

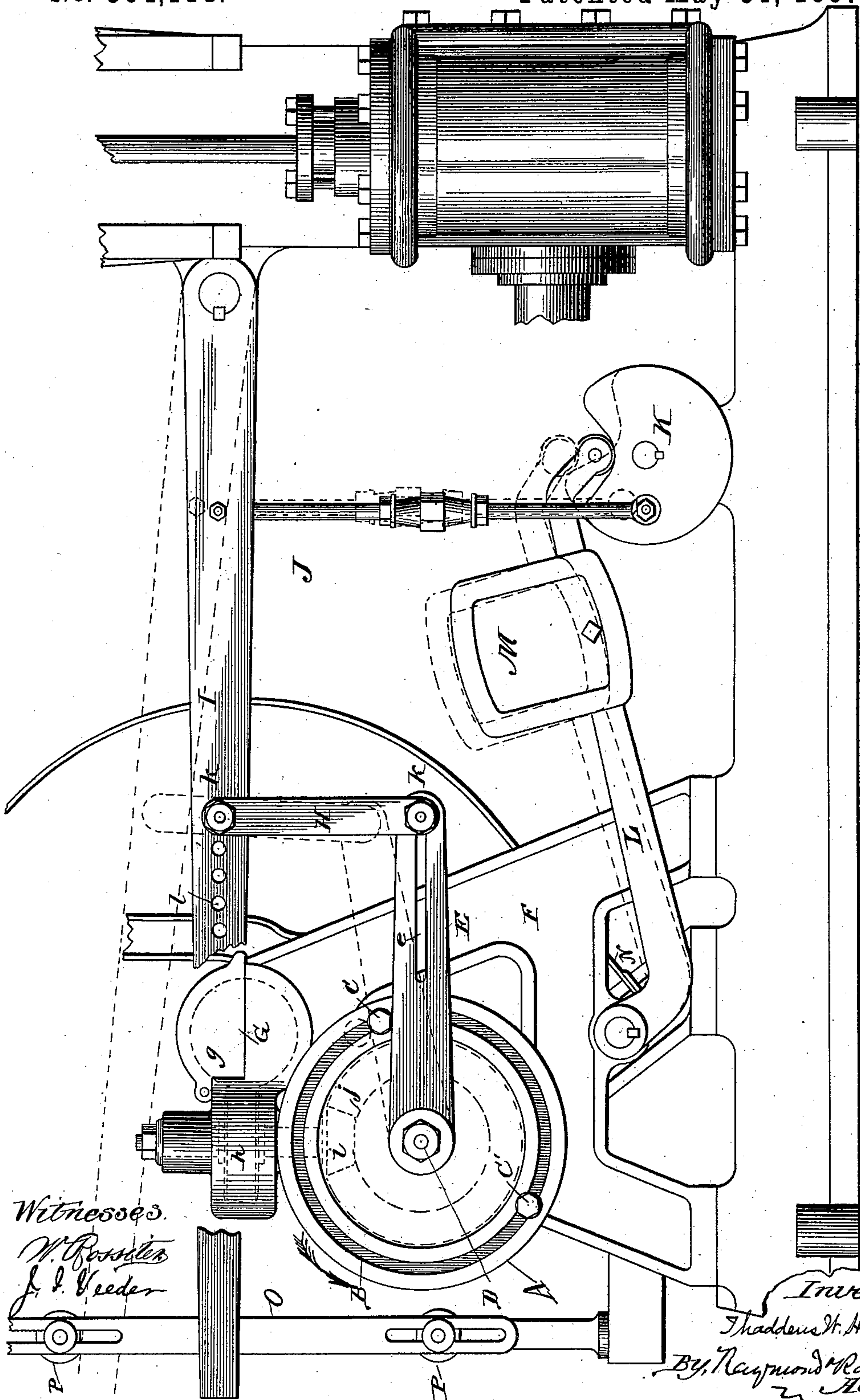
(No Model.)

T. W. HEERMANS.

LIMIT STOP FOR HOISTING DRUMS.

No. 364,111.

Patented May 31, 1887.



Witnesses.

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UNITED STATES PATENT OFFICE.

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LIMIT-STOP FOR HOISTING-DRUMS.

SPECIFICATION forming part of Letters Patent No. 364,111, dated May 31, 1887.

Application filed August 9, 1886. Serial No. 210,492. (No model.)

To all whom it may concern:

Be it known that I, THADDEUS W. HEERMANS, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Elevators, of which the following is a full description.

