

(No Model.)

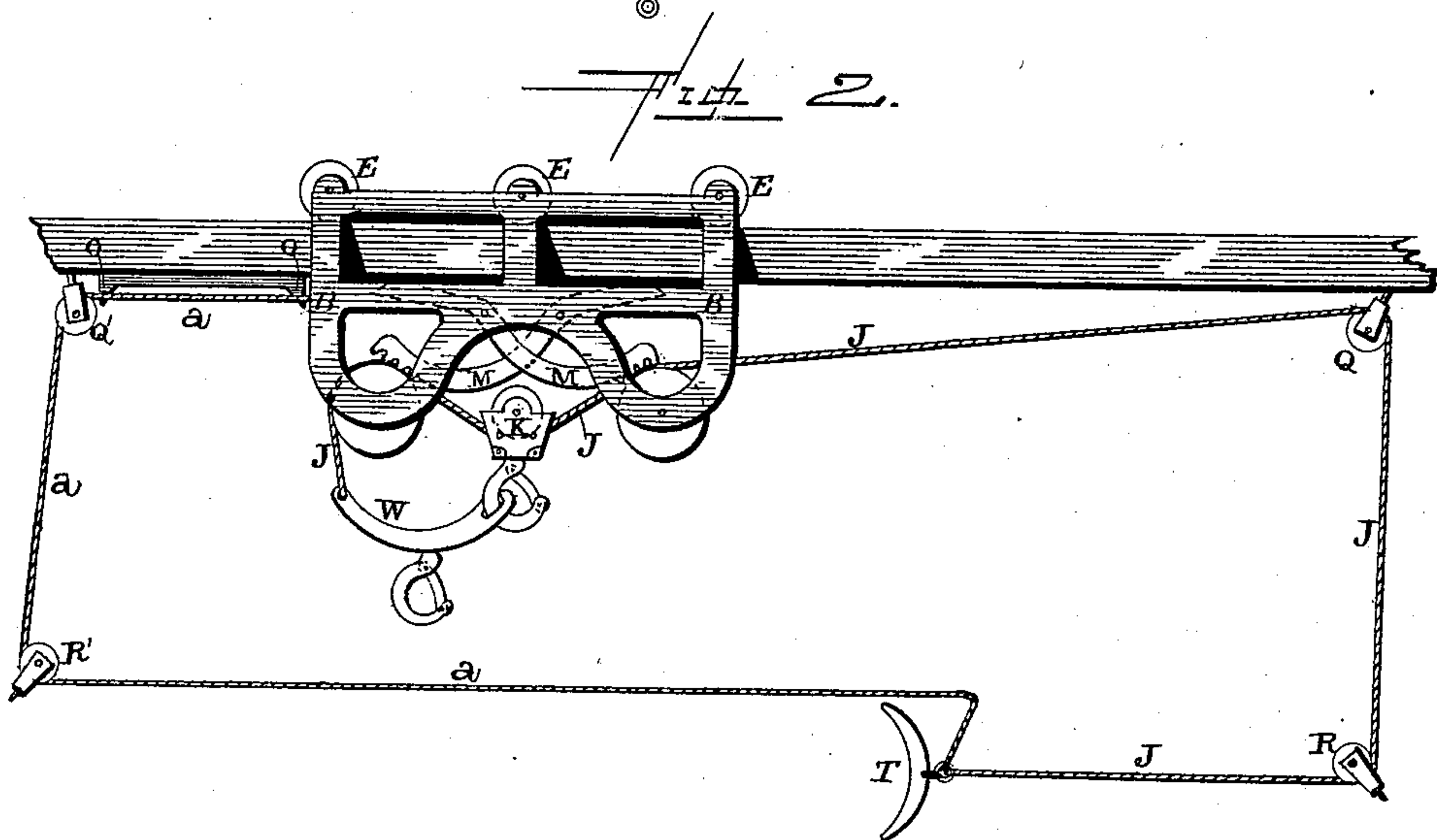
