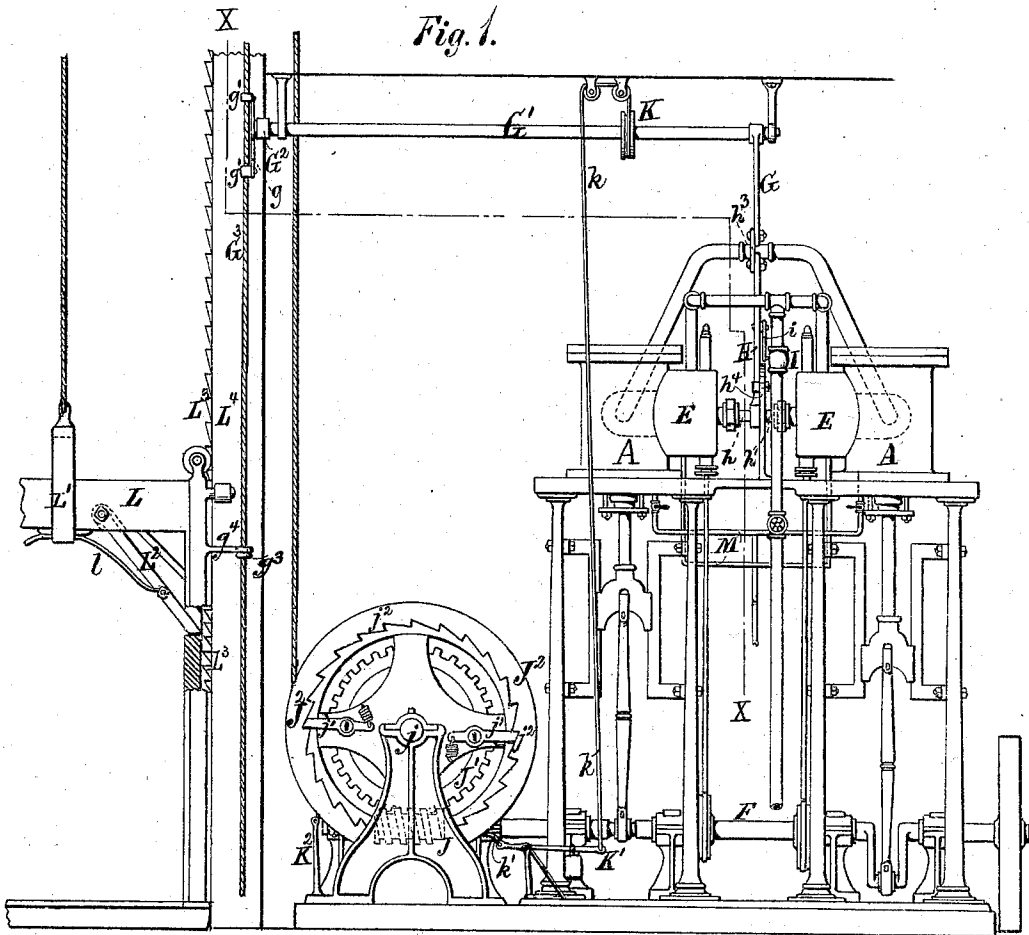


P. W. MELLEN.
Elevators.

No. 137,464.

Patented April 1, 1873.



WITNESSES:

