Aug. 8, 1939. G. D. BOOTH 2,168,393

HAY CARRIER

Filed Feb. 12, 1938 2 Sheets-Sheet 1

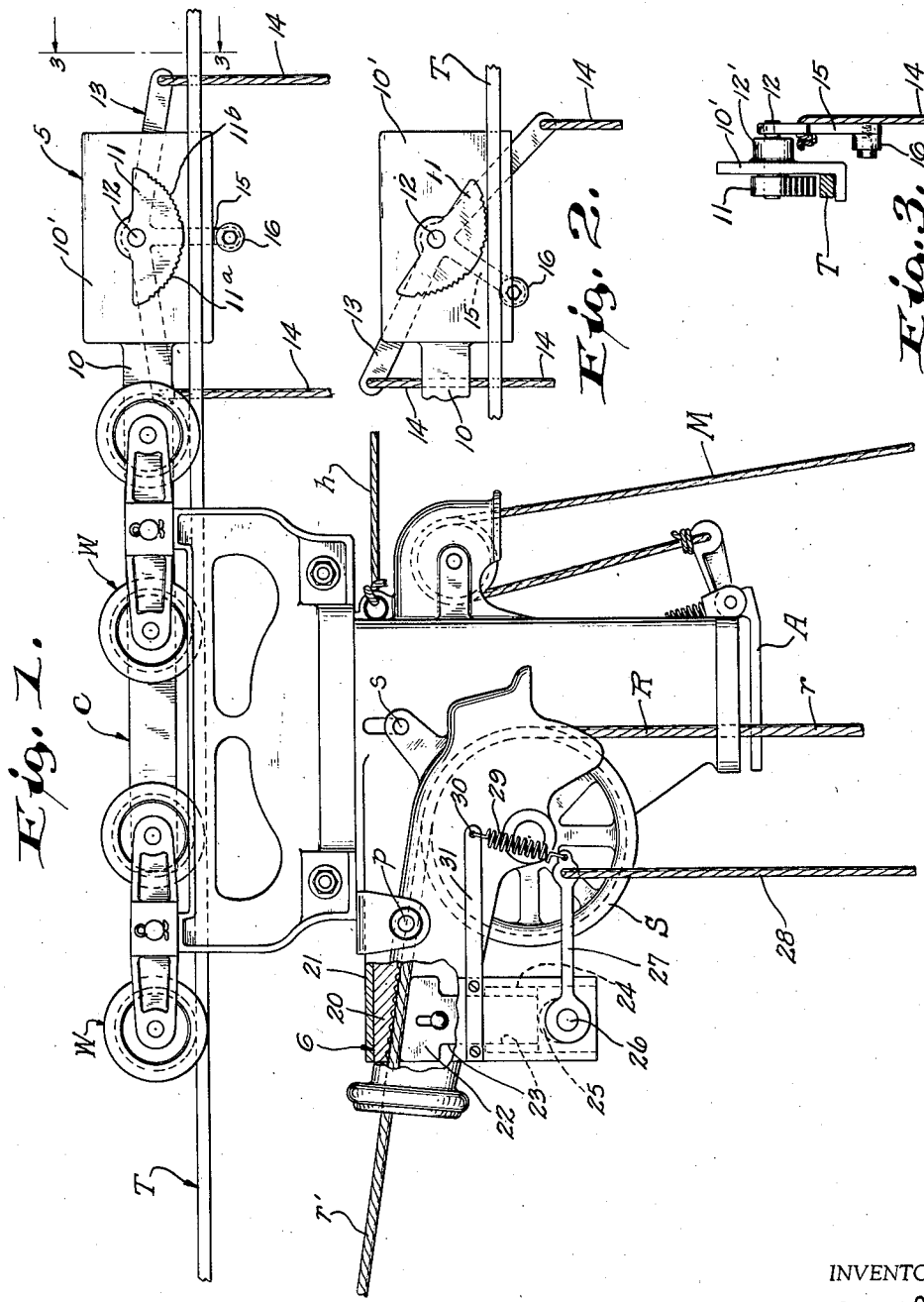


Fig. 1.

Fig. 2.

Fig. 3.

