(No Model.) 3 Sheets—Sheet 1.

W. LOUDEN.

HAY ELEVATOR.

No. 530,232. Patented Dec. 4, 1894.

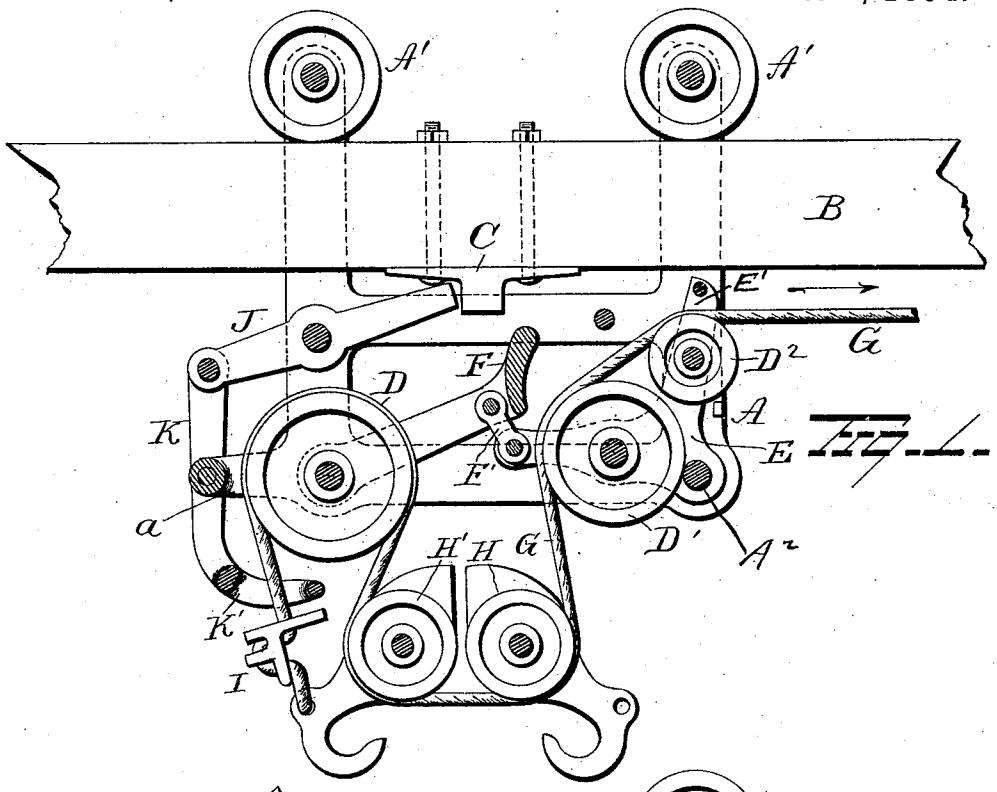

Fig. 1.