The function of my invention is the prevention of the overrunning of the limits of the hoist by the cage; and it consists in an improved device for automatically bringing the engine unerringly and positively to rest when the elevator car or cage has reached the top or bottom of the shaft. The requisites of a device for this purpose are, that it shall be easily adjusted for any length of hoist, shall be so simple and strong as to reduce the liability to derangement to the minimum, and shall be so adjustable to the speed of the engine, when the latter is started, stopped, and reversed by a single lever, as that it may bring the controlling-lever to a central position, and not beyond, as in the latter event the engine would be reversed or start in the opposite direction. To combine these requisites in larger measure than heretofore, and specially to guard against the reversal of the engine, is the object of my invention.

The drawing shows a side view of my stop and so much of a hoisting-engine as is necessary to show its attachment thereto.

A is a disk, which revolves on the stud D, attached to the frame F of the hoisting-drum.

B is a T-slot containing the stops or studs C C', which may be made fast in any part of the slot. The disk A receives motion from the shaft G of the hoisting-drum through the worm and gear *g h* and bevel-gears *i j*, or other suitable gearing, it being only necessary that the ratio of the motion of the shaft G and disk A should be such that the greatest elevation of the elevator should correspond with less than a complete revolution of the disk A.

The ratios of the gearing, which is intermediate between the hoister-shaft and the disk A, necessary to drive the disk A in the manner just specified, can be easily determined when the number of revolutions of said shaft corresponding to the extreme travel of the cage is known. The revolutions of said shaft may in

like manner be ascertained or determined when the extreme travel of the cage and the diameter of the drum are known or fixed upon.

Pivoted upon the stud D is the lever E, slotted at *e* and connected by the link H to the lever I, controlling the engine through a slide-valve of such construction as that, when the lever and valve are central, steam is shut off from the cylinder, and a movement of the valve on either side of the central position produces a corresponding movement of the engine in one or the other direction. This valve and its steam-chest are shown in United States Patent No. 133,926, to C. S. Crane. A series of holes, *l l*, and the slot *e* allow the adjustment of the link H, so as to vary the relative movements of levers E and I, as hereinafter explained. The lever I is steadied by the upright O, and is limited to a proper length of movement by the stops P P. Neither upright O nor stops P are essential.

The connection J, cam K, lever L, and weight M operate the band-brake N, so that the brake is applied automatically when the controlling-lever I is in its middle position. It assists the action of the stop in bringing the engine to rest without reversal, but forms no part of the present invention, and is not essential to its operation.

The operation of the stop is as follows: Supposing the elevator to be at the top of the shaft, to descend, the lever I is raised to the position indicated by dotted lines by the operator through any of the ordinary lever or rope attachments, such as the hand-rope passing through the car or any of the equivalents therefor. As the cage descends the disk A revolves in the direction shown by the arrow, and on the approach of the cage to the bottom of the shaft the stop C comes in contact with the lever E, carrying it and the lever I to the position shown in full lines, in which steam is entirely shut off and the engine is at rest. The movement of the lever I is so timed that the momentum of the parts is just sufficient to carry the lever to its central position after steam is shut off, but is not so rapid as to pass the central position and reverse the engine. This adjustment is effected by shifting the link H in

the slot *e* and to corresponding holes, *l*, in lever *I*. The stop *C'* comes into action when the cage reaches the top of the shaft, its action being similar to but in the reverse direction of the stop *C*.

I have thus specifically described my invention in its application to a hoisting-engine controlled by a peculiar arrangement of lever and valve; but I do not wish to be restricted to its use in this connection only, for it is capable of adaptation to any hoisting-engine, whether operated by the ordinary link-motion or other reversing device, connection being made either with the reverse lever or the stop-valve, if one be used, as may be desired.

Various modifications of the lever *E* and disk *A* may be made without departing from my invention—as, for example, the lever *E* might be pivoted outside the disk *A*, projecting over the latter only enough to allow the stop to act upon it. The disk *A* could in many cases be reduced to a sector; and other modifications of details will occur to the skilled mechanic, or be suggested by the application of the stop to other forms of engines, the essential features of the

stop being the disk geared in the ratio to the hoisting-shaft previously described, and carrying stops which act through an intermediate lever, which may be adjustable on the controlling lever or valve of a hoisting-engine.

I claim—

1. In a limit-stop for hoisting-machines, the slotted disk *A*, stops *C C'*, and the lever *E*, adjustably connected to the controlling-lever, all combined to operate substantially as shown and described.

2. In combination, a slotted disk geared to the hoisting-drum in the ratio described, provided with stops, an intermediate lever, and the controlling-lever of a hoisting-engine, substantially as described.

3. The slotted disk *A*, geared to the hoisting-drum in the ratio described and carrying stops *C C'*, in combination with the lever *E*, the connecting-link *H*, and the controlling-lever of the engine, substantially as described.

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Witnesses:

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