

(No Model.)

W. E. NICKERSON.
SLACK ROPE STOP FOR ELEVATORS.

No. 404,014.

Patented May 28, 1889.

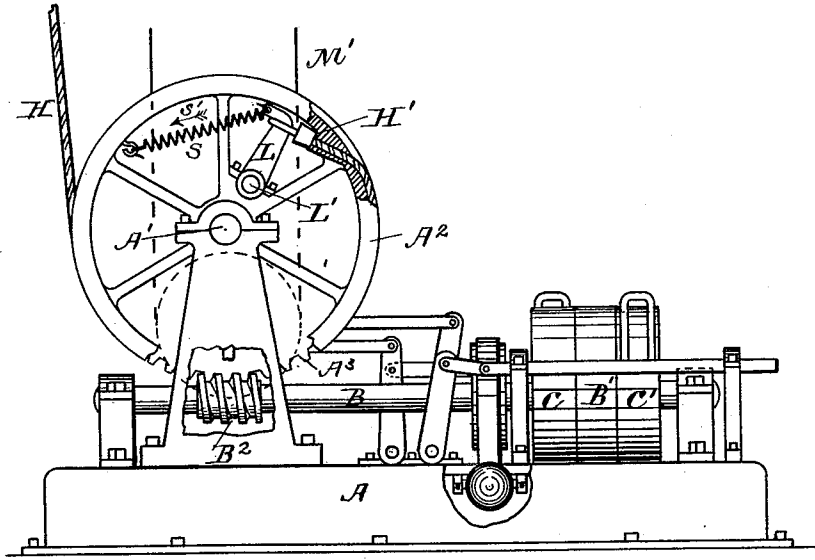


FIG. 1.

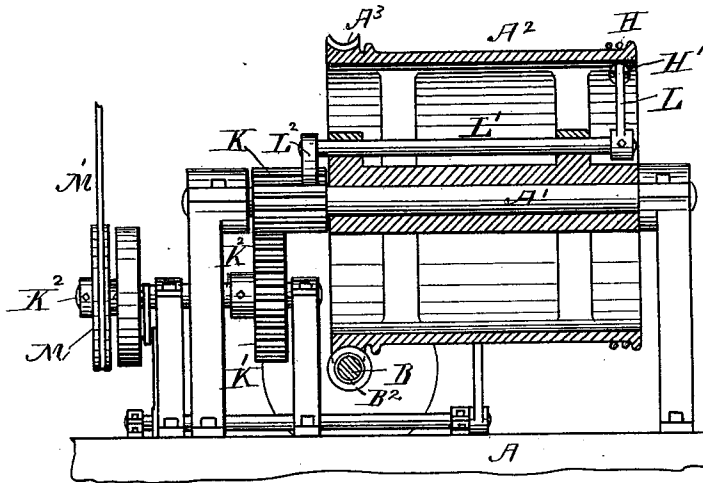


FIG. 2.

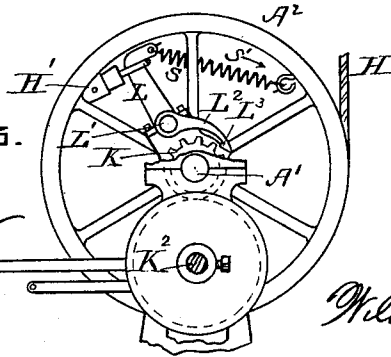


FIG. 3.

WITNESSES.

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SLACK-ROPE STOP FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 404,014, dated May 28, 1889.

Application filed February 15, 1889. Serial No. 299,956. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EMERY NICKERSON, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Slack-Rope Stops for Elevators, of which the following, taken in connection with the accompanying drawings, is a specification.

The object of my invention is to apply a simple and reliable device to the winding-drum of an elevator, so that in case the hoisting-rope from any cause becomes slack an automatic device at once acts on the hand-rope wheel and ships the driving-belt onto the loose pulley, and thus stops the further movement of the hoisting mechanism. This object I attain by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a side elevation of the essential parts of the hoisting apparatus of an elevator, in connection with which I show one method of applying my device. Fig. 2 is a view, partly in elevation and partly in vertical section, showing the more immediate parts to which my device relates. Fig. 3 shows details in elevation.