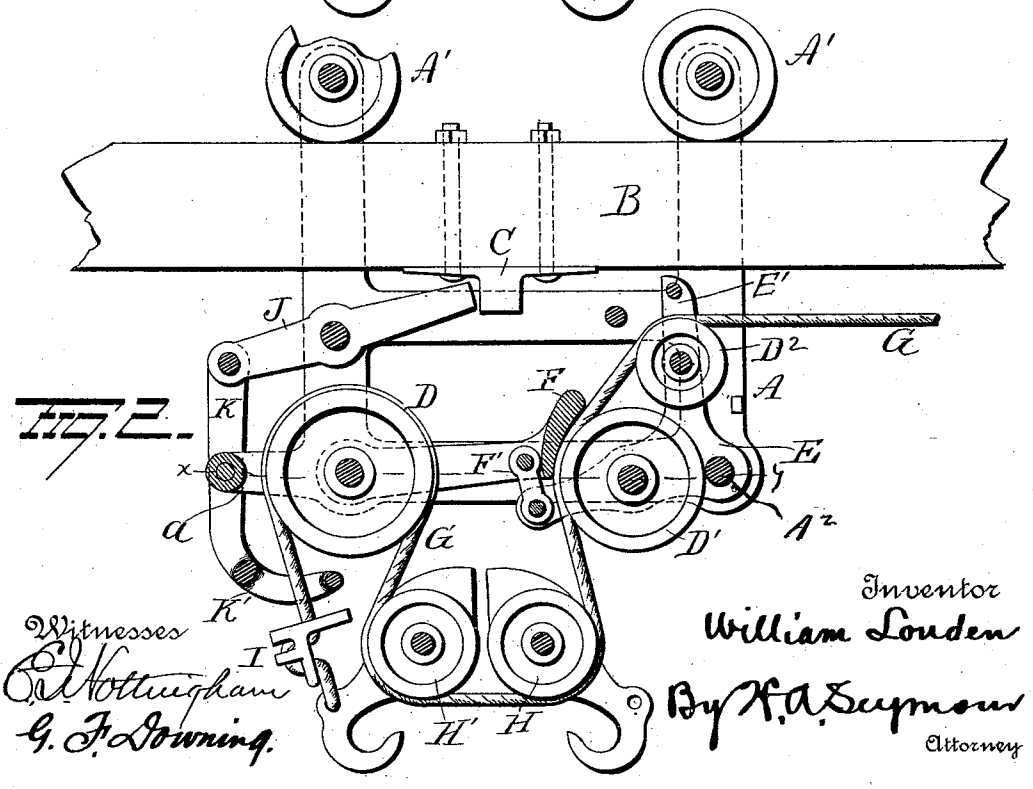

Fig. 2.

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(No Model.) 3 Sheets—Sheet 2.

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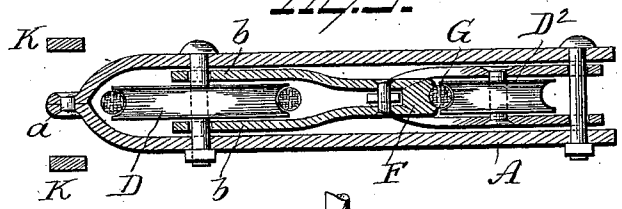
Fig. 3.



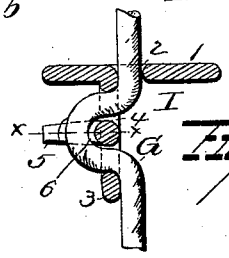


Fig. 4.

Fig. 5.

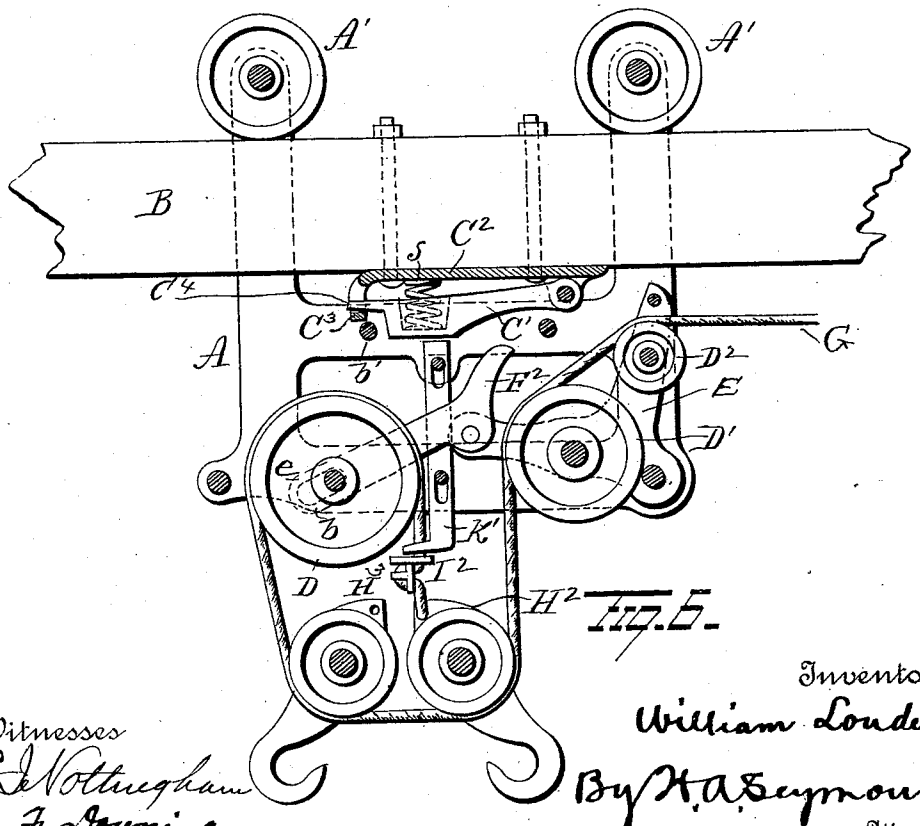


Fig. 6.