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HAY CARRIER

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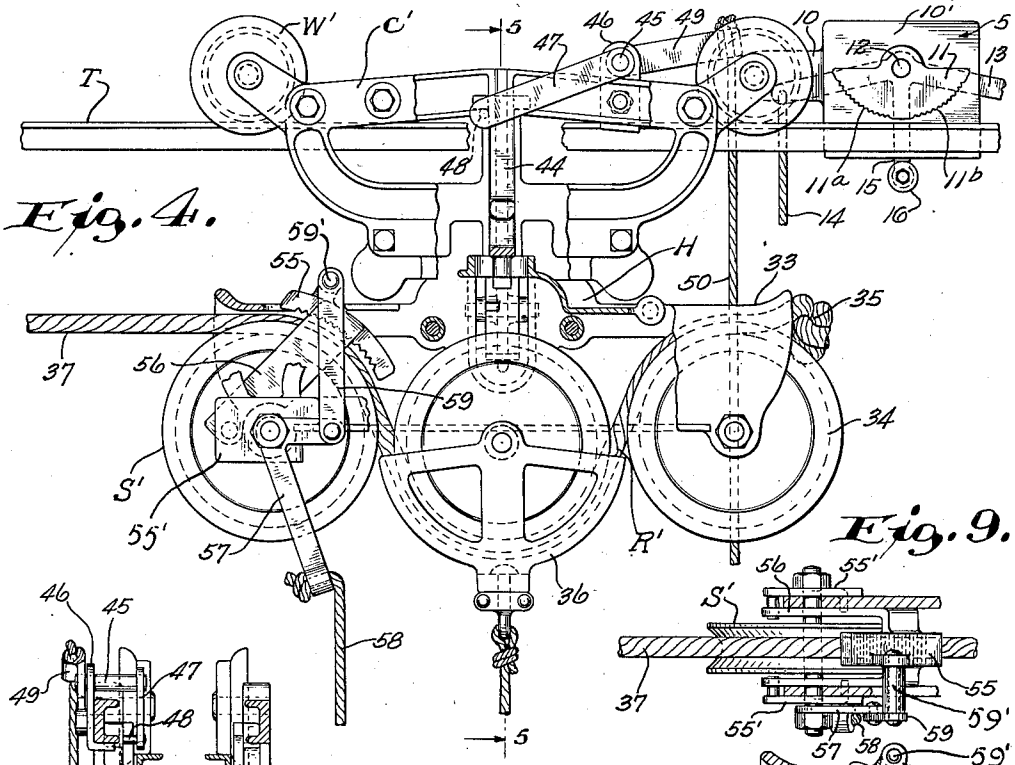


Fig. 4.

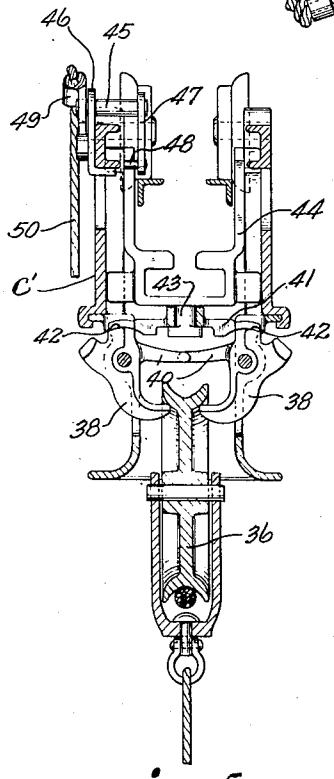


Fig. 5.

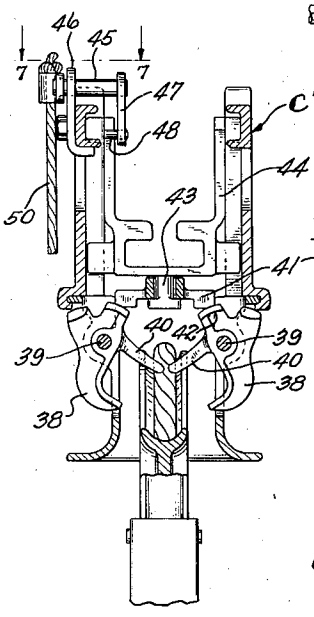


Fig. 6.

