







# UNITED STATES PATENT OFFICE.

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## HAY-CARRIER APPARATUS.

No. 808,558.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, WILLIAM LOUDEN, a citizen of the United States, residing at Fairfield, in the county of Jefferson and State of Iowa, have invented a new and useful Improvement in Hay-Carrier Apparatus, of which the following is a specification.

My invention relates to apparatus for operating hay-carriers in round or L-shaped barns where the track has to be made in a circle or curved to pass around obstructions; and it consists of means whereby the rope is made to conform approximately to the curve of the track and the carrier is arranged to run at all points on a circular track without change of pulleys and of other features set forth in this specification and particularly pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a plan of a round barn with a hay-carrier apparatus embodying my invention. Fig. 2 is a perspective of the means to hold the hoisting-rope approximately in conformity with the track where there are no posts within the curve of the track. Fig. 3 is a broken perspective showing the same applied to a post. Fig. 4 is a vertical section of the same. Fig. 5 is a horizontal section on line 5 5 of Fig. 3, the back part of the post being broken away. Figs. 6 and 7 are detail views.

Referring to the drawings, A represents the wall of a round barn in which a circular track B is suspended and upon which a hay-carrier C is mounted. The central portion D may be a silo or such other structure as may be desired, and E is a driveway through which hay or other material may be brought into the barn.

P and P' represent posts in the barn for the support of the roof or for other purposes, and G and G' are rollers mounted upon some of the posts to guide the draft-rope F, which runs from the carrier C to a pulley H at the opposite side of the barn.

I represents a fork to elevate the hay, which is connected to the carrier in the usual manner. Hay being brought into the driveway and the fork inserted therein and power being applied to the free end of the rope J, the hay will be elevated to the carrier and the carrier will be drawn around on the track on the right-hand side of the barn until it reaches the point K on the track, and the hay may be deposited at any point along this part of the track.

It will be seen that the rollers G will hold the rope from rubbing against the central posts P and will also make it conform approximately to the contour of the track, so that the carrier will run thereon instead of being pulled crosswise upon it by the rope.

To operate the carrier on the other side of the barn, it is drawn around by the draft-rope or otherwise to the point K. It is then pulled around on the left-hand side of the track by the trip-cord of the fork, (or otherwise, if desired,) and the hoisting-rope will come in contact with the rollers G' on the central posts P', as indicated by the dotted line X. A swivel-carrier has to be used, or, at least, a reversible carrier, which will operate with either end of the stop on the track, which is attached to the track where the carrier is shown in the drawings, or with another stop affixed to the track adjacent to this one. The carrier will now operate on the left-hand portion of the track the same as it did on the right-hand portion, and by this means the hay may be elevated from the driveway and be deposited at any point in the barn around the circuit of the track without any change whatever except to run the carrier from the point K on the track to one side or to the other. The carrier may be of common construction. The stop or stops may be affixed to the track in the usual way, and the carrier may coact with the stop or stops in the ordinary manner, all of which is well known to the art, and therefore it will be unnecessary to describe these parts in detail.

It is not necessary that the track should be a regular circle. It may be made in the form of an ellipse or a rectangle with gently-rounded corners, so the carrier can be drawn freely around them with the hoisting-rope. The track must be continuous all around from the starting-point over the driveway where the carrier A is stationed, but it is not necessary that the track be continuous over the driveway. It may be separated at this point and the ends may be extended farther out in the driveway, as indicated by the dotted lines L. In this case, however, a track-stop will have to be secured to each end of the track, so as to coact with the carrier on either side.

The means I use to hold the rope approximately in line with the track is illustrated in detail in Figs. 2, 3, 4, 5, 6, and 7. It consists, essentially, of a vertically-disposed roller G, made long enough to catch the sag of the rope when slack and so mounted and supported



that it will catch and guide the rope in proper position whether drawn taut, as in elevating a load, or left slack, as when the empty carrier is being returned. The roller is supported in position by upper and lower castings M and M', and when there are suitable posts in the barn these castings are secured by bolts N and N' to brackets O and O', which are affixed to the posts, preferably as shown in Figs. 3 and 4.