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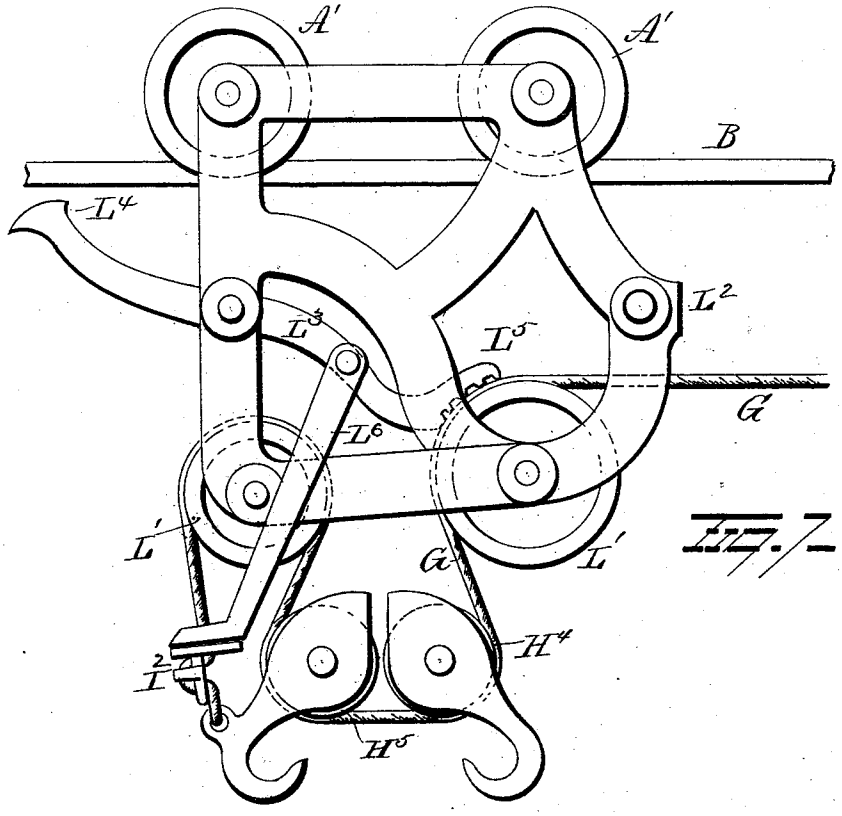

Fig. 1.

Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM LOUDEN, OF FAIRFIELD, IOWA.

HAY-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 530,232, dated December 4, 1894.

Application filed July 1, 1893. Serial No. 479,366. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LOUDEN, a resident of Fairfield, in the county of Jefferson and State of Iowa, have invented certain new and useful Improvements in Hay-Elevators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to hay carriers in which a brake, or other locking device is used to catch and hold the hoisting rope, and thus sustain the load while the carrier is traversing the track; and it consists first, of a tilting frame or housing adapted to receive the hoisting rope and permit its passage therethrough, said tilting frame being pivoted in the frame of the carrier and connected to the brake which is also mounted in the carrier frame so that the passage of the hoisting rope through the tilting frame in one direction will automatically release the brake from the rope and its passage through said frame in the opposite direction will automatically bring the brake in engagement with the rope.

It further consists of a set of compressing pulley blocks hung in the loop of the hoisting rope which is formed by its passage through the carrier, one end of the hoisting rope being passed over a sheave in the carrier frame and brought down from the carrier and connected to one of the pulley blocks, and a stop placed upon said end of the rope between the carrier and the pulley block to which it is connected, so as to prevent the pulley blocks with their load from being drawn against the frame of the carrier or be arrested with a jar by the stop on the rope and to release the carrier from a stop on the track.

It further consists of combinations and arrangements of parts set forth in the following specification and pointed out in the claims.

In the accompanying drawings Figure 1 is a side elevation of a carrier embodying my invention, the front side of the carrier frame being removed. Fig. 2 is a similar view showing the brake engaging the rope. Fig. 3 is a sectional view on the line *x*—*y* of Fig. 2. Fig. 4 is a vertical section of an improved form of stop to place upon the hoisting rope. Fig. 5 is a sectional view of this stop on the line *x*—*y* of Fig. 4. Fig. 6 is a modified form of carrier showing a different adjustment of the hoisting rope and compressing pulley blocks, and also a modification of the brake and its connection with the tilting frame. Fig. 7 is a further modification showing the application of the compressing pulleys and the rope stop to a common carrier.