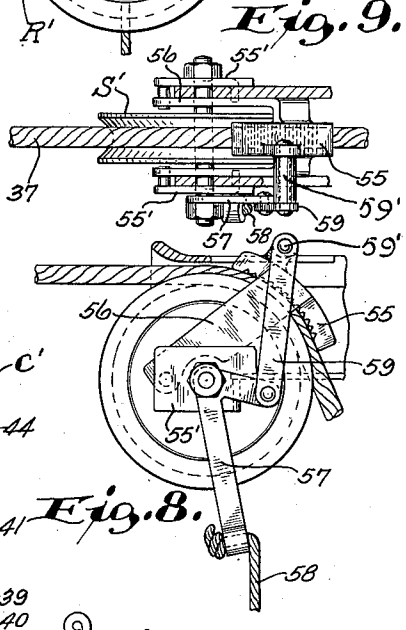


Fig. 8.

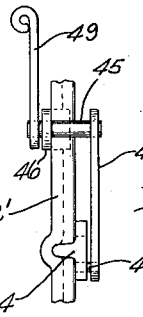


Fig. 7.

Fig. 9.

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Patented Aug. 8, 1939 2,168,393

UNITED STATES PATENT OFFICE

2,168,393

HAY CARRIER

George D. Booth, Marshfield, Wis.

Application February 12, 1938, Serial No. 190,169

8 Claims. (Cl. 212—110)

This invention relates to an improvement in hay carriers usually employed in the barns of farms and of the type having a carriage suspended from and running along an overhead track and a sling or fork suspended from, traveling with, and adapted to be raised and lowered with respect to the carriage.

One of the principal objects of the present invention is to so constitute and control a hay carrier of this character that the hay being handled may be accurately spotted and dumped to avoid the necessity of pitching the hay or rolling it into position thereby materially reducing the amount of labor required and leaving the hay in much better condition for subsequent handling.

In carrying out the present invention means is combined with the carrier for locking it in any position along its track and this means is controllable at will by the operator. Also combined with the carrier is a manually operable brake or lock effective to controllably lower the load in any position of the carrier and this without interfering with the conventional automatic locking or setting of the rope clamp and simultaneous release of the carriage when the load is fully elevated at the loading station, or of the automatic latching of the sheave in its elevated position and simultaneous release of the carriage when the latter expedient is resorted to at the loading station.

Another object of the invention is to provide a hay carrier having these advantages and capacities and which requires a simple and comparatively inexpensive modification of any of the conventional constructions now widely employed.

Other objects and advantages reside in certain novel features of the construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming a part of this specification, and in which:

Figure 1 is a view in side elevation with parts broken away and shown in section and illustrating a hay carrier constructed in accordance with the present invention, the showing of certain conventional parts of the hay carrier being more or less diagrammatic;

Figure 2 is a fragmentary view in section illustrating the locking postion of the brake or locking device for securing the carrier against movement at any point in its travel along its track;

Figure 3 is a sectional view taken on line 3—3 of Figure 1;

Figure 4 is a view partly in side elevation and partly in vertical section showing another type of hay carrier constructed in accordance with the present invention;

Figure 5 is a view in transverse vertical section taken on line 5—5 of Figure 4;

Figure 6 is a fragmentary view similar to Figure 5 but showing the supporting or locking hooks for the sheave in released position;

Figure 7 is a fragmentary view of the manually operable means for releasing the sheave supporting hooks as viewed from line 7—7 of Figure 6;

Figure 8 is a fragmentary view in side elevation illustrating the rope clamp or lock in locked position; and

Figure 9 is a plan view of the parts illustrated in Figure 8, certain of the elements being broken away and shown in horizontal section for the sake of illustration.

