(No Model.) 2 Sheets—Sheet 1.

M. G. GROSSCUP.

HAY, GRAIN, OR FODDER ELEVATOR.

No. 583,468. Patented June 1, 1897.

Fig. 1.

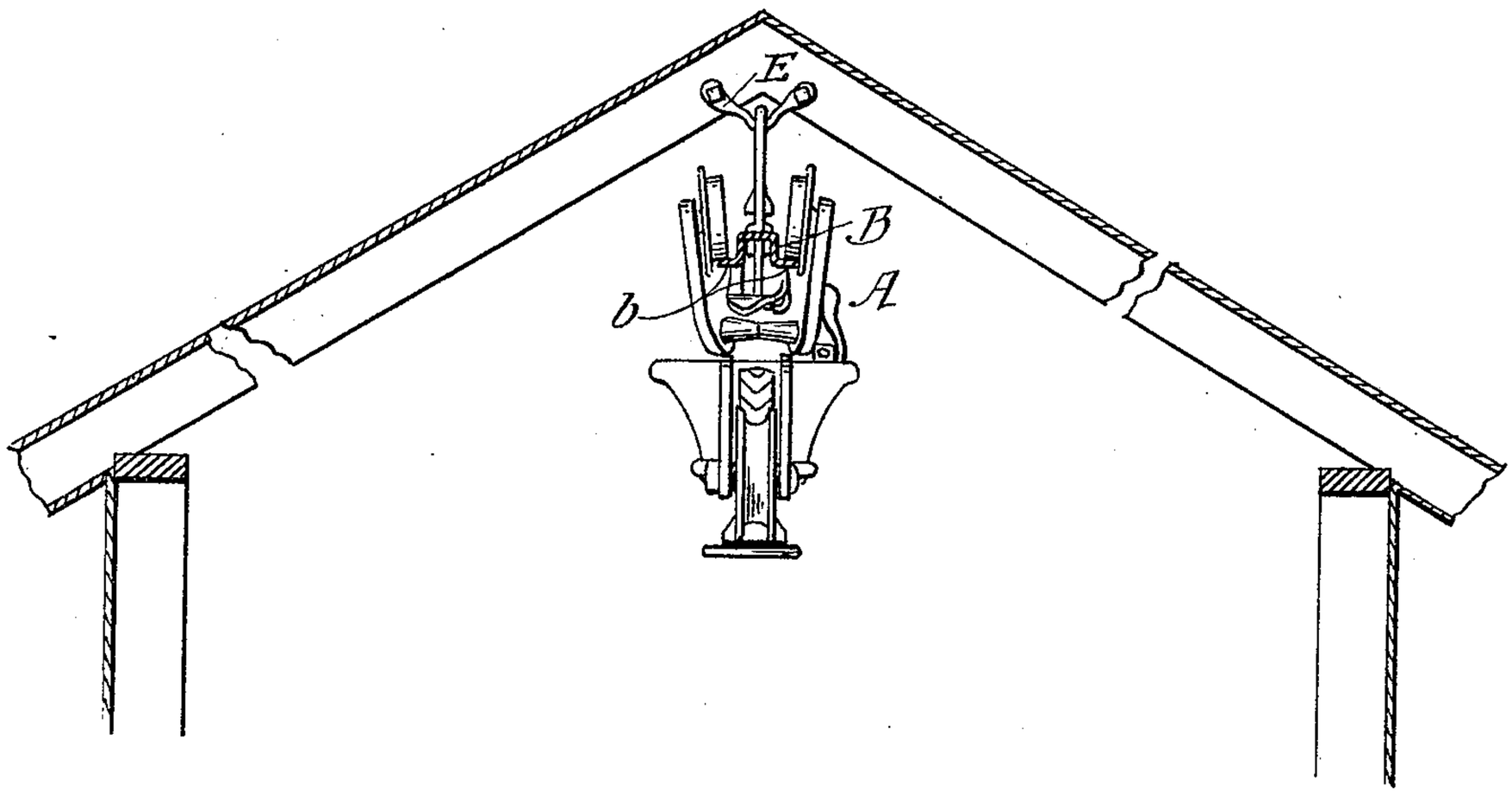
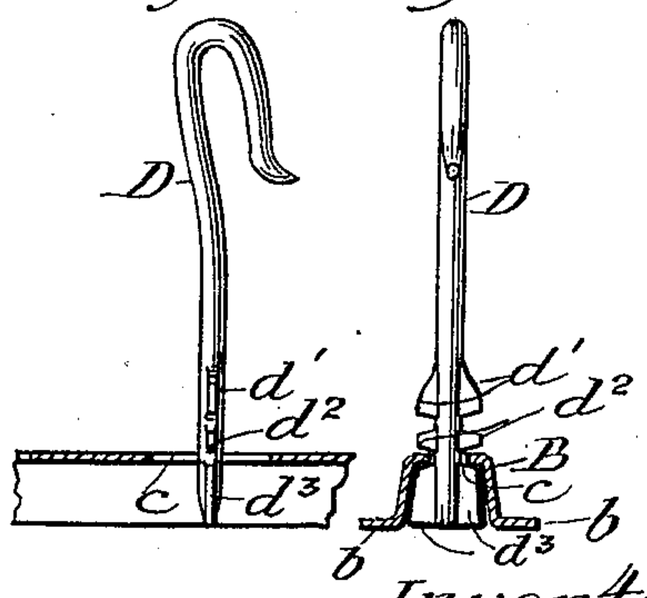