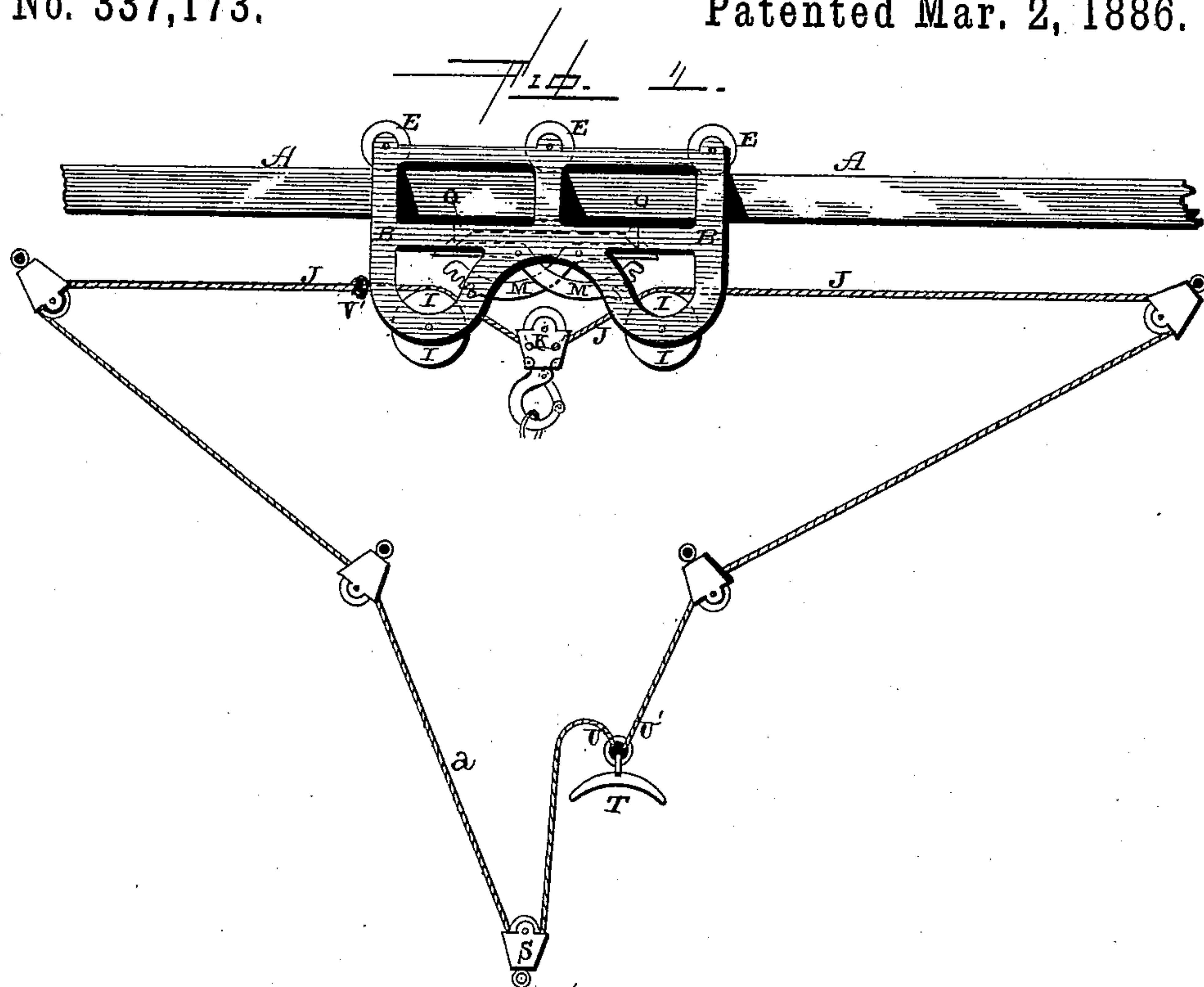
3 Sheets—Sheet 1.