Referring to the drawings and more particularly to Figures 1 to 3, it will be seen that the hay carrier there illustrated is the type known as the "Myers adjustable sure-lock sling" manufactured by F. H. Myers & Bro. Co. of Ashland, Ohio, and comprises, in the main, a carriage designated generally at C and equipped with wheels W which roll along an overhead track T. The power rope is designated at R and is reeved over a sheave S in the usual manner. The portion *r* of the rope R extends downwardly to support the sheaves for the sling or fork in the usual way whereas the end *r'* of the rope extends over suitable guide pulleys (not shown) and is hitched up in any suitable way to the horse or horses. The frame or shroud for the sheave S is pivotally supported on the carrier as indicated at *p* and its swinging or pivotal motion is limited by a pin and slot arrangement *s*. Devices of this character are usually equipped with a rope lock which automatically clamps the load against lowering when it has been elevated to the desired extent and power is no longer applied to the end *r'* of the cable or rope R to elevate the load. Usually also they have an automatic trip designated generally at A and designed to be tripped by the sling pulley to release the automatic lock conventionally employed between the carrier and the track T at the loading station and releasably securing the carrier against motion while at the loading station. The

trip A also usually controls the conventional rope clamp referred to. A manually operable means M is combined with this trip A to provide for releasing of the carriage for travel with the load in any elevation of the sling or fork. A return line *h* is also provided. As thus far described the construction is conventional, well known, and is widely used.

Generally speaking, the present invention proposes to equip the carriage with a manually operated brake or lock designated generally at **5** and is effective to releasably secure the carriage to its track at any point in the travel thereon and also to provide a special type of rope lock or clamp designated generally at **6** and which may be manually controlled at the will of the operator as well as automatically controlled as before.

In the construction shown in Figure 1 the bar **10** is rigidly interconnected with the carriage **6** in any suitable way and projects beyond one end of the carriage. The projecting end of the bar **10** is provided with an enlargement **10'** which is of L-shape in cross section and extends around the track T in the manner clearly shown in Figure 3. A locking cam or shoe **11** is pivotally mounted on the end **10'** of the arm **10** by means of a short shaft **12** rotatably supported in a bearing **12'** provided therefor in the plate **10'**. The cam is fixed to one end of the short shaft **12** whereas the other end thereof is secured to the hub or central part of a double arm lever **13**. Pull ropes **14** are secured to the ends of the double arm lever **13**. Means is provided for biasing the cam **11** to its inoperative position wherein it is disengaged and spaced from the track T and this means may consist of an arm **15** fixed to the lever **13** and depending therefrom and having a weight **16** at its lower end. The influence of this weighted arm is to maintain the cam **11** in the position shown in Figure 1. Obviously springs may be substituted for this weight bias.

The cam **11** has two active faces **11***a* and **11***b* both of which are toothed and so sloped or curved as to be self-locking. By having the two faces constructed in the manner shown the device is operable to secure the carriage against travel in either direction merely by pulling upon the appropriate pull rope **14**. For example, when the right hand pull rope is drawn downwardly the cam is shifted to the locking position shown in Figure 2.

The rope clamp or lock **6** includes a fixed jaw **20** suitably fastened to a stationary part **21** of the carrier and extending through an opening in the top of the frame or shroud of the sheave S and in position to operatively engage the ends *r'* of the rope or cable R. Cooperable with the fixed clamp **21** is a movable clamp **22** having a shank **23** vertically disposed and slidably fitted in a vertical guideway **24** provided therefor on the frame for the sheave S. The lower end of the shank **23** rides on a cam or eccentric **25** disposed in the lower end of the guideway and fixed to an intermediate portion of its control shaft **26**. The shaft **26** is rotatably mounted in and projects at its ends beyond suitable bearings provided therefor in the guideway **24**. A rock arm **27** is fixed to one end of the shaft **26**. A pull cord **28** is suitably fastened to the outer end of the rock arm **26** and extends downwardly to within reach of the operator. The movable clamp **22** is normally biased to a position wherein it is adapted for clamping engagement with the rope by means of a retractable coil spring **29** having one end attached to the outer end of the rock arm **26** and having its other end anchored as at **30** to a suitable bracket **31** fixedly secured to the guideway structure **24**.