Fig. 2.

Fig. 3. *Fig. 4.*



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(No Model.) 2 Sheets—Sheet 2.

M. G. GROSSCUP.

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Fig. 5.

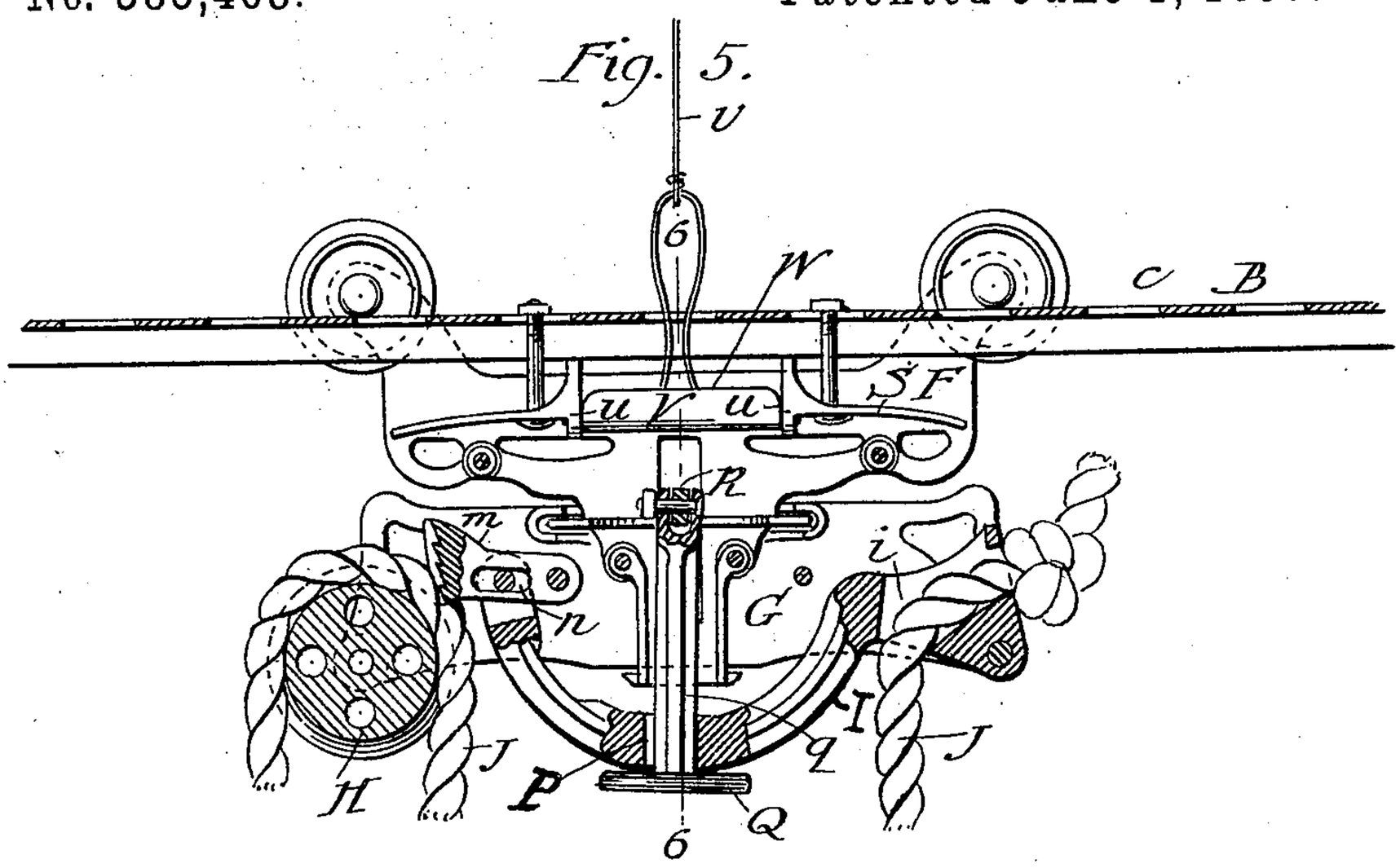
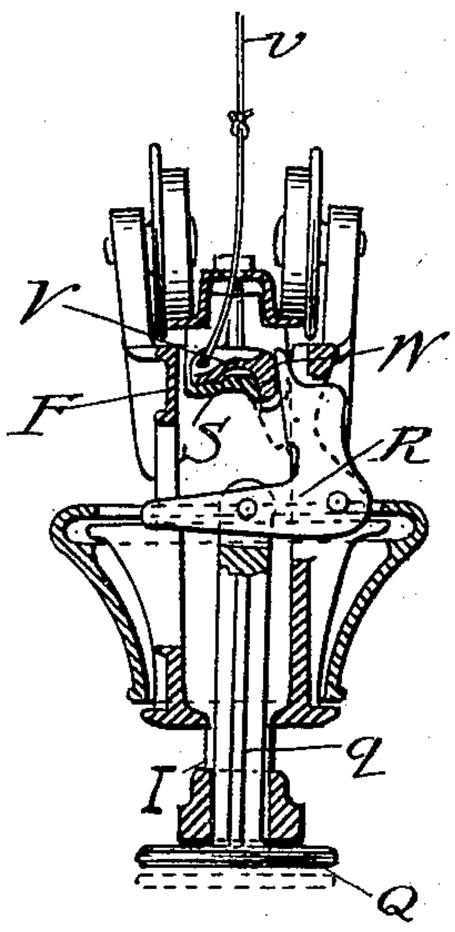
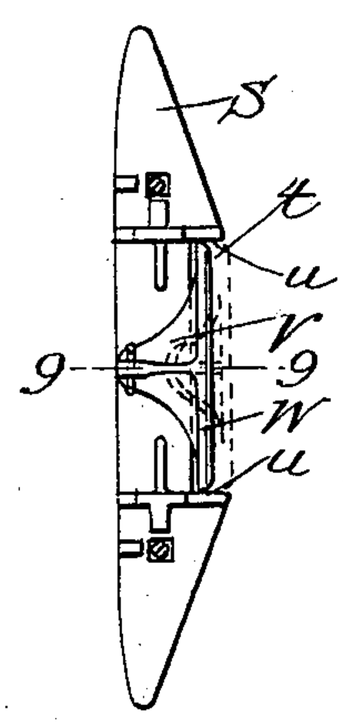


Fig. 6.

Fig. 7.

Fig. 8.