The castings M and M' have openings in their centers, as shown by Q in Fig. 6, which form boxings for the bearings of the roller G. Their ends R and R' are made T-shaped and have holes therein for the admission of the bolts N and N', which are also passed through holes in the brackets O and O', so that the brackets and the castings may be securely held together. The castings M and M' are practically alike except that the casting M is made longer and has a larger opening in its center.

The roller G is preferably fitted with a circular flanged cap S on its upper end, the object of which is to form a guide for the rope when it is drawn taut and to prevent it from getting above the upper end of the roller. This cap is fitted with an annular lip S', which is adapted to fit down over the upper end of the roller and with an upwardly-extending tubular journal S'', which is adapted to fit and turn in the opening Q of the casting M. It is also fitted with one or more small ribs e, which are adapted to cut into the corners of the upper end of the roller and prevent it from turning thereon.

A lag-screw T is inserted in the opening in the journal and is screwed into the end of the roller G, so as to hold the cap securely in place on the end of the roller. A washer u is placed under the head of the lag-screw T, so as to hold the casting and journal together. The lower end of the roller has but little strain upon it, and in this end a lag-screw T', being passed through the central opening in the casting M', is screwed into the center of the end of the roller, so as to form a bearing for this end of the roller.

The casting M has to be made long enough and the brackets O set wide enough apart to take in the cap S, but the lower end of the roller having no cap the casting M' has to be made only long enough and the brackets O' set only wide enough apart to take in the roller. Consequently the bolts N' will not have to be as long as the bolts N.

When there are no posts in the barn upon which the rollers G can be mounted, I construct frames of timbers U and V and connect these frames to the rafters W or to other overhead timbers at the required places in the barn and mount the rollers G and G' upon these frames, as shown in Fig. 2. The casting M will be secured to the timbers U and the casting M' to the timbers V, the same

as they are to the brackets O and O', and the roller will be mounted in these castings, as already explained.

The lower ends of the timbers V should be extended down far enough to catch the slack of the rope and guide it up to the roller, or, if they are in the way, they may be beveled off and a perpendicular timber Y may be secured to their lower ends and be extended down a sufficient distance to catch the slack of the rope and guide it onto the roller, or, if preferred, a hook Z may be pivoted in a slot in the timber Y, so as to catch the rope and hold it from dropping too far down. If by chance the rope should get below the pivoted hook, it would be readily swung upward (as shown by dotted lines) by the contact of the rope below it, so that the rope could readily pass up onto the roller G.

It will be understood that the roller should be long enough to guide the rope while there is any real strain upon it and that it should not come in contact with any of the timbers except when it is slack. Nevertheless, to make it easy on the rope, as well as to make it work the best, the corners of the timbers below the rollers with which the rope is liable to come in contact should be rounded off, and it is better to make the bevels on the lower ends of the brackets O' longer than they are shown in the drawings, so that the rope may slip more easily over them.

In constructing the frame of the timbers U and V the former should be secured to the outer sides of the latter, so as to provide the proper spaces between the timbers for the castings M and M'. Also in mounting the rollers their upper ends should be located about on a level with the horizontal line of the rope from the carrier, or at least not sufficiently below said line to cause the rope when taut to climb over the flange of the cap S. If desired, stops may be placed at other points on the track, so that hay may be elevated at these points, and in case these stops are placed as far along the track toward the pulley H as B on either side of the track then the guide-rollers will not be required. A stop may be placed on each side of the track at B, and the carrier may be operated with the rope F and pulley H from either of these stops without change, except to run the carrier along the track from one stop to the other.

What I claim is—

1. In a hay-carrier apparatus, a curved track, a carrier to run on said track, a rope to operate the carrier, and a pulley for the rope having a location at a distance outside of the line of track and central to it, so that the rope passing over the pulley will operate the carrier in either direction on the track.

