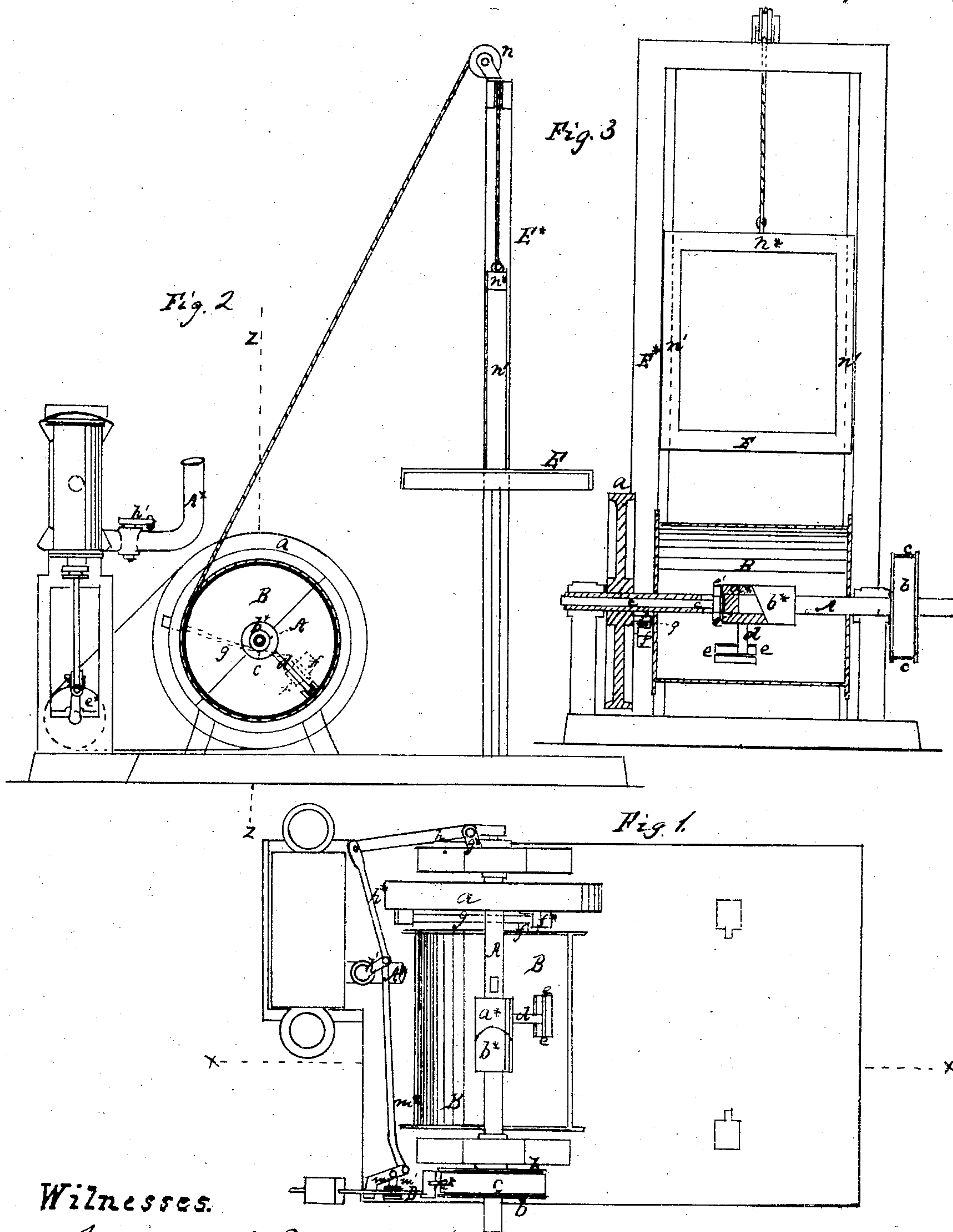


C. R. Otis.

Hoisting Apparatus.

N^o 76240

Patented Mar. 31, 1868.



Witnesses.

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Letters Patent No. 76,240, dated March 31, 1868; antedated March 25, 1868.

IMPROVEMENT IN HOISTING-APPARATUS.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHARLES R. OTIS, of Yonkers, in the county of Westchester, and State of New York, have invented certain new and useful Improvements in Hoisting-Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a portion of this specification, in which—

Figure 1 is a plan view and partial horizontal section of an apparatus constructed according to my invention.

Figure 2 is a vertical longitudinal section of the same, taken in the line $x x$ of fig. 1.

Figure 3 is a vertical transverse section of the same, taken in the line $z z$ of fig. 2.

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

This invention relates more especially to that class of elevators employed in hotels and other buildings for raising or lowering persons or materials from one story to another, and its object is to provide a means whereby the moving platform of the apparatus, when checked in its descent by accidental or other causes, will be enabled to automatically stop the motion of the operating-drum, and thus prevent all liability of subsequent accident, which would otherwise be likely to result from the continued unwinding of the rope which sustains the aforesaid platform.

The invention consists in so combining the aforesaid drum with a valve in the supply-pipe of a steam or other suitable engine, that when the drum is released from the tension of the suspending-rope, it will actuate the valve to stop the engine, and thus prevent the further unwinding of the rope.

The invention further consists in the operation, by similar means, of a friction-brake upon a suitable friction-wheel secured upon the shaft of the drum, whereby the more effectual retention of the drum in a fixed position, when stopped, as just mentioned, is obtained.