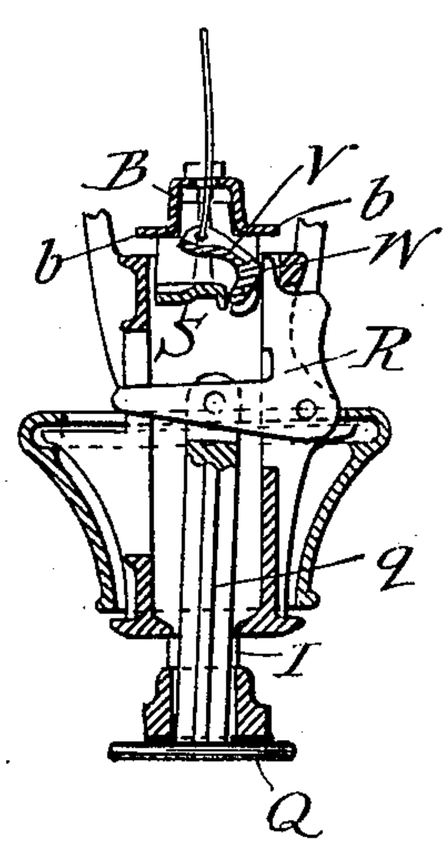
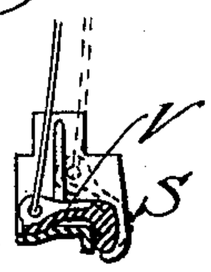


Fig. 9.



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UNITED STATES PATENT OFFICE.

MANIAS G. GROSSCUP, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WHITMAN & BARNES MANUFACTURING COMPANY, OF AKRON, OHIO.

HAY, GRAIN, AND FODDER ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 583,468, dated June 1, 1897.

Application filed August 17, 1896. Serial No. 602,947. (No model.)

To all whom it may concern:

Be it known that I, MANIAS G. GROSSCUP, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented a certain new and useful Improvement in Hay, Grain, and Fodder Elevators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to hay, grain, and fodder elevators of the type popularly known as "hay-carriers," which operate to raise a load vertically and then carry it horizontally. Its object is to provide efficient means for thus raising a load and for allowing the trolley or car to make its horizontal trip with the load held at any desired degree of elevation.

My invention also provides for the automatic release of the trolley whenever the load shall have reached its maximum elevation. The invention also contemplates efficient and economical means for supporting the trolley.

The invention consists in a trolley adapted to travel upon a horizontal or approximately horizontal track in connection with a stop operating to hold the trolley at any point on the track and means for causing the trolley to become disengaged from this stop and for simultaneously gripping the supporting-rope, whereby whenever the trolley is released the load is prevented from descending.

The invention consists also in the parts and combinations of parts hereinafter specified, and definitely pointed out in the claims.

The best embodiment of my invention at present known to me is that shown in the drawings.

Figure 1 is an end view of my improved elevator supported beneath the roof of a barn or other building. Fig. 2 is a side elevation of the same. Figs. 3 and 4 are detail views of the hooks supporting the trolley-track. Fig. 5 is a vertical central section through the elevator. Fig. 6 is a transverse section taken on the line 6 6 of Fig. 5. Fig. 7 is a similar section with the releasing mechanism in a different position. Fig. 8 is a plan of the stop mechanism. Fig. 9 is a transverse section of Fig. 8, taken on a line 9 9 thereof.

Similar letters of reference designate similar parts in each figure.

The trolley A, which carries the load, runs on a track B. This track is preferably made in accordance with Patent No. 523,145, granted to me July 17, 1894, and consists of an inverted channel-bar rather deep and having outwardly-extending flanges *b* at the base of the webs. Through the top of the track are elongated holes *c*. The track is suspended from above by means of the hooks D, which are formed with wings d', d^2, and d^3 on each side thereof. These wings leave notches between them, as shown, and the hook is inserted through the elongated slot and turned through an angle of ninety degrees and then hooked onto a rafter-bracket E. The rafter-bracket prevents the hook from turning, and thus the track is securely held. The lower wings d^3 of the hook brace the track and prevent it being bent inward by the great pressure exerted by the trolley-wheels when a load is being carried. The upper wings d' are formed on the hook so as to provide an adjustment, either the upper or lower notch engaging with the track as the position of the rafter-bracket requires.