W. LOUDEN.

HAY CARRIER.

No. 337,173.

Patented Mar. 2, 1886.



—WITNESSES.—

R. T. Gardner  
A. S. Pattison

—INVENTOR.—

Wm. Louden,  
per J. A. Lehmann,  
Atty.

(No Model.)

3 Sheets—Sheet 2.

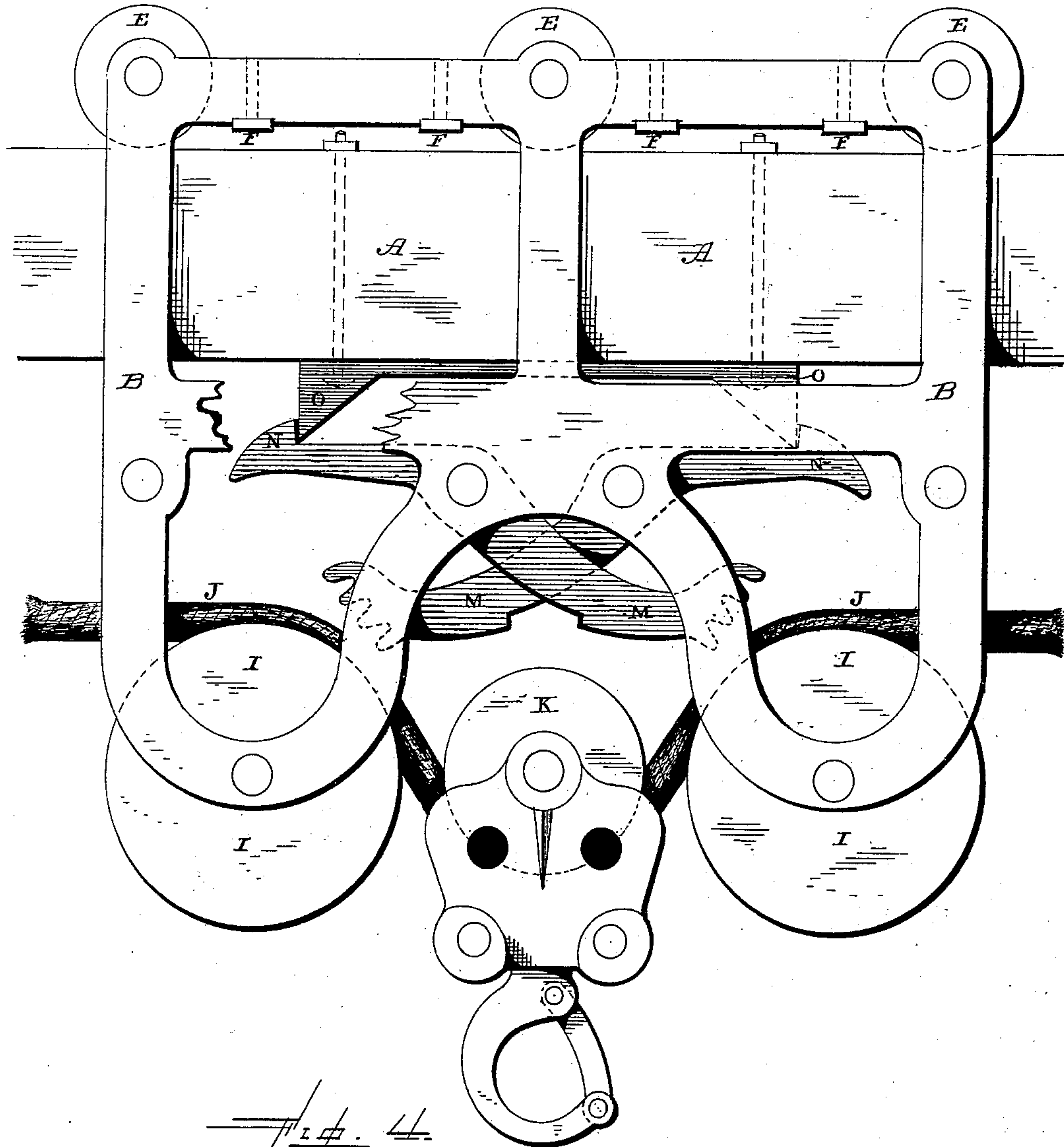
W. LOUDEN.

HAY CARRIER.

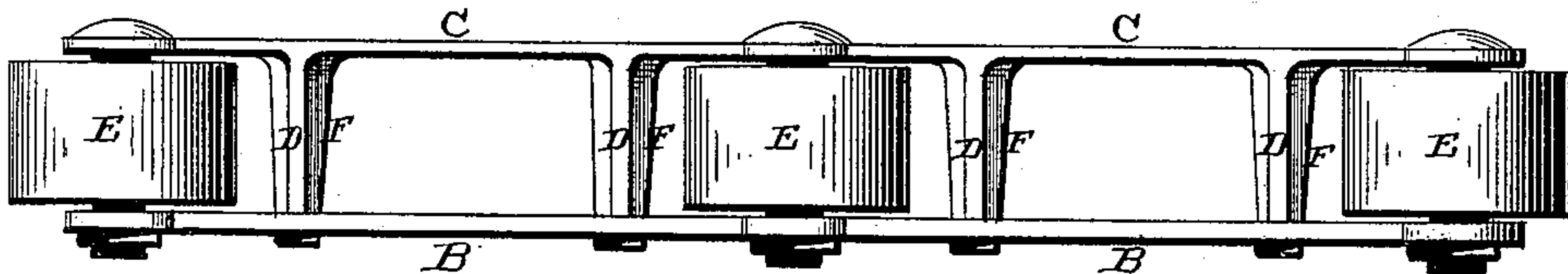
No. 337,173.

Patented Mar. 2, 1886.

*Fig. 3.*



*Fig. 4.*



WITNESSES.

*R. J. Gardner*  
*A. S. Pattison*

INVENTOR

*Wm. Louden,*  
*per J. A. Lehmann,*  
*att'y.*

(No Model.)