The invention further consists in certain novel means of securing the most efficient operation of the leading features of the invention.

To enable others to understand the construction and operation of my invention, I will proceed to describe it with reference to the drawings.

The horizontal shaft A, supported in suitable bearings, is furnished at one end with a band-wheel, a , and at the other with a friction-wheel, b . This shaft is, furthermore, provided at its central part with an annular slide, a^* , the inner end of which is inclined or cam-shaped, and fits against a cylindrical enlargement, b^* , formed upon the shaft, with its inner end corresponding in shape with that of the slide just mentioned, in such manner that when the slide a^* is turned with reference thereto, the cam-shaped ends just described will force the slide outward therefrom, to operate a sliding rod, c , which is situated in a central longitudinal slot in one end-portion of the aforesaid shaft, and is furnished with lateral spurs e , which project through suitable lateral slots in each shaft, as shown more fully in fig. 1. The slide a^* is formed with a radial arm, d , the outer end of which fits into a longitudinal guide, e , formed upon the inner surface of one side of the hollow drum B, which may be of any suitable construction, and through the longitudinal axis of which is passed the shaft A. Projecting from that end of the drum adjacent to the band-wheel a , is a stud, f , which is acted upon to rotate the drum by means of a similar stud, f^* , extending inward from the said band-wheel, which is furthermore provided, at its inner side, with a curved spring, g , the extremity of which rests against the stud f of the drum, and which, during the rotation thereof by means of the stud f^* , as just mentioned, is held in a straight position, its extremity being clamped, as it were, between the two studs $f f^*$, as indicated in dotted outline in fig. 2.

Pivoted to a suitable supporting-bar, g^* , is a lever, h , the lower arm of which is situated in contact with the outer extremity of the sliding rod c of the shaft A, and the upper arm of which is connected by a rod, h^* , with a short lever, h' , attached to the stem of a suitable valve, placed in the supply-pipe A^* of the engine, in such manner that the outward movement of the aforesaid rod c will operate to close the valve just mentioned, and thus stop the engine.

The driving-shaft of the engine is shown at z , and is provided with a pulley, e^* , which rotates the band-wheel a , by means of a suitable band. Placed around the periphery of the friction-wheel b is a friction-brake, formed by an elastic or flexible sheet-metal band, C, the ends of which are attached to two short arms, k , of

a loaded lever, D. A short horizontally-moving lever, m , pivoted upon a suitable upright, m' , has its forward arm connected by a rod, m^* , with the lever h' of the valve in the supply-pipe, in such manner that when the said valve is opened, the rear end of the said lever m will be situated underneath the loaded lever D, to prevent the friction-band C from coming in frictional contact with the wheel b ; and when the lever h' is moved to close the valve, as hereinbefore described, the aforesaid rear end of the lever m will be brought away from the loaded lever, to allow the same to descend to tighten the friction-band upon the friction-wheel, to retain in a stationary position the shaft A.

The vertically-moving platform of the apparatus is represented at E, and slides between suitable vertical guides E^* , above which is situated a pulley, n . The suspending-rope F extends from a cross-bar, n^* , secured to the upper ends of the vertical bars n' of the platform E, over the pulley n , to the drum B, in such manner that the winding of the rope upon the drum will elevate the platform, and *vice versa*.

In raising the platform, the drum B is rotated in the direction of the arrow, shown in fig. 2, by means of the band-wheel, as hereinbefore explained, the said motion of the drum being reversed in lowering the platform, the weight of which keeps the suspending-rope tense, and consequently holds the studs ff^* pressed toward each other during such lowering-operation, except in case the downward movement of the platform is stopped, as by some obstruction underneath the same, in the event of which, the spring g , assuming a curved form, turns the drum a portion of a revolution in advance of the movement of the band-wheel a , or, in other words, of the shaft A, which, moving the arm d of the annular slide a^* , turns the same in such manner as to be forced outward, as hereinbefore explained, and, acting through the lever h and connecting-rod h' , operates the valve in the supply-pipe A^* of the engine, to stop the said engine, the same movement of the valve aforesaid causing the withdrawal of the rear end of the lever m from underneath the loaded lever D, whereupon the descent of the said loaded lever tightens the friction-band C upon the friction-wheel b , and thus insures the retention of the same in a fixed position, so that by these means any further unwinding of the rope is prevented, and any liability of the occurrence of accident in case of the sudden removal of the obstruction is effectually provided against.

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

1. So combining the drum B with the steam-valve and friction-brake, that when released from the tension of the suspending-rope it shall automatically cut off the steam from the engine and tighten the brake against the wheel, substantially as herein set forth.
2. The studs ff^* and spring g , in combination with the band-wheel a and drum B, whereby the drum is moved in advance of the band-wheel when released from the tension of the suspending-rope, substantially as herein set forth.
3. The cam-faced annular slide a^* , furnished with an arm, d , connected with the drum B, in combination with the cam-faced enlargement b of the shaft A, and the sliding rod c , whereby the turning of the aforesaid slide is caused to operate the valve in the supply-pipe A^* , substantially as herein set forth.
4. The rod m^* and lever m , so combined with the valve in the supply-pipe A^* , and the loaded lever D of the friction-brake, that the said brake shall be held away from the friction-wheel b when the valve is opened, substantially as herein set forth.

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Witnesses:

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