In the use of a hay carrier of the character described the carrier is releasably secured in position at the loading station in the usual manner and at such time the locking cam **11** is released. When the sling (or fork) has been pulled up to fully elevated position the sling sheave strikes the trip plate A to release the lock between the carrier and the track in the well known manner and to cause the rope clamp **6** to automatically clamp the rope R to maintain the load elevated. The carrier is then shifted along its track T to a position overlying or in appropriate relation to the point of deposit of the hay. The operator then pulls on one of the ropes **14** to swing the cam **11** into interlocking engagement with the track and secure the carrier against movement with respect to its track. The rope **28** may then be pulled to allow the jaw or clamp **22** to move downwardly thereby releasing the rope R and allowing the load to descend. The descent of the load can be controlled under the snubbing action of the jaw **22** by intermittent operation of the rope **28** or the load may be lowered under the control of the horse power exerted on the end *r'* of the rope R with the jaw **22** maintained, under the control of the operator, in inoperative position. Obviously the control that is thus had over the spotting and over its lowering makes it possible to place the hay exactly where desired and this without dropping it at any considerable distance. Since the carriage is locked in position the sling when lowered may be pushed manually in any direction without shifting the carriage thereby giving further control over the place in which the hay is deposited.

The type of hay carrier shown in Figures 4 to 9 inclusive has a carriage designated generally at C' supported by wheels W' on track T' and from which a reversible head H is suspended. These features of the carrier are in general similar to the construction disclosed in the Ferris Patent 1,207,285 granted December 5, 1936, but in the manner in which the load is suspended and controlled and the way in which the carriage is releasably locked to the track it is varied from the disclosure of the patent referred to although this construction also is conventional except in so far as it is indicated otherwise.

In the construction shown the power rope is designated at R' and has one end dead ended as at **35** by knotting the end of the rope and causing it to wedge between the sheave **35** and its guide or shroud **33**. The rope R' is also reeved over a power sheave S'. In the bight of the rope between the sheaves a load supporting sheave **36** is suspended. The end **37** of the rope R extends over suitable guide pulleys to the horse power as before.

With this arrangement when the sheave **36** is fully elevated it is releasably secured in its elevated position by means of a pair of hooks **38** pivotally supported on the head H as indicated at **39**. The hooks **38** are so constructed that they tend to hang in the position shown in Figure 6 wherein their fingers **40** lie in the path of the flanges of the sheave **36**. As the sheave approaches to fully elevated position it engages these fingers **40** so as to swing the hooks to the position shown in Figure 5 wherein they engage under the flanges

of the sheave 36. They are automatically and releasably locked in this position by means of a locking plate 41 which rides on cam surfaces 42 of the hooks and drops into locking position when the hooks are engaged with the sling sheave. The locking plate 41 is swiveled as at 43 to the lower end of a vertical slide 44 which is also effective to releasably secure the carriage to its track in its elevated position at the loading station. The slide 44 is slidably fitted in a guideway provided therefor on the carriage and is biased to its lowermost position by its weight.

With hay carriers of this type as heretofore constructed and used, the carriage C' is locked to the track at its loading station and the hooks 38 are in their inoperative or released position (Figure 6). When the load is fully elevated the sheave 36 acting on the fingers 40 throws the hooks 38 to sheave engaging position (Figure 5) so that the hooks support the load and they simultaneously shift the lock from its previously locked to a released position, that is, they free the carriage for movement along its track. The carriage is then transferred along the track to the point of deposit and the sling or fork manipulated to release the load. The carriage is returned to the loading station where it is again locked to the track and the hooks disengaged from the sheaves to release them for loading.

Generally speaking my invention proposes to combine with the carriage means for releasably securing it to the track at any point in its travel thereon, means to release the sheave supporting hooks at any time under the control of the operator and means controllable at will for locking the power rope or cable to the power sheave so that the load can be controlled in any position of the carriage as to its lowering or as to its vertical position.

The means for releasably securing the carriage C' in any position along its track is in principle the same as that described and disclosed in connection with the previous embodiment of the invention and as before comprises the locking cam 11 rotatably supported on the carriage or on a part fixed thereto and engaged with the track under the control of pull cords. This is shown in the right hand side of Figure 4. Obviously if desired this locking means may be positioned within the confines of the carriage frame.