Geo. L. Swin
Walter Allen

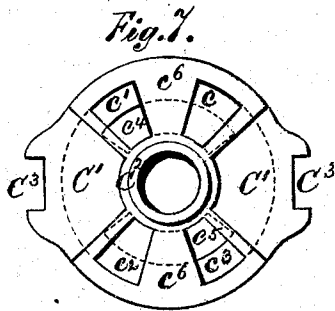
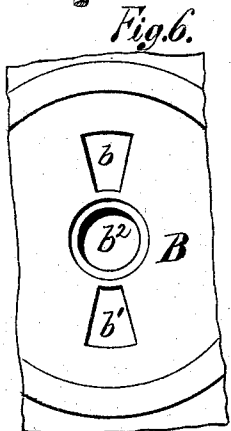
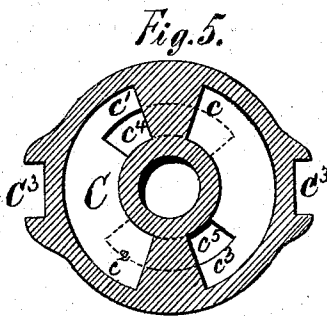
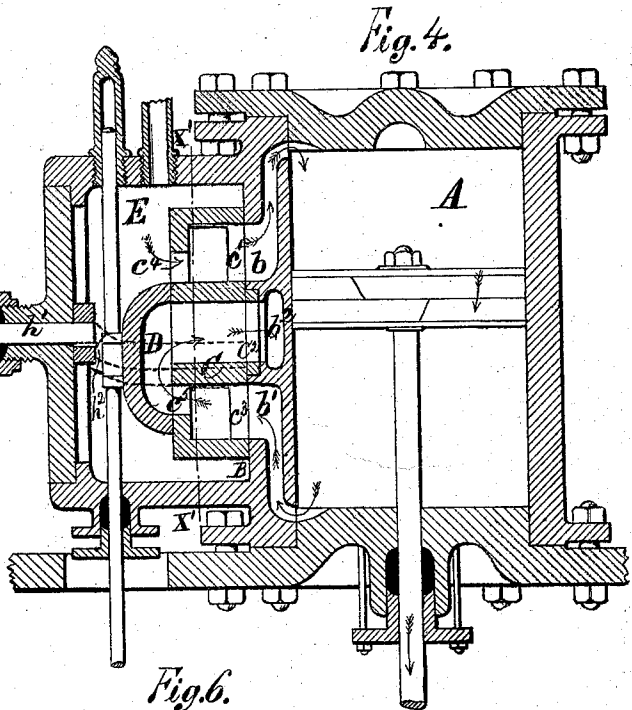
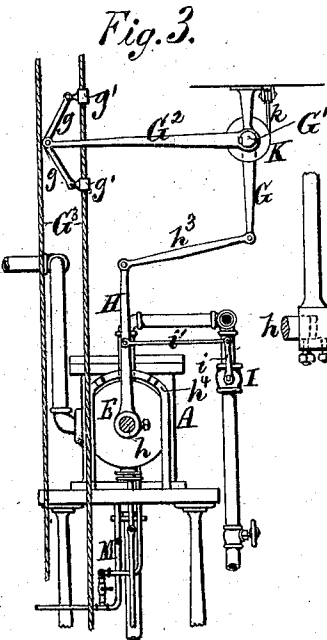
INVENTOR:

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UNITED STATES PATENT OFFICE.

PETER W. MELLEN, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN ELEVATORS.

Specification forming part of Letters Patent No. **137,464**, dated April 1, 1873; application filed November 21, 1872.

To all whom it may concern:

Be it known that I, PETER W. MELLEN, of the city and county of St. Louis and State of Missouri, have invented certain Improvements in Elevators, of which the following is a specification:

My invention consists, first, in the arrangement, in connection with the check-rope of the elevator, of a rock-shaft, to which is keyed an arm, the end of which is connected to links whose ends are jointed to brackets attached to the check-rope, so that the rope does not partake of the side movement of the end of the arm to which it is connected, said rock-shaft being provided with an arm connecting by a cross-bar with the reversing-lever keyed on the stem of the forked arm that operates the reversing-valves, so that when the operator pulls the check-rope the engines can be stopped or reversed, as desired, or, when at rest, started; second, in the arrangement on the hoisting-drum shaft of a worm-wheel which is driven by a worm-screw on the crank-shaft of the engines, the object of which is to obviate, in lowering heavy loads, the excessive speed and heavy strain that are thrown on the engine where cog-gearing or belts are used to drive the hoisting-drum, as the screw takes up all the thrust of the drum and acts as a brake to prevent excessive speed; third, in the arrangement of the hoisting-drum loosely on its shaft and providing it with circularly-arranged ratchet-teeth, in which engage spring pawls or dogs pivoted to a hub which is keyed on the drum-shaft; the purpose of this arrangement is to prevent unwinding of the hoisting-rope from the drum, when the elevator is stopped in its descent by any accidental cause, the shaft on which the drum is mounted being allowed to freely rotate while the drum is held stationary by the brake, which is always applied when the platform is not being raised; fourth, in the arrangement on the rock-shaft above described of a grooved pulley to which is attached a cord connected to a weighted brake-lever, so that when operating the check-ropes to cause the elevator to ascend the grooved pulley will take up a portion of the cord and lift the brake-lever and prevent the brake from acting on the drum, and when the check-rope is operated for descent of the ele-