The trolley consists of two parts, the upper part F, which for convenience I call the "bogie," and the elevator-beam G, supported thereby and swiveled thereto. The bogie has flanged wheels running upon the track, as shown. The swiveling of the elevator-beam to it is accomplished in any desired manner, that shown in the drawings being very satisfactory. At one of the lower corners of the elevator-beam is journaled the wheel H and at the other corner is pivoted the lever I. Through a hole *i* in this lever passes the elevating-rope J. The rope then passes down, supporting one or more pulleys, (not shown,) and up over the wheel H. The lever I is connected at its other extremity to the dog *m* by means of a pin passing through the slot *n* in such dog. The free end of this dog is serrated or roughened to enable it to grip the rope. The pivot of the dog is so placed with relation to the periphery of the wheel H that the dog may come almost, but never quite, into the line connecting its pivot with the center of said wheel. This short dog has great advantages over a construction where the end of the le-

ver itself grips the rope. The path of travel of the serrated face of the dog being more rapidly divergent from the surface of the rope than in said construction, this serrated face need not be drawn up so far to clear the rope. Also, the movement of the end of the lever I is multiplied before it reaches the serrated face of the dog. The result is that this construction is very sensitive in operation, the dog gripping the rope before it has descended hardly a perceptible amount, while in the older construction the rope was liable to descend many inches, sometimes two feet or more, before being gripped, and accordingly when thus gripped the rope became frayed, the parts strained, and the load jerked. My construction also allows the parts to be made much lighter than would be practicable without a separate dog.

Passing through a hole P in the lever I is the tappet-bar *q*, carrying at its lower end a plate Q. The upper end of this tappet-bar is pivoted to the bell-crank R. It will thus be seen that if the position of the bell-crank is such as to hold the tappet-bar in an elevated position the lever I will also be held in an elevated position by means of the plate Q, and the dog *m* will not engage with the rope J, but if the upper end of the bell-crank R should be released, and thus allow the tappet-bar to descend, the lever I would also descend and the dog come into engagement with the rope. Supported underneath the track, at the point at which the elevating takes place, by bolts passing through two of the slots in said track, is the stop-plate S. This stop-plate has in its edge a recess *t*. When the elevating is being done, the upper end of the bell-crank normally lies within this recess, as shown in Fig. 6, and by engaging with one of the edges *u* of such recess prevents the bogie from moving. The recess is only deep enough to allow the upper end of the bell-crank to get a good hold against an end wall of the recess and does not permit it to swing inward far enough to enable the dog *m* to engage the rope. Pivoted to this stop-plate is the releasing-dog V, to which is attached a cord *v*, running over a pulley to any desired point. If this releasing-dog is elevated, the edge W thereof swings outward into the position shown in dotted lines in Fig. 8, thus forcing the upper end of the bell-crank beyond the edge of the recess, as shown in Fig. 7. If now a pull be given to the bogie, the same will travel along the track and the upper end of the bell-crank will bear against the inclined edge of the stop-plate (under the action of the weight, supported by the other arm of the bell-crank) until the tappet-bar, supported by said bell-crank, has assumed its most depressed condition. This allows the lever I to swing downward under the action of its own gravity and the load partially supported by it. The dog will thus grip the rope and securely hold it in substantially the position it was when the releasing-dog V was operated. It will thus be seen that the bogie may be released with the load at any position by means of the cord *v*. If, however, it is desired to elevate the load to its extreme height before giving a lateral travel to the trolley, the bogie need not be released by hand, but the result will be automatically accomplished by the load (or the pulley supporting it) coming in contact with the plate Q, which, being elevated, carries the upper end of the bell-crank out of the recess and allows the bogie to travel. When the bell-crank has cleared the stop-plate, the dog engages with the rope, as before explained, and the load is held in this elevated position.