The means for controlling the release of the hooks consists of a shaft 45 rotatably supported in a suitable bearing 46 provided therefor in the carriage C' and projected at its end beyond its bearing. A crank arm 47 is fixed to one end of the crank shaft and is provided at its outer end with a pin 48 engageable under one of the T-shaped heads of one of the side members of the slide 44. The other end of this shaft 45 is provided with a control arm 49 to which a pull rope 50 is attached. By pulling on the control rope 50 the shaft 45 is rotated and the crank arm 47 and its pin 48 elevate the slide 42 to release the hooks.

In order to enable the operator to have control over the lowering of the load supporting or sling sheave, a rope clamp or brake is combined with the power sheave and as illustrated it consists of a curved jaw or shoe 55 which may be toothed and which is swingably or pivotally mounted with respect to the rope and power sheave by means of a yoke 56, the shoe or jaw 55 being fixed to the outer end of the yoke and the inner end of the yoke being pivotally supported on brackets 55' fixedly supported on the mounting for the power sheave (see Figures 4, 8 and 9). The position of the jaw or shoe 55 is controlled by means of a bell crank lever 57 fulcrumed on the axis of the power sheave and having one arm connected to a pull rope 58 and its other arm pivotally connected to one end of a link 59, the other end of the link 59 having an offset pivotal connection 59' with the yoke 56. The inoperative position of the rope clamp is shown in Figure 4. By pulling on the rope 58 the clamp may be shifted to the position shown in Figure 8 wherein it is effective to suspend the load even when the hooks 40 are released.

While I have shown and described several embodiments of the invention and have illustrated the invention as applied to two types of hay carriers it is to be understood that these specific constructions have been selected merely for the purpose of illustration and example, that the invention is applicable to any of the various types of hay carriers, and that variations generally in size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

The invention claimed is:

1. A hay carrier of the character described comprising a carriage adapted to run upon a supporting track, cable means suspended from said carriage and including a live sheave rotatably supported on the carriage, a cable reeved about the live sheave and connected with a source of power, and load supporting means raised and lowered by the cable means and effective to cause the load to travel with the carriage, locking means for securing the carriage against movement relative to its track at the loading station, clamping means for preventing movement of the cable relative to the live sheave, said locking means being released and said clamping means being rendered effective when said load supporting means is fully elevated, manually operable means carried by the carriage and cooperable with the track for positively locking the carriage against relative movement in either direction with respect to the track at any point of its travel therealong, and means controllable at will for effecting release of the clamping means at any time.

2. A hay carrier of the character described comprising a carriage adapted to run upon a supporting track, cable means suspended from said carriage and including a live sheave rotatably supported on the carriage, a cable reeved about the live sheave and connected with a source of power, and load supporting means raised and lowered by the cable means and effective to cause the load to travel with the carriage, a clamp carried by the carriage and cooperable with the cable and effective to secure the same against movement with respect to the live sheave, manually operable means carried by the carriage and cooperable with the track for positively locking the carriage against relative movement in either direction with respect to the track at any point of its travel therealong, and means controllable at will for effecting release of the clamp at any time.

3. A hay carrier of the character described comprising a carriage adapted to run upon a supporting track, cable means suspended from said carriage and including a live sheave rotatably supported upon the carriage, a cable reeved about the sheave and connected with a

source of power, and load supporting means raised and lowered by the cable means and effective to cause the load to travel with the carriage, a clamp carried by the carriage and cooperable with the cable and adapted to be applied and released at will, and means carried by the carriage and cooperable with the track for securing the carriage against movement relative to the track at any point of its travel therealong, and including a pivotally supported locking cam having cam surfaces adapted to have locking engagement with the track, means for biasing the cam to inoperative position and means for rocking the cam into engagement with the track.

4. A hay carrier of the character described comprising a carriage adapted to run upon a supporting track, cable means suspended from said carriage and including a live sheave rotatably supported upon the carriage, a cable reeved about the sheave and connected with a source of power, and load supporting means raised and lowered by the cable means and effective to cause the load to travel with the carriage, means carried by the carriage and cooperable with the track for releasably securing the carriage against movement in either direction with respect to the track at any point of its travel therealong, and a clamp carried by the carriage and cooperable with the cable and having a fixed jaw and a shiftable jaw and a manually operable cam device controlling the position of the shiftable jaw at will.