W. LOUDEN.

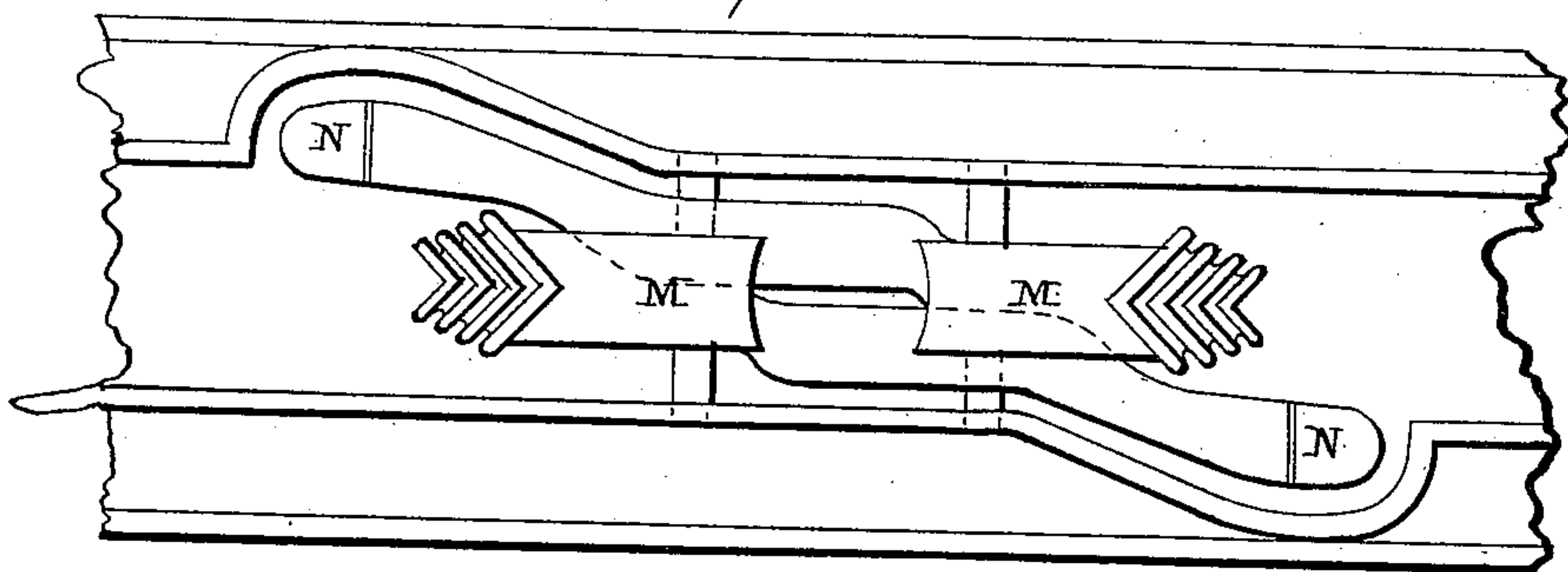
3 Sheets—Sheet 3.

HAY CARRIER.

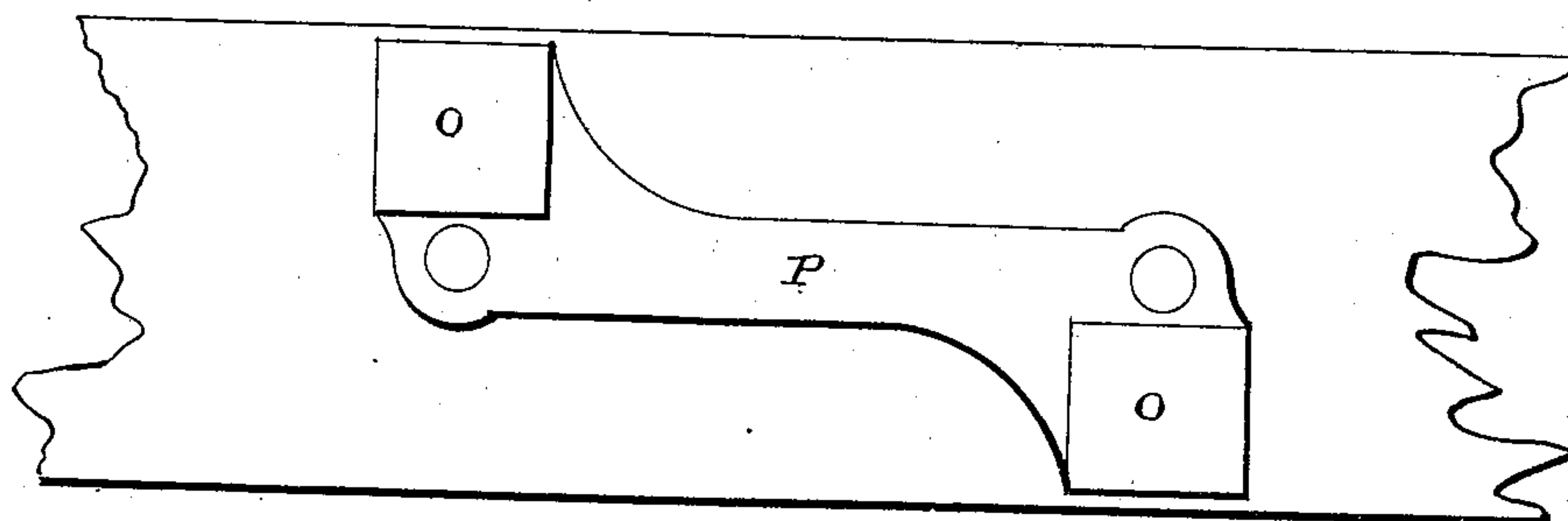
No. 337,173.

Patented Mar. 2, 1886.