vator the brake will be thrown automatically into action by releasing its weighted lever; fifth, to the safety mechanism on the platform. This consists of a pair of dogs whose upper ends are pivoted in the top cross-bar of the hoister, and which are connected together by a horizontally-extending spring which passes through the strap of the hoisting-rope, which strap passes around the said cross-bar in such a manner as to have free vertical play or movement thereon, when the platform is not sustained by the rope; when the latter is the case the center of the spring connecting the dogs is raised, and the lower ends of the dogs are thus drawn back from the vertical safety-racks extending up the insides of the vertical guide-posts of the platform.

Figure 1 is a front elevation. Fig. 2 is a detail rear elevation of drum, driving-screw, &c. Fig. 3 is a transverse section at line X X. Fig. 4 is a detail axial section of steam-cylinder and valves. Fig. 5 is a face-section of reversing-valve at line X' X'. Fig. 6 is an elevation of cylinder-ports. Fig. 7 is a face view of reversing-valve.

A are the cylinders of two engines set at half-stroke in relation to each other so as to carry over "dead-centers."

There is nothing novel claimed in the pistons or pitmen nor cranks.

The cylinder valve-seat B of each cylinder has two steam-ports, $b\ b^1$, and an exhaust-port, b^2 . On this seat works an oscillating valve, C, having on the side toward the cylinder four ports, $c\ c^1\ c^2\ c^3$, and on the other side two segmental ports, $c^4\ c^5$, c^4 being in communication with $c^1\ c^2$, and c^5 with c^3 . The outer face of the valve C forms the seat of the circular concavo-convex slide-valve D, which operates to put the ports $c^4\ c^5$ alternately in communication with the interior of the steam-chest E and with the exhaust-port b^2 . The valve D is operated by usual valve-stems and eccentrics on the main or crank shaft F. By means of the oscillating valve C and its ports $c\ c^1\ c^2\ c^3\ c^4\ c^5$ the engine can be either reversed or stopped, the stoppage of the engine being effected by bringing the flat portions c^6 of the valve C over the ports $b\ b^1$ of the cylinder, and thereby shutting off steam from the same. To reverse the engine, (when the cylinders of the

