(No Model.) 2 Sheets—Sheet 1.

H. LECHTENBERG.

AUTOMATIC STOP DEVICE FOR HOISTING MECHANISM.

No. 457,730. Patented Aug. 11, 1891.

Fig. 1.

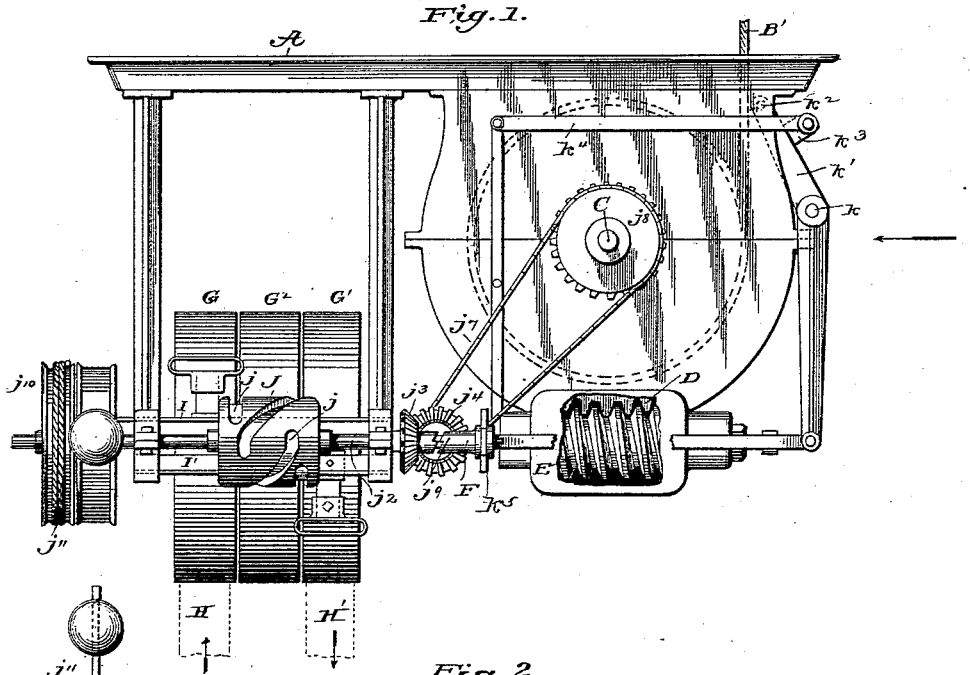
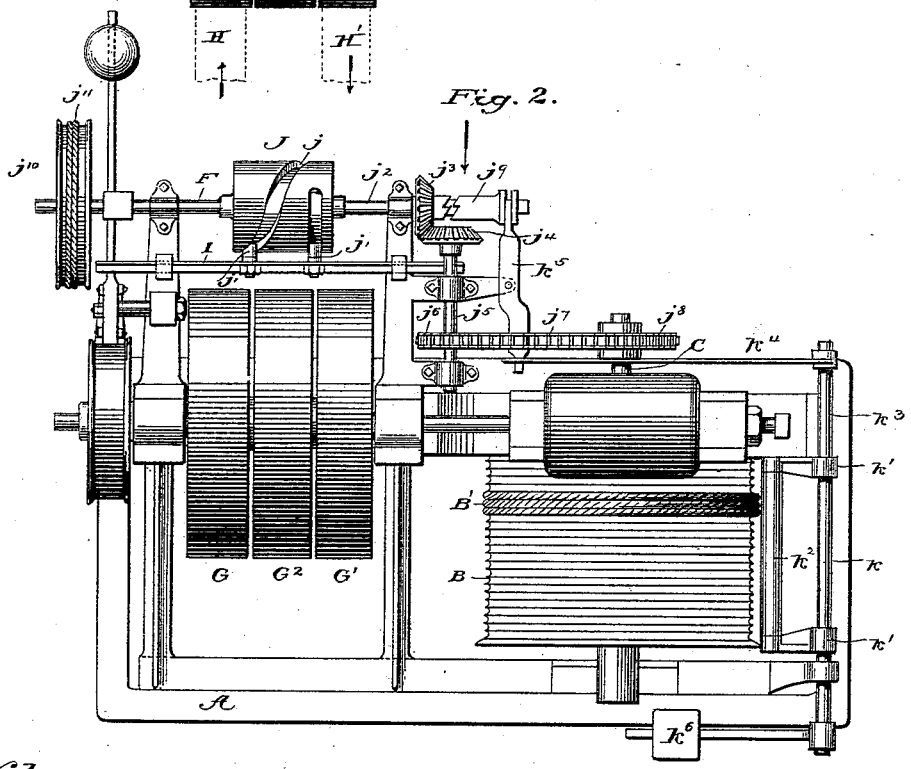


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

H. LECHTENBERG.

AUTOMATIC STOP DEVICE FOR HOISTING MECHANISM.

No. 457,730. Patented Aug. 11, 1891.

Fig. 3.