A represents the frame of a hay carrier having wheels A′, adapted to run on a track B to which a stop C is secured. Mounted in one end of the carrier A is a sheave D, and pivotally supported at A^2 in the other end of the carrier, is a frame or housing E. In the lower end of said pivoted frame is a sheave D′ and in its upper end is an auxiliary sheave D^2.

A brake shoe or clutch F is pivoted in the carrier frame, and its free end is pivotally connected to the frame E by means of a link F′. Said brake shoe is preferably made with prongs *b* to straddle the sheave D and be pivoted to the same axle on which the sheave D turns.

A hoisting rope G is passed first over the auxiliary sheave D^2 then over the other sheave D′, then down and through the compressing pulley blocks H and H′, then up and over the sheave D in the other end of the carrier, and then down to the frame of the pulley H′, where its end is attached. The load to be elevated will be attached to the hooks of the compressing pulleys H and H′ in the ordinary way, and the power to elevate it will be applied to the free end of the rope.

It will be seen that when the load is being elevated the draft of the rope in the direction of the arrow will tilt the lower end of the frame E upward, or in the same direction the rope is moving, and this will lift the brake off the rope, as shown in Fig. 1, and let it pass freely over the sheaves. Should the horse slacken the rope, or should the rope become slackened by being detached from the horse, or otherwise, the instant it commences to run back it will draw the pivoted frame E back with it, and this will bring the brake down against the rope, as shown in Fig. 2, and will hold it from running back and this will keep the load from falling from the carrier. It will also be seen that this brake arrangement is entirely automatic, holding the brake off the rope while the rope is moving in the di-

rection of the arrow and letting the rope pass freely in this direction, but when the direction of the rope G is reversed, the brake will be brought against the rope and stop its movement, in that direction. Should the singletree break when the load is elevated nearly to the carrier, this device will instantly and automatically check the descent of the load, and thereby prevent accidents by the falling of the elevated load.

To hold the carrier A stationary on the track B a latch lever J is pivoted to the carrier frame and its inner end is adapted to engage the stop C. To the outer end of the latch lever J a depending yoke K is pivotally connected—the rear half of which only is shown in Figs. 1 and 2. The lower end of said yoke is provided with a loop K′, which stands substantially at right angles to the upper part, and through this loop the end of the hoisting rope leading down to the pulley block H′ is passed.

A portion of each side of the carrier frame is extended back horizontally from the axle on which the sheave D turns, and is riveted together at *a* as plainly shown in Fig. 3. This forms a guard to prevent the end of the rope which is secured to the pulley block H from running off the sheave D. The yoke is wide enough to straddle this portion of the carrier frame and therefore the vertical movement of the yoke will not be interfered with by it.

Upon the end of the rope extending from the carrier down to the pulley H′ a stop I is placed, the office of which is to prevent the pulleys H and H′ from being drawn against the frame of the carrier or in contact with the sheaves D or D′ thus preventing injury to any of the parts; also, to engage the loop of the yoke K and release the latch J from the stop C, and let the carrier traverse the track B. This stop I is preferably made adjustable so it may be readily slipped up or down the rope so as to regulate the height to which the pulley H or H′ will be drawn.

It will be observed that by the location of the stop on the end of the rope between the pulley block and the carrier the compressing pulleys and the load they are carrying will not be suddenly arrested by the stop coming in contact with the carrier, or the trip mechanism with which the carrier is provided, but the vertical ascent will be eased off and converted into the horizontal movement along the track by the release of the carrier from the stop on the track so as to avoid the upsetting or scattering of the load in changing from the vertical to the horizontal movement.

Any suitable form of stop may be used, but my preferred form comprises a plate or disk 1 having a central opening 2 for the passage of the rope, and an arm 3 projecting at right angles from said disk. The arm 3 is made with two perforations 4, 4, with a web between them, and from the web prongs 5, 5, project, to produce a V-shaped recess 6. The rope G after passing through the perforations or openings 2 in the disk 1 is passed through the upper perforation 4 in the arm 3, then between the prongs 5, 5, and finally through the lower perforation 4 of the arm 3. To adjust this stop along the rope all that is necessary is to slacken the rope so as to form a loop and draw it out of the V-shaped recess 6. It can then be readily slipped up or down the rope, and when the loop of the rope is drawn into the recess again, the stop will be securely held at any desired point on the rope.