2. In a hay-carrier apparatus, a curved track, a carrier to run on the track, a rope to operate the carrier, means to hold the rope approximately in line with the portion of the



track the carrier runs upon, and a pulley located outside of the line of track and central to it, so that the rope in passing over the pulley will operate the carrier in either direction on the track.

3. In a hay-carrier apparatus, a circular track, a carrier to run on the track, a rope to operate the carrier, means on both sides within the circle of the track to hold the rope approximately in line with the portion of the track the carrier runs upon, and a pulley located outside of the track, so that the rope passing over the pulley will operate the carrier at all points on the track.

4. In a hay-carrier apparatus, a circular track, a carrier to run upon the track, a rope to operate the carrier, vertically-disposed rollers mounted on both sides within the circle of the track so as to hold the rope approximately in line with the portion of the track the carrier runs upon, and a pulley located outside of the track, so that the rope passing over the pulley will operate the carrier at all points on the track.

5. In a hay-carrier apparatus, a curved track, a carrier to run on the track, a rope to operate the carrier, and a vertically-disposed roller mounted adjacent to the inner side of the track but independently of it, and adapted to guide the rope within working distance of the track.

6. In a hay-carrier apparatus, a curved track, a carrier to run on the track, a rope to operate the carrier, a vertically-disposed roller to hold the rope approximately in line with the track, and a flanged cap on the upper end of the roller.

7. In a hay-carrier apparatus, a curved track, a carrier to run on the track a rope to operate the carrier, a vertically-disposed roller to hold the rope approximately in line with the track, castings to receive the bearings of the roller and timbers to embrace and support the castings.

8. In a hay-carrier apparatus, a curved track, a carrier to run on the track, a rope to operate the carrier, a vertically-disposed roller to hold the rope approximately in line with the track, a cap on the upper end of the roller, an upwardly-projecting journal on the cap, an upper casting to receive the journal, a lower casting to support the lower end of the roller, and timbers to embrace and support the castings.

9. In a device of the character described, two sets of spaced-apart timbers, upper and lower castings placed between the timbers and a vertically-disposed roller mounted between the castings.

10. In a device of the character described, a vertically-disposed roller, two sets of spaced apart timbers, upper and lower castings hav-

ing T-heads with holes therein to fit between the timbers and support the roller, and bolts to pass through the holes in the T-heads and secure the castings to the timbers.

11. In a device of the character described, a vertically-disposed roller, two sets of timbers depending from an overhead support and braced together below, one set of the timbers having their ends extended down below the brace and the roller being supported between the timbers.

12. In a device of the character described, a vertically-disposed roller, two sets of timbers depending from an overhead support and braced together below, one set of the timbers having their ends extended down below the brace so as to form an angle with the other timbers, and castings to support the roller inserted between the central portion of the short set of timbers and between the downwardly-extended ends of the others.

13. In a device of the character described, two sets of timbers depending from an overhead support and braced together below, the ends of one set of the timbers being extended below the other so as to form an angle, a roller mounted in the angle, and means to prevent a rope from getting below the ends of the downwardly-extended timbers.

14. In a device of the character described, two sets of timbers depending from an overhead support and braced together below, the ends of one set of the timbers being extended below the other so as to form an angle, a roller mounted in the angle, and a downwardly-extending timber connected to the lower ends of said timbers so as to prevent a rope from getting thereunder.

15. In a device of the character described, two sets of timbers depending from an overhead support and braced together below, the ends of one set of the timbers being extended below the other so as to form an angle, a roller mounted in the angle, a downwardly-extending timber connected to the lower ends of said timbers, and a catch on said timber to prevent the rope from dropping below it.

16. In a device of the character described, two sets of timbers depending from an overhead support and braced together below, the ends of one set of the timbers being extended below the other so as to form an angle, a roller mounted in the angle, a downwardly-extending timber connected to the lower ends of said timbers, and a pivoted catch to prevent the rope from dropping below while permitting it to rise above.

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Witnesses:

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