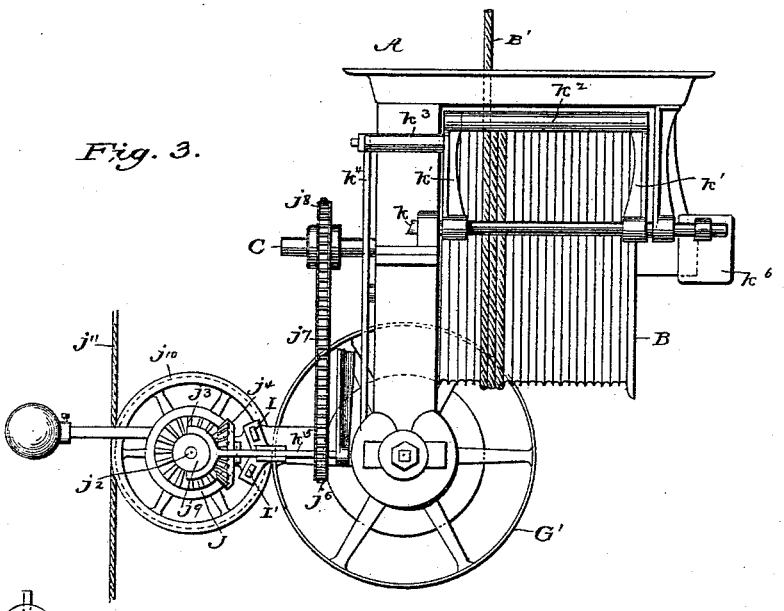
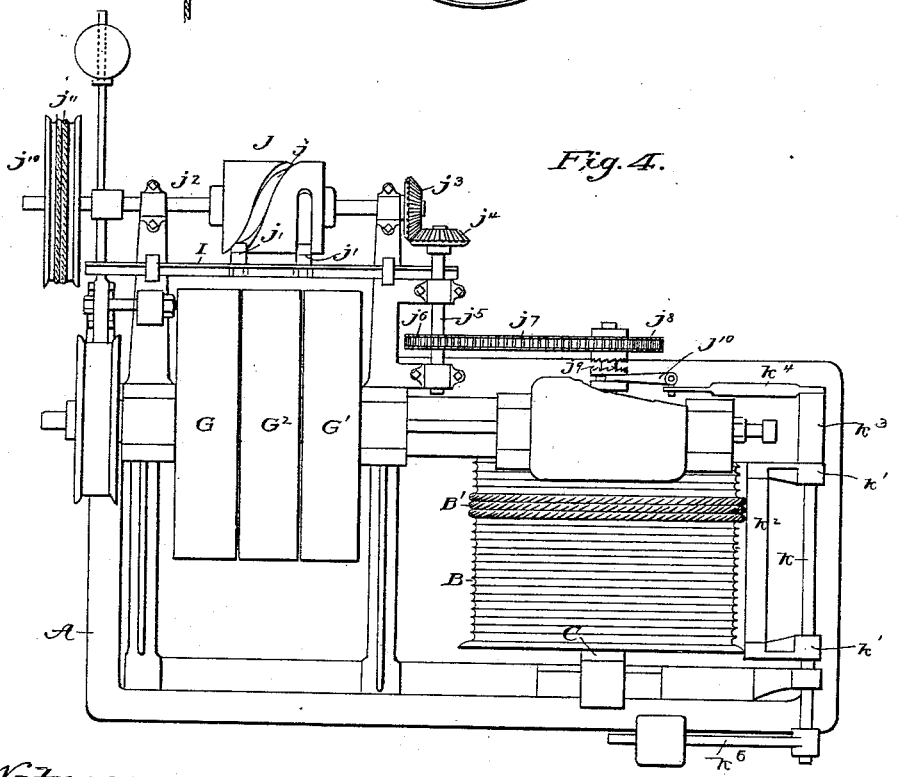


Fig. 4.



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Inventor:
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By Phil. T. Dodge Atty

UNITED STATES PATENT OFFICE.

HENRY LECHTENBERG, OF QUINCY, ILLINOIS.

AUTOMATIC STOP DEVICE FOR HOISTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 457,730, dated August 11, 1891.

Application filed April 25, 1890. Serial No. 349,489. (No model.)

To all whom it may concern:

Be it known that I, HENRY LECHTENBERG, of Quincy, in the county of Adams and State of Illinois, have invented certain Improvements in Automatic Stop Devices for Hoisting Mechanism, of which the following is a specification.

In the operation of elevator guards or cages which are raised and lowered by a cable passing thence to a hoisting-drum it occasionally happens that the descent of the car is temporarily arrested by an obstruction while the drum continues to slacken the cable, with the result that the removal or giving away of the obstruction is followed by the fall of the car. My invention is intended to avoid this danger; and it consists in devices for shifting the driving-belts of the hoisting-drum, connected with and driven from the drum, subject to the controlling influence of the cable, in the peculiar form and manner hereinafter described and pointed out.