After the elevator has been installed the operation in elevating hay, for example, is as follows: A sling or other device holding the hay is hooked onto the pulley or pulleys carried by the elevating-cable. The same is then drawn up by horse-power or in other manner until it is a little higher than the floor on which it is to be stowed. The releasing-dog is then actuated by means of its cord and the trolley travels in the desired direction under a pull supplied in any desired manner. This tendency of the trolley to move along the track may be given by inclining the track, but it is preferably supplied by the supporting-cable itself, which for this purpose should run substantially parallel to the track to the end thereof and then down over a pulley. After the trolley has cleared the stop-plate the cable becomes locked, as heretofore explained, and the load is conveyed to the desired point and discharged. The trolley is then drawn back to its original position by any desired means. As the upper arm of the bell-crank comes in contact with the inclined edge of the stop-plate the same is swung outward, thus raising the lever I and causing the dog to release the cable. The cable is then free to descend and the trolley becomes locked in elevating position by the upper arm of the bell-crank passing into and engaging the recess in the stop-plate. The elevating is continued in this manner until the haymow is nearly filled, when it becomes more convenient to let the load release the trolley automatically by allowing the pulley supporting it to impinge against the plate Q, as explained.

Having thus described my invention, what I claim is—

1. In a hay, grain or fodder elevator, a trolley carrying a lever to which the lifting-cable is attached, an independently-pivoted gripping-dog to which said lever is loosely connected between the pivot and gripping-face of said dog and in proximity to another portion of the lifting-cable which said dog is adapted to engage when actuated by said lever upon its release, and means for releasing said lever, for the purpose specified.

2. In a hay, grain or fodder elevator, in combination, a lever to which the lifting-cable is attached, a separate dog loosely connected

with said lever and adapted to engage another portion of the cable, means for holding said dog out of such engagement and means for allowing it to make such engagement at any desired point or elevation of the cable, for the purpose specified.

3. In a hay, grain or fodder elevator, in combination, a traveling trolley, a lever pivoted therein and carrying one end of the lifting-cable, said lever being connected to an independently-pivoted dog adapted to contact with the lifting-cable, the pivot of said dog being nearer the point of cable contact than is the pivot of said lever, means for holding said lever in an elevated position whereby the dog is out of engagement with the lever, and means for allowing it to descend and thereby cause the dog to engage the cable, for the purpose specified.

4. In a hay, grain or fodder elevator, the combination of the lever I, the wheel H, and the dog *m*, the said dog being connected with said lever and being pivoted at a point nearer the wheel H than is the pivot of said lever, for the purpose specified.

5. In a hay, grain or fodder elevator, a trolley carrying a pivoted lever connected to a dog adapted to engage the elevating-cable and a rod adapted to hold the lever in an elevated position, whereby the dog is out of engagement with the cable, in combination with a stop secured to the track on which the trolley runs, a lever carried by said trolley engaging with said stop and connecting with the said rod, and means for causing said last-mentioned lever to become disengaged from said stop at any desired point of elevation of the load whereby the dog is allowed to grip the cable and hold the load for descending, for the purpose specified.

6. In a hay, grain or fodder elevator, a trolley having means for engaging and locking the elevating-cable and a lever adapted to hold said means out of operation, in combination with a stop-plate supported by the track on which the trolley runs, said stop-plate having a recess in its edge in which said lever is adapted to lie and thereby prevent the trolley from traveling along the track and also prevent the cable from being locked, and means for forcing said lever out of said recess whereby it may be moved clear of said stop-plate and the elevating-cable locked, for the purpose specified.

7. In a hay, grain or fodder elevator, the combination of a track composed of a plate having elongated slots in it and a hook for supporting the same, consisting of a shank having two wings on each side thereof, said upper and lower pairs of wings having a pair of notches between them, for the purpose specified.

8. In a hay, grain or fodder elevator, a supporting-track consisting of an inverted-channel-shaped bar having elongated slots through its upper wall, in combination with a hook consisting of a shank having projecting from it two pairs of wings, one pair being above the other pair and having a pair of notches between them, the members of each pair being substantially diametrically opposite, whereby said hook may be inserted through said slot and then turned substantially ninety degrees, thereby becoming locked thereto and having its lower wings bracing said track against a pressure tending to force the walls thereof inward, for the purpose specified.

9. In a hay, grain or fodder elevator, a hook for supporting a track consisting of a shank having three wings on each side thereof, the upper pair of wings and the middle pair having a pair of notches between them, and the middle and lower pairs of wings having a pair of notches between them, either of said pairs of notches being adapted to coöperate with the track whereby the latter may be supported in a choice of positions, for the purpose specified.

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