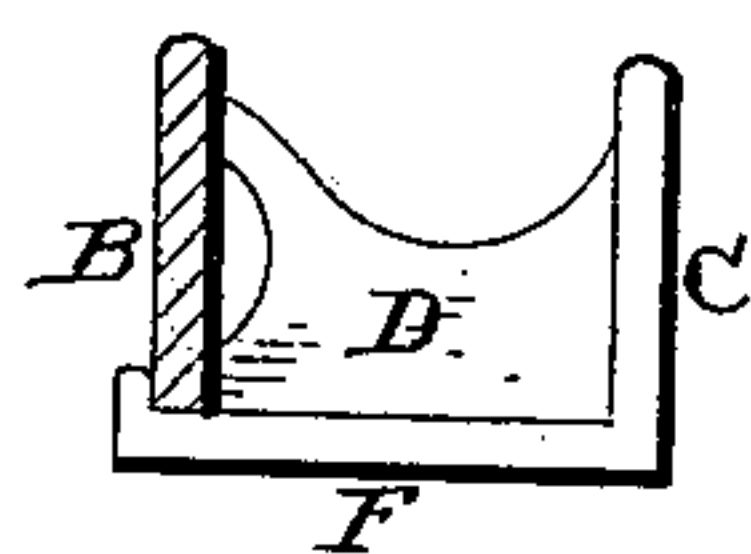
*Fig. 5.*



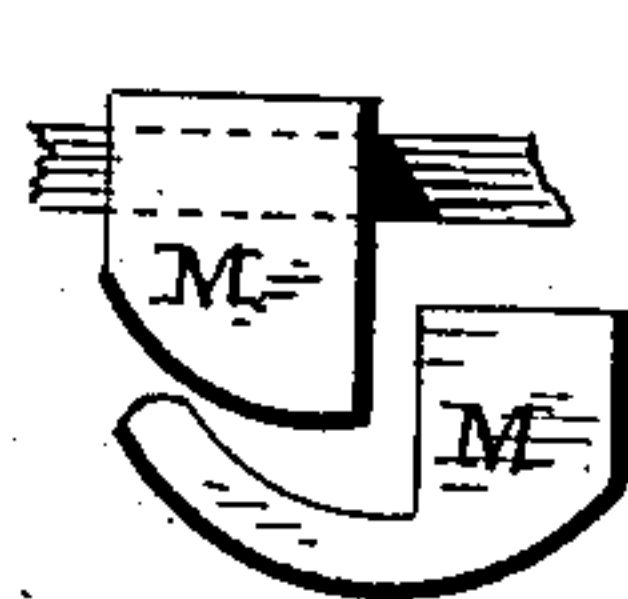
*Fig. 6.*



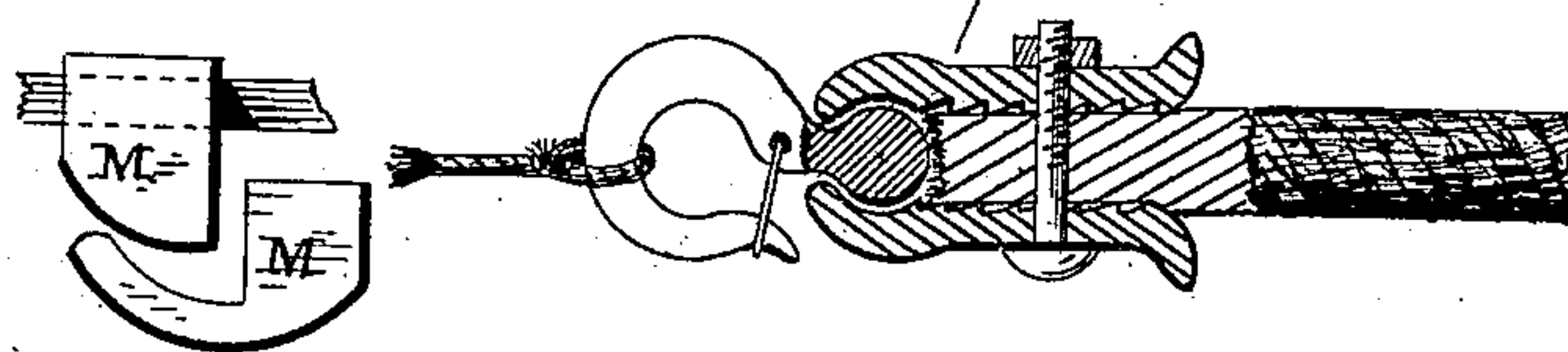
*Fig. 7.*



*Fig. 8.*



*Fig. 9.*



-WITNESSES.-

*A. F. Gardner*  
*A. S. Pattison*

-INVENTOR.-

*Wm. Loudon,*  
*per J. A. Lehmann,*  
*Atty.*



# UNITED STATES PATENT OFFICE.

WILLIAM LOUDEN, OF FAIRFIELD, IOWA.

## HAY-CARRIER.

SPECIFICATION forming part of Letters Patent No. 337,173, dated March 2, 1886.

Application filed December 16, 1885. Serial No. 185,792. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM LOUDEN, of Fairfield, in the county of Jefferson and State of Iowa, have invented certain new and useful  
5 Improvements in Hay-Carriers; 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 pertains to make and use it, reference being had to  
10 the accompanying drawings, which form part of this specification.