The carrier being held stationary on the track by the inner end of the latch J impinging against the stop C, and power being applied to the free end of the rope G, the load which may be connected to the pulleys H and H′ while they are spread apart, will be compressed by the action of the rope on the pulleys and then elevated until the stop I strikes the loop K′ of the yoke K, and releases the latch J from the stop C. The carrier being released from the stop will be free to run along the track, and the weight of the load will draw the tilting frame E back sufficiently to bring the brake shoe F against the rope, which will hold the load suspended. The load being discharged and the carrier returned, the end of the latch will catch behind the stop, as before. The carrier being moved still farther back on the track, the upper end of the tilting frame E will come in contact with the stop C, which will tilt up the frame and release the brake from the rope, and permit the pulley blocks to descend for another load. There should be sufficient room between the latch J and the end E′ to permit the frame E to tilt downward freely and make the brake catch the rope at any point in the elevation should it be necessary.

It is preferable to have two sheaves in the tilting frame E, but it may be operated with one alone by placing it more nearly in the middle of the frame and adjusting the pivot A^2 to correspond. The brake shoe may also be mounted in any suitable way in the frame of the carrier so as to give it a movement to and from the rope which can be operated by the tilting motion of the frame E.

In the form of invention shown in Fig. 6, the carrier is substantially the same as that in Figs. 1 and 2 except in the arrangement of the pulleys, the track stop and the latching device. The brake shoe F is also somewhat modified by making slots *e* in the prongs *b* which will slide on the axle of the sheave or pulley D, by which means the link F used to connect the brake shoe to the pivoted frame E may be dispensed with, and the necessary longitudinal movement of the brake shoe be provided by slots *e*. A latch C′ is hinged to the plate C^2 which is bolted to the track B, and is arranged to impinge against a bolt *b*′ in the frame of the carrier. The plate C^2 has a depending loop C^3 which catches a finger C^4 on the latch C′ to prevent it from dropping down. A spring S may also be used to hold the latch in engagement with the bolt *b*′.

The carrier is released from the track by a stop I coming in contact with a trip bolt k' which has a vertical sliding movement in the frame of the carrier, and which lifts the free end of the catch C′ and permits the bolt b' to pass under it and let the carrier move along the track.

The rope G after passing over the pulleys D^2 and D′ in Fig. 6 is passed through the pulley blocks H^2 and H^3, and then up around the pulley D from the outside and down on the inside to the pulley block H^2 where it is secured. The trip stop I^2 is secured to the end of the rope between the pulley D and pulley block H and is adapted to come into contact with and lift the trip bolt K′, as well as to prevent the pulley blocks H^2 and H^3 from being drawn down against the carrier and injuring them on the carrier.

In the application of the part of the invention shown in Fig. 7 two sheaves L L′ are mounted in rigid bearings in the carrier L^2. A lever L^3 is pivoted at a point between its ends in the carrier frame and at one end projects beyond the end of said frame, where it is provided with a hook L^4 adapted to engage a suitable stop on the track. The inner end of the lever L^3 is provided with a brake shoe L^5 adapted to engage the rope G passing over the pulley L. An arm or yoke L^6 is attached at one end to the lever L^3, its other end being in proper position to permit the passage through it of the rope G. The rope G, after passing over the sheave L, passes under the pulley blocks H^4 and H^5 then over the sheave L′, and its end is then attached to the frame of the pulley block H^5. The stop I^2 is attached to the rope G, in this form of the invention, the same as above described in connection with the preferred form of the invention.

The devices constructed and arranged as above set forth for elevating hay by a suitable sling or forks, and holding it at any desired elevation in a compressed condition are applicable to almost any kind of hay elevator wherein the hay is elevated perpendicularly to a determined height and then drawn in a horizontal direction by the same power that elevates the load.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a tilting frame pivoted in the frame of a carrier, a hoisting rope passed through the tilting frame so as to give it movement back and forth, and a brake shoe or clutch mounted in the carrier frame so as to have movement to and from the rope, said brake shoe or clutch being connected to the tilting frame so that the movement of said frame in one direction will effect the locking of the rope and its movement in the opposite direction will effect the release of the rope, substantially as set forth.

2. In hay elevators, a tilting frame carrying a sheave and a brake shoe or clutch pivotally connected to said tilting frame and adapted to automatically engage a rope passing over the sheave in said frame, substantially as set forth.

3. In hay elevators, a tilting frame carrying sheaves in its upper and lower ends and a brake shoe or clutch pivotally connected to said tilting frame and adapted to automatically engage a rope passing over the sheaves in said frame.