In the accompanying drawings, Figure 1 is an elevation of a hoisting mechanism with my invention incorporated therein, looking in the direction indicated by the arrow in Fig. 2. Fig. 2 is a bottom plan view of the same. Fig. 3 is an elevation looking in the direction of the arrow in Fig. 1. Fig. 4 is a bottom plan view showing the modification.

Referring to the drawings, A represents a rigid main frame in any form adapted to sustain the operative parts; B, the winding-drum mounted on a horizontal shaft; C and B′, the hoisting-cable, extended from the drum over suitable guides to the car, cage, or platform which is to be raised and lowered. At the end the drum is provided with a worm-wheel, through which it receives motion from a worm E on horizontal shaft F, provided with two loose pulleys G and G′ and the intermediate fixed pulley G^2. The driving-belts H and H′, from an engine or other motor running constantly in reverse directions, are applied to the pulleys, as shown, so that by shipping one or the other of the belts upon the middle pulley the drum may be driven in either direction at will and the car raised or lowered, as required.

The shipping of the respective belts is effected by two independent shipping-bars I and I′, of ordinary form, mounted to slide horizontally in the frame across the face of the belts, the movement of both bars being effected by a cam-wheel J, provided with suitably-shaped slots j, which receive studs or rollers j' on the respective bars. The cam-wheel J is fixed on shaft j^2, carrying a loose beveled pinion j^3, engaging pinion j^4 on the shaft j^5, which is in turn connected through its sprocket-wheel j^6 and chain j^7 with a sprocket-wheel j^8 on the shaft of the winding-drum. A sliding clutch j^9, splined to the shaft j^2, serves to lock the pinion j^3 thereto when required.

The clutch j^9 is controlled automatically in the following manner: The rock-shaft k is seated horizontally in bearings along the face of the drum and provided with crank-arms k', which carry a roller k^2, riding against and held in an elevated position by the hoisting-cable B′ when the latter is under tension. This rock-shaft also carries at one end a weighted arm k^6 and at the opposite end a projection k^3 from one of the crank-arms, the projection being in turn connected by link k^4 with a lever k^5, which is pivoted at its middle to the frame and arranged to act at its outer end on the clutch j^9. When the cable is under tension and the parts properly operating, the roller, being held in its upper position by the cable, acts through the intermediate parts to keep the clutch j^9 out of action, so that the belt-shipping cam J is left wholly free from the influence of the safety-stop mechanism.

The rotation of the cam to stop, start, and reverse the motion of the drum and car is effected by a pulley j^{10}, applied to its shaft and provided with a hand-rope j^{11}, extending vertically past the car, as usual. If from any cause the hoisting-cable B′ is improperly slackened, it permits the roller k^2 to fall toward the drum, the effect being to turn the rock-shaft k, and, through the intermediate parts, throw the clutch j^9 into action, so that motion will be communicated from the hoisting-drum through the intermediate gearing to the cam-wheel J, and the latter thereby turned so as to actuate the shipping-bars and shift the belts to stop the unwinding action of the drum.

Referring now to the construction shown in

Fig. 4 it will be perceived to be practically identical with that above described, the only difference being that the clutch is located at a different point in the driving-train. The clutch j, instead of being located on the shaft j^2, is located on the drum-shaft, in order to lock the sprocket-wheel j^8 thereto. The pinion j^3, instead of being loose on the cam-shaft, is fixed thereon. The clutch is operated by an elbow-lever j^{10}, pivoted to the frame and connected at its rear end by link k^4 to a crank-arm on the shaft k, which is provided with crank-arms k', carrying roller k^2, acted upon by the cable, as in the first instance. The slackening of the cable raises the roller k^3, which, through the intermediate parts, throws the clutch into action with precisely the same effect as in the arrangement first described.

Having thus described my invention, what I claim is—

1. In an elevator, the winding-drum, its hoisting-cable, the fast and loose pulleys, and gearing connecting the fast pulley with the drum, in combination with the belt-shipping slides, the cam-wheel to move them, a gear-train connecting the cam-wheel with the drum, said train including a clutch to permit stoppage of the cam-wheel, a gravitating roller resting against the hoisting-cable, and devices connecting the roller with the clutch, whereby the slackening of the cable causes the drum to actuate the belt-shipping devices.

2. In a hoisting device, the combination of the winding-drum, its cable, the driving-pulleys, the belt-shipping devices, the operating-cam therefor, its driving-shaft, the bevel-gear on said shaft, the bevel-gear j^4, engaged thereby, its driving-shaft, the sprocket-wheel on said shaft, the sprocket-wheel on the drum-driving shaft, the sprocket-chain connecting the said sprocket-wheels, the clutch, the frame arranged in the path of the cable, and the connection between the frame and clutch.

In testimony whereof I hereunto set my hand, this 19th day of February, 1890, in the presence of two attesting witnesses.

HENRY LECHTENBERG.

Witnesses:
JAMES F. CARROTT,
W. F. BRINTEN.