My invention relates to an improvement in hay-carriers; and it consists in the combination of an elevated track or railway, a suitable  
15 carriage for moving thereon, one or two operating-ropes to which the draft-animal is attached, and suitable guiding-pulleys located so as to conduct the operating-ropes from the carriage in opposite directions, and to return  
20 them substantially in a circuit to a common point adjacent to the side of the track, for attachment to the draft-animal, whereby the movement of the draft-animal in one direction will elevate the load and draw the carriage  
25 along the track, and the movement of the draft-animal in the opposite direction will return the carriage to the starting-point.

It further consists of improvements in the construction and combination of parts, where-  
30 by double pawl-levers will simultaneously engage the operating-rope and hold it clamped in opposite directions and be simultaneously released therefrom, so that the carriage will operate in either direction on the track, and  
35 be reversed to operate in different directions by simply drawing a continuous rope through the carriage and pulleys in different directions, and attaching the hoisting single-tree to it at different places.

40 It further consists in an equalizing-lever used in connection with the hoisting-tackle of the carriage, so that the leverage of the draft-animal over the load will be increased.

It still further consists in the arrangement  
45 and combination of parts, which will be more fully described hereinafter.

Figures 1 and 2 are side elevations of a hay-carriage embodying my invention, showing different methods of arranging the ropes. Fig.  
50 3 is an enlarged view of the carriage. Fig. 4 is a plan view of the carriage alone. Fig. 5 is

an inverted view of the two operating-levers. Fig. 6 is a detail view showing the catch by which the carriage is fastened in place. Fig. 7 is a vertical section of the upper portion of  
55 the carriage-frame. Fig. 8 is a vertical section of the two operating-levers, taken through the pivot of one of them. Fig. 9 is a detail view of the swivel-hook connection.

A represents the track, which may be of any  
60 suitable construction.

The carriage-frame B may be of the shape here shown, or any other preferred, and may be composed of two equal parts secured together, with the operating parts of the car-  
65 riage between them, or in any other suitable manner. A plate, C, is secured to the upper part of the carriage-frame B by suitable bolts or rivets. This plate C is held apart from the frame B by means of webs or flanges D,  
70 which are formed upon and constitute a part of the plate. The plate C being attached to the frame B on the side next to the track, the supporting-rollers E are journaled between them and support the carriage upon the track.  
75 The webs D are just sufficiently long to prevent the plate C from binding against the rollers E, so that they will revolve freely while the carriage is traversing the track. Formed  
80 as a part of the webs D, and on the under side of them, are flanges F, which are longer than the webs D, so as to catch under the upper plate of the frame B, as shown in Fig. 7. These flanges F serve as braces to keep the  
85 plate C from slipping upward, and prevents the journals of the rollers E from springing under the weight of the load.

To insure the flanges F from slipping from under the edge of the frame B, in case the connecting bolts or rivets should become loose,  
90 hooks may be formed on the ends of the flanges F, as shown. Below the track are journaled, within the carriage-frame B, two rope-sheaves, I, and passing over the rope in the usual manner is the trip-pulley K. Within the carriage-  
95 frame, and between the two rope-sheaves and the track, are also pivoted the two double-pawl levers M. These levers may be pivoted upon a single pivot or journal, or upon separate ones, as shown in the drawings. In either  
100 case the levers M will be placed substantially side by side, and with ends reversed, so that



the upper ends, which are provided with hooks N, will engage suitable stops or catches, O, on the under side of the track, and hold the carrier from moving in either direction on the track. When the upper ends are released from the catches O, the lower ends, which are provided with suitable clamping devices, will engage the hoisting-rope J and hold it clamped against the rope-sheaves I, so that it cannot pass them in either direction. The pull of the draft-animal on the hoisting-rope J will bring the trip-pulley K in contact with the lower ends of both levers, and will free their upper ends from the catches O and allow the carriage to traverse the track in whichever direction the hoisting-rope may be drawn, when the weight of the load elevated will cause the trip-pulley K to descend sufficiently to allow the lower ends of the levers M to engage and hold the hoisting-rope. The levers M can be made to occupy separate planes within the frame of the carriage, and in this case the grooves in the rope-sheaves I will have to be set out of line with each other, and in line with the end of the lever that operates upon it. The trip-pulley K will also have to be made wide enough to engage both levers, or an intermediate piece will have to be used that will operate both levers. The preferable way is to construct the upper ends of the levers in different planes, while their lower ends are placed in the same plane, as shown in Fig. 5. In this way the clamping ends of the levers, the rope-sheaves, the trip-pulleys, and the hoisting-rope will all be in line with each other, while the upper ends of the levers will engage separate catches on opposite edges of the track without interfering one with the other.