same are alternately receiving and exhausting steam through the ports $c^4 c^1 b$ and $c^5 c^3 b^1$,) the valve C is oscillated so as to bring the ports $c c^2$ in communication with the cylinder-ports $b b^1$, respectively. The steam will then alternately enter an exhaust from the steam-cylinder through ports $c^5 c b$ and $c^4 c^2 b^1$, and if before the reversing the piston of the cylinder is on its down-stroke, and the cylinder receiving steam through ports $c^4 c^1 b$, and exhausting through ports $b^1 c^3 c^5$, as indicated in Fig. 4, then, by oscillating the valve C so as to bring ports $c c^2$ into communication with cylinder-ports $b b^1$, the live steam will enter port c^4 and pass through ports $c^2 b^1$ into the lower part of the steam-cylinder, and move the piston back before it has finished its stroke, and thus the reversing of the engine is achieved. The face of the valve C may be depressed or sunk at C¹ to partly equalize the steam-pressure and lessen the friction. The valve C turns on a circular flange, C², occupying the circular rabbet in the exhaust-port b^2 . The valves C are operated by stems $h h^1$, to which are keyed forked arms h^2 , engaging in lugs C³ on the valve C. The stems $h h^1$ are connected together in the hub of the reversing-lever H by set-screws, so as to allow adjustment of valves C on their seats. h^4 is a stop guide for lever H. G is an arm keyed on the horizontal rock-shaft G¹, connecting with reversing-lever H by connecting-rod h^3 . G² is an arm keyed on the rock-shaft G¹, connecting with check-rope G³ by means of links g and hubs g^1 . The links g are jointed both to the lever G² and also to the hubs or brackets g^1 , so as to permit the side movement of the end of the lever G² (in its oscillation) to take place without drawing the rope G³ from side to side, and thereby displacing it and changing its tension. I is a disk or other suitable valve arranged in the steam-supply pipe, the stem of which is provided with an arm, i , which is operated by the reversing-lever H through the connecting-rod i^1 . The purpose of this arrangement is to automatically shut off steam from the steam-chest when the engine is at rest, and thereby prevent the excessive steam-pressure on the valve C, and lessen the friction of the same, met with in operating said reversing-valve C, and at the same time prevent the condensing of the steam in the steam-chest, &c. J is an endless screw upon the main or crank shaft F, which drives a worm-wheel, J¹, keyed on the shaft j of the hoisting-drum J². The drum J², on which the hoisting-rope is wound, is mounted loosely on its shaft j . J³ is a hub keyed on the shaft j , which is provided with spring pawls or dogs j^1 , which engage in the circular ratchet j^2 , formed on the drum J². K is a grooved pulley secured to the shaft G¹; said pulley carries a cord, k , passing over suitable

pulleys to connect with the weighted lever-arm K¹ of the brake. k' is the brake-band pivoted in standard K², passing under the drum and secured to the end of the lever K¹. By this arrangement the brake is automatically brought into action when the elevator-platform is descending or at rest, and is thrown out of action when the elevator is ascending by the grooved pulley K and cord k lifting the brake-lever K¹. L is the top cross-bar of the elevator, to which the wire rope is attached by means of the sliding strap L¹. L² are straight dogs pivoted in the cross-bar L, the ends of which engage in ratchet-bars L³, secured to the guide-posts L⁴ of the elevator. l is a spring passing through the strap L¹, the ends of which are secured to the dogs L², and keep them out of engagement with the ratchet-bars L³, secured to the guide-post L⁴, until the wire rope becomes broken or disengaged; in that case the strap L¹ descends, allowing the spring to force the dogs L² into engagement with the rack-bars L³, and thus prevent the falling of the elevator. M are pipes for carrying off the water condensed in the steam-chests and cylinders. g^3 are collars attached to the rope G³, which are acted on by a ring-arm, g^4 , to draw the rope and stop the engine when the platform has reached its highest or lowest elevation.

I claim—

1. The combination and arrangement of check-rope G³, links g , hubs g^1 , and arm G², as and for the purpose set forth.
2. The combination and arrangement of check-rope G³, shaft G¹, arm G², arm G, link h^3 , reversing-lever H, stems $h h^1$, forked arm h^2 , and valve C, as and for the purpose set forth.
3. The combination and arrangement of check-rope G³, shaft G¹, arm G², grooved pulley K, cord k , weighted lever K¹, and brake-band k' , as and for the purpose set forth.
4. The drum J², mounted loosely on its shaft j , and provided with circular ratchet-teeth j^2 , in combination with spring-dogs j^1 and hubs J³, substantially as and for the purpose set forth.
5. The combination and arrangement of check-rope G³, shaft G¹, arm G², grooved pulley K, cord k , weighted lever K¹, brake-band k' , drum J², ratchet j^2 , spring-dogs j^1 , hubs J³, and shaft j , as and for the purpose set forth.
6. The dogs L², pivoted in cross-bar L, in combination with the straps L¹, spring l , ratchet-bars L³, and guide-posts L⁴, as and for the purpose set forth.

In testimony of which invention I have hereunto set my hand.

PETER W. MELLEN.

Witnesses:

SAML. KNIGHT,
ROBERT BURNS.