4. In hay elevators, a tilting frame, a rope passed through said frame, and a pivoted brake bar, the free end of which is connected to the tilting frame and carries a brake shoe adapted to engage the rope, substantially as and for the purpose set forth.

5. In hay elevators, an elevated track, a stop on said track to arrest the movement of the carrier thereon, a tilting frame, a rope passed through said frame, and a brake shoe connected to the lower end of said frame and adapted to engage the rope, the upper end of said tilting frame being adapted to engage the stop on the track and release the brake from the rope, substantially as shown and described.

6. In hay elevators, a tilting frame, carrying a sheave for the passage of the hoisting rope, a pivotally supported brake, and a link connecting said brake with said tilting frame, so as to communicate the movement of the tilting frame to the brake and automatically engage the release rope.

7. In hay elevators, the combination with the carrier frame, of a sheave mounted in one end thereof, a tilting frame mounted in the other end of the carrier frame, a sheave in each end of the tilting frame, a pivotally supported brake, a link connecting said brake with the tilting frame, a hoisting rope passing over all of said sheaves, and a stop on said rope to limit the elevation of the load, substantially as set forth.

8. In hay elevators, a track having a stop thereon, a carrier adapted to run on the track and having a pulley in one end thereof, a tilting frame in the other end thereof, a brake shoe pivotally connected with said frame, pulleys mounted in said frame, a latching device in the carrier adapted to engage the stop on the track, compressing pulleys, a rope passing over all of said pulleys and then passed down and connected to the frame of one of the compressing pulleys, and a stop on the rope between the carrier and said compressing pulley, said stop on the rope being adapted to limit the approach of the compressing pulleys to the carrier to ease off the change of movement from vertical to horizontal and to operate the latching device and release the carrier from the stop on the track, substantially as set forth.

9. In hay elevators, a track having a stop thereon, a carrier adapted to run thereon, pulleys mounted in said carrier, a rope passing over said pulleys so as to form a loop, compressing pulleys hung in said loop, and one

end of the rope being connected to the frame of one of the compressing pulleys, a pivoted latch lever carried by the frame of the carrier and adapted to engage the stop on the track, a yoke connected to said latch lever and having a loop at its lower end for the passage of the rope, and an adjustable stop on said rope adapted to strike said yoke and release the latch lever from the stop on the track, said stop being attached to the rope in proximity to the pulley frame to which the rope is connected, substantially as set forth.

10. In hay elevators, sheaves mounted in opposite ends of the carrier, a rope passed over said sheaves so as to form a loop between them, compressing pulleys hung in said loop, one end of the rope being secured to the frame of one of the pulleys hung in the loop, and a stop adjusted upon the rope secured to the pulley frame so as to regulate the approach of the pulleys to the carrier and ease off the change of movement, substantially as set forth.

11. The combination with a track or rail having a stop thereon, a carrier adapted to travel on the track or rail, pulley block, and rope, of a sheave frame pivotally connected to the carrier frame and carrying a sheave and over which the rope passes, said sheave frame adapted to engage the stop on the rail when moved far enough in one direction, substantially as set forth.

12. The combination with a track or rail having a stop thereon, and a carrier adapted to travel on the track or rail, of a lever pivoted to the frame and adapted to engage the stop on the rail or track, a yoke connected with one end of the lever, said yoke having an opening in its free end, a pulley block, a rope secured at one end to the pulley block and having a stop thereon, said rope passed through the opening in the yoke, thence over a sheave in the carrier frame, through the pulley block and finally through the carrier frame, substantially as set forth.

13. In a hay elevator, a rope stop consisting of a plate or disk, having a hole therein for the passage of the hoisting rope, an arm projecting from the plate or disk having holes therein for the passage of the rope and prongs between which the rope is held, substantially as set forth.

14. The combination with a track, a stop on the track and a carrier adapted to run on said track, of an arm or yoke pivoted in said frame, pulleys mounted in said arm or yoke, a brake shoe pivotally connected with said arm or yoke, a locking device on the carrier and adapted to engage the stop on the track, an elevating pulley, a rope passing over all of said pulleys and connected to the frame of the elevating pulley and a stop on the rope between said elevating pulley block and the carrier, said stop being adapted to operate the locking device to release the carrier, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM LOUDEN.

Witnesses:
ARTHUR B. GRAINGER,
JNO. DODDY.