In Fig. 6 is shown the plate P, which is secured to the under side of the track. On the opposite diagonal corners of this plate are formed the two catches, O, which engage the upper ends of the levers M and hold the carriage in position upon the track. By means of this plate the two catches O are held in their proper relative positions without danger of displacement, and each catch being in line with its appropriate lever only it will not interfere with the proper working of the opposite lever. The upper ends of the levers M being bent outward laterally from the center of the carriage will extend beyond the parts of the carriage-frame just under the track which are usually contracted inwardly, so I form recesses in this part of the carriage-frame, as shown in Fig. 5, so that the levers may have free vertical play. The under part of the levers M, against which the trip-pulley K strikes, is preferably made rounding, and the pulley K comes in contact with it, as shown in my Patent No. 290,591, December 18, 1883. This part of the levers is also extended so as to cover and protect the upper part of the opposite lever, as shown in Fig. 8.

When elevating very large loads, or when

a small draft-animal is used, the power of the draft-animal over the load may be increased by the draft-equalizing lever W. One end of this lever W is connected to the trip-pulley K, and the other end is connected to the hoisting-rope J, as shown. About one-third of the distance from the end which is attached to the trip-pulley K, is a hook or eye, from which the load is suspended. This lever can be easily attached or removed without disturbing any other portion of the carrier, and will increase the power or leverage of the draft-animal pulley one-half. It is preferably made bent or curved downward in its center, as shown, so as not to injure the pulley I by coming in contact with it.

I have shown two different methods, substantially the same in principle, and varied only to suit different plans of buildings, where by the movement of the draft-animal in one direction will elevate the load and draw the carriage along the track, and the movement of the draft-animal in the opposite direction will return the carrier to the starting-point. Fig. 1 shows the method employed when the hay is elevated in the center of the barn and carried to either side, and Fig. 2 when the hay is elevated at either end and carried to the opposite end. As the method shown in Fig. 2 is the most preferable, it will be first described. The hoisting-rope J, after passing through the carrier, is conducted along the line of the track to a guiding-pulley, Q, at the end of the track, and thence down to the pulley R on the ground, and thence to the single-tree T, to which the horse is attached. The return-rope *a* is also attached to the carrier and passes from it in the opposite direction to the pulley Q' at the opposite end of the track, and thence down to the pulley R' on the ground, and thence to the single-tree T. As the pulleys R R' are located adjacent to opposite ends of the track, and will necessarily be some distance apart, it will be readily seen that all that is necessary to operate the carrier is for the horse to travel from one pulley to the other, and the load will be elevated and the carrier drawn in opposite directions on the track, care being taken to provide sufficient slack in the ropes to permit the hoisting-rope to descend through the carrier to the load below. Even if the pulleys R R' should not be located a sufficient distance apart to allow the horse to travel between, the horse can travel past the pulley R', through which the return-rope *a* passes, until the slack in the ropes is exhausted; but when the ground-pulleys R R' are located too closely together to allow sufficient room for the travel of the horse, as is the case in Fig. 1, where the rope is conducted from one or both ends through an opening in the center of the building, then the additional pulley, S, is used and the return-rope *a* is passed through it before being connected to the single-tree. In this case the horse will not travel back and forth between the pulleys R R', but will travel out



and back to a point between them, and the pulley S will be located along this line of travel at a point that will afford sufficient room for the travel of the horse, the slack of the ropes being utilized to save distance.

I am aware that hoisting and return ropes have been used in connection with hay-carriers, so that the draft of the horse in opposite directions will draw the carrier in opposite directions on the track; but in these cases the hoisting and return ropes have been conducted to the draft-animal at one end of the barn, thus necessitating more pulleys and rigging, using more rope, and requiring more room for the travel of the horse than is necessary with my invention, besides being more complicated and liable to get out of order and not being adapted to reversible carriers nor to barns in which the ropes have to pass out in the center. In my invention the ropes are conducted from the carrier to the horse as nearly in a direct circuit and to a point as centrally located, and the opposite pulleys are located as nearly parallel to the line of the track and as nearly adjacent to each end thereof as the location of the building will admit, thus securing the most direct connection possible. The ropes will be conducted to one side or the other of the building, unless there is an opening through the building underneath the track, when they may be arranged to have the horse travel through this opening.

It is not material in what way the return-rope is attached to the carrier. All that is necessary is that the connection be sufficient to draw the carrier back on the track and cause the latching device to operate.

Additional guiding-pulleys may be used when the construction of the building require them to pass the ropes around intervening beams or girders.

In Fig. 1 the return and hoisting ropes are shown connected together at both ends, so as to form a continuous rope passing through the carrier and guiding pulleys. This is the preferable way to arrange the ropes in a carrier of the construction herein shown, having the two rope-sheaves I, except when the equalizing-lever W is used. When a continuous rope is used, it will have to be provided with a stop or knot, V', to rest against the frame of the carrier and to prevent the rope from running idly through the carrier, and also with means for attaching the single-tree T to the rope at V. The best way is to have the ropes connected together at both ends U U' by means of a swiveled connecting-hook, as shown in Fig. 9, to which the single-tree can be readily attached or detached, and which is arranged to act as a stop against the frame of the carrier. When arranged in this way, all that is necessary to reverse the carrier is to disconnect the single-tree from the connecting-hook at U, and having the carrier latched to the catches O, so as to free the hoisting-rope, take hold of the return-rope and draw it down until the

connecting-hook U' has passed through the ground-pulley R', and the hoisting-rope J is passed through the carrier to the opposite side, and the connection U rests against its end of the carrier. The single-tree can then be attached to the connecting-hook at U', and the carrier is ready to be operated on the opposite end of the track.