5. A hay carrier of the character described comprising a carriage adapted to run upon a supporting track, cable means suspended from said carriage and including a live sheave, means for supporting said live sheave on the carriage for rotation about its own axis and for bodily swinging movement with respect thereto, a cable reeved about the sheave and connected with a source of power, and load supporting means raised and lowered by the cable means and effective to cause the load to travel with the carriage, a clamp including a fixed jaw secured to the carriage, a movable jaw in cooperative relation to the fixed jaw and supported upon the sheave for swinging movement therewith and for shiftable movement with respect thereto, said load supporting means being effective in its fully raised position to swing said sheave and said movable jaw and cause said cable to be clamped between it and said fixed jaw automatically, and manually operable means for shifting said shiftable jaw to released position independently of the position of said sheath.

6. A hay carrier of the character described comprising a carriage adapted to run upon a supporting track, cable means suspended from said carriage and including a live sheave rotatably supported upon the carriage, a cable reeved about the sheave and connected with a source of power, and load supporting means raised and lowered by the cable means and effective to cause the load to travel with the carriage, means carried by the carriage and cooperable with the track for releasably securing the carriage against movement with respect to the track at any point of its travel therealong, and a clamp carried by the carriage and cooperable with the cable and having a fixed jaw, a shiftable jaw, means biased to a position to maintain the shiftable jaw positioned to engage the cable, and manually operable means for retracting said shiftable jaw.

7. A hay carrier of the character described comprising a carriage adapted to run upon a supporting track, cable means suspended from said carriage and including a live sheave, a frame in which the live sheave is rotatably supported, means for supporting said frame for limited swinging movement on the carriage, a cable reeved about the sheave and connected with a source of power, and load supporting means raised and lowered by the cable means and effective to cause the load to travel with the carriage, a clamp including a fixed jaw secured to the carriage, a movable jaw having a shank, said frame having a guideway in which said shank is slidably fitted, a rotatable cam mounted on the guideway and cooperable with the shank to control the position of the movable jaw, means cooperating with the cam to control its position manually, said load supporting means being effective in its fully raised position to swing the frame and cause the movable jaw when it is in its projected position to co-act with the fixed jaw and clamp the cable against movement relative to the sheave.

8. A hay carrier of the character described comprising a carriage adapted to run upon a supporting track, cable means suspended from the carriage and including a live sheave rotatably supported upon the carriage, a cable dead ended on the carriage and reeved about the live sheave and connected with a source of power, a sling sheave suspended in the bight of said cable, hook means carried by the carriage and cooperating with the sling sheave to support it when it is in its fully elevated position, locking means for securing the carriage against movement relative to its track at the loading station, said locking means being released when said sling sheave is engaged by said hook means, a locking cam carried by the carriage and engageable with the track to lock the carriage against movement in either direction relative to the track at any point in its travel thereon, a manual control for said locking cam, a cable clamp cooperable with the live sheave for securing the cable against movement, and manually operable means for controlling said cable clamp.

GEORGE D. BOOTH.

CERTIFICATE OF CORRECTION.

Patent No. 2,168,393. August 8, 1939.

GEORGE D. BOOTH.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, line 15-16, after the word and period "handling." insert the following sentence -

> The carrier also enables the farmer to take the hay from a mow and load it onto a wagon.;

page 2, second column, line 48, for "December 5, 1936" read December 5, 1916; page 3, first column, line 70, after "toothed" insert the words or ribbed; and second column, line 14, after "released." insert the following -

> The rope clamp 55 is so designed, proportioned and dimensioned that it will automatically hold the load suspended any time the team stops pulling. By virtue of this feature it is not necessary to raise the load to its fully elevated position and thereby cause it to unlock the carrier from the track at the loading station. Unlocking of the carrier may be effected by pulling on the rope 50 in any elevation of the load which, as indicated, is held suspended automatically any time the team stops pulling. This frequently effects quite a saving in the time that otherwise would be required to raise the load all the way up to the carrier and to effect automatic unlocking thereof.;

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 19th day of September, A. D. 1939.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.