In the drawings I have shown my device as applied to an elevator in which the power is transmitted by means of belts, and the controlling mechanism consists of a belt-shipping apparatus; but my invention will apply also to an elevator of which the hoisting mechanism is operated by steam, air, or hydraulic pressure without the intervention of belts, in which case the working effect of my device will be transmitted to the controlling mechanism by such means as the case requires—by levers and valves, for instance.

A, Figs. 1 and 2, represents the bed-plate or base of an elevator hoisting-machine; A², the winding-drum, and A' its shaft. This drum is driven by means of a gear and worm, A³ B², B being the worm-shaft, upon which the fast pulley B' and the loose pulley C C' are mounted. The belt-shipping and brake devices are of the ordinary construction, and need not be especially referred to.

The hoisting-rope H passes through the shell of the winding-drum A² at an acute angle with a tangent to the rim of the drum at that part, so that the rope, when slack, may be drawn in by the action of the spring-re-

tractor S, and has a rope-end coupling-piece, H', firmly affixed to its end. The rope-end coupling-piece H' is attached to the arm or hook L of a rocker-shaft, L', which is located within the winding-drum A² and quite near the central shaft, as shown. On the rocker-shaft L', I place a pawl, L², said pawl being rigidly attached, so that any movement of the shaft L' will cause a corresponding movement of the pawl L². The swinging end of the pawl L² has a hook, L³, Fig. 3, which engages with the teeth on the pinion K. The pinion K rotates independently of the shaft A' of the winding-drum and engages with the gear-wheel K', firmly fastened to the shaft K² of the hand-rope wheel M, through which the belt-shipping mechanism is operated.

The arm L of the rocker-shaft L' is connected to a spring-retractor, S, Figs. 1 and 3, which has a tendency to draw the arm in the direction of the arrow S', and will so draw it unless it is held back by the hoisting-rope, when under strain, in its normal position, as shown in the drawings. When the arm L is held by the hoisting-rope in its normal position, it, acting through the rocker-shaft L', holds the hook L³ of the pawl L² away from the teeth of the pinion K, and as the pinion K is free on the shaft A' the winding-drum can revolve in either direction without imparting its motion to the pinion K.

The operation of my device is as follows: If the hoisting-rope H, from any cause, becomes slack while the drum is in motion and lowering the carriage, (which happens when some obstruction checks the descent of the carriage,) then it at once (being resilient) loosens on the drum and will no longer withstand the tension of the spring-retractor S on the arm L. As a consequence the arm L will move in the direction of the arrow S', and will turn the rocker-shaft L' sufficiently to cause the hook L³ of the pawl L², Figs. 2 and 3, to engage with the teeth of the pinion K and cause the pinion K to rotate with the drum A². This rotation of the pinion K will cause the gear K', shaft K², and hand-rope wheel M to rotate in such a direction as to throw, by means of the belt-shipper, the lowering-belt off from the fast pulley, and thus stop the hoisting apparatus from further operation. The object of thus stopping the

drum is to prevent the slack rope from being entangled with the machinery, and thereby causing damage to the rope or other parts.

My device is self-setting, for as soon as the rope H has its normal strain upon it the arm or hook L will be drawn over, so as to lift the pawl L² out of contact with the teeth of the pinion K.

From an examination of the above it will be understood that my device consists in attaching the drum end of the hoisting-rope to a retractor, the reaction of which, when the rope becomes slack, will, by a transmitting device, act on the controlling mechanism of the elevator and stop its further motion.

I claim—

1. In an elevator hoisting device, the combination of the winding-drum A², rigidly fixed to its shaft, and hoisting-rope H, with a movable rope-end coupling and retractor S, said end coupling having a transmitting mechanism adapted to operate the belt-shipping device, substantially as and for the purpose set forth.

2. In an elevator hoisting device, the combination of the winding-drum A², rigidly fixed to its shaft, and hoisting-rope H, with the spring-retractor S, and a transmitting mechanism adapted to set a pawl or other clutch device in working connection with the controlling device of the elevator, substantially as and for the purpose set forth.

3. In an elevator hoisting device, the combination of the winding-drum A² and rope H with the arm or hook L, spring S, rocker-shaft L', pawl L², pinion K, gear K', shaft K², and hand-rope wheel M, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 14th day of February, A. D. 1889.

WILLIAM E. NICKERSON.

Witnesses:

FRANK G. PARKER,
MATTHEW M. BLUNT.