Instead of the two ropes joined together so as to form a continuous rope, as described, one single piece of rope, with suitable stops upon it and having its ends joined together so as to form an endless rope, can be used; but as the return part of the continuous rope does not need to be so heavy as the hoisting part, and as the connecting-hooks are the more convenient for the attachment and detachment of the single-tree, separate ropes of suitable sizes connected together, as hereinbefore described, is the most preferable form of construction. However, I do not limit myself to any particular form of construction, as the details can be varied to suit requirement without departing from the spirit of my invention.

The continuous rope, in whatever form it may be constructed, is not essential to the returning features of my invention, but it is a preferable form of it, especially in reversible carriers of the construction herein shown. The swiveled connection of the ropes serve to let out kinks and twists. When a continuous rope is used, the levers M, clamping the rope against the rope-sheaves I in opposite directions, will prevent it from being drawn through the carrier in either direction while it is traversing the track, thus partly doing away with the necessity for stops on the rope. If the catch O, which engages the lever that holds the rope on the return side were removed so as to let that lever clamp the rope while the load was being elevated, the stops on the rope might be done away with entirely. In that case other means would have to be employed to stop the carrier in its locked position on the track.

When stops or enlarged connections are used on the rope, the guiding-pulleys, with the exception of the pulley S, should be knot-passing pulleys, so as to allow the stops or enlarged connections to pass freely through them.

Having thus described my invention, I claim—

1. The combination of the plate C, having the webs D, the carriage-frame B, and the rollers E, journaled between them, substantially as shown and described.

2. The combination of the plate C, having webs D and extended flanges F, the carriage-frame B and the rollers E, substantially as described.

3. In a reversible carrier, the combination of the two rope-sheaves I, hoisting-rope J, trip-pulley K, and two double pawl-levers pivoted within the frame of the carriage, so that the upper ends of these levers will simul-



taneously engage suitable stops on the track and hold the carrier from moving in either direction on the track, while their lower ends simultaneously clamp the hoisting-rope against the rope-sheaves and hold it from passing in either direction, substantially as shown and set forth.

4. In a reversible carrier, the combination of the two rope-sheaves, the hoisting-rope, the trip-pulley, and the double pawl-levers pivoted side by side within the frame of the carrier and between the two rope-sheaves and the track, so that the upper ends of the levers will engage the stops on the track, and the lower ends engage the hoisting-rope on the sheaves, substantially as shown and described.

5. The combination of the two rope-sheaves, the hoisting-rope, the trip-pulley, and the two levers, as described, the lower or clamping ends of the levers being in line with each other, substantially as described.

6. The combination of the two rope-sheaves, the hoisting-rope, the trip-pulley, the two levers having their lower or clamping ends in line with each other and their upper or hooking ends set or bent out of line, and the catches O, set diagonally on the track so that each lever will engage its own catch only, substantially as set forth.

7. The combination of the two rope-sheaves, the hoisting-rope, the two levers and trip-pulley, arranged to engage both levers simultaneously without the employment of any intervening mechanism, substantially as set forth.

8. The combination of the two rope-sheaves, the hoisting-rope, the trip-pulley and the two levers, having their lower ends set in line with each other and made rounding so that the trip-pulley will engage both levers simultaneously without damage to the pulley, substantially as shown and described.

9. The plate P, secured to the under side of the track, and having the two catches O, formed on its diagonal corners, in combination with the hooked ends N of the levers M, set out of line with each other, substantially as shown and described.

10. The combination of the hook ends N of the levers M, bent laterally outward, the catches O, set diagonally on the track, and recesses formed in the laterally-contracted portions of the carriage-frame so as to permit a free vertical play of the levers, substantially as set forth.

11. The combination of the two rope-sheaves I, the hoisting-rope J, the trip-pulley K, and the equalizing-lever W, for the purpose of increasing the leverage of the draft-animal over the load, substantially as shown.

12. The combination of the two rope-sheaves I, the hoisting-rope J, the trip-pulley K, and the lever W, having the hook or eye for the attachment of the load, and set so as to equal-

ize the draft of the rope, substantially as described.

13. The combination of the elevated track A, a suitable carriage for moving thereon, the guiding-pulleys Q Q' R R', the hoisting-rope J, and the return-rope a, both ropes being attached to the draft-animal, so that the movement of the animal in one direction will elevate the hay and draw the carriage along the track and its movement in the opposite direction will return the carriage to the starting-point, substantially as described.

14. The combination of the elevated track, a suitable carriage for moving thereon, the hoisting-rope J, the return-rope a, the guiding-pulleys Q Q' R R', and the single-tree T, substantially as and for the purpose set forth.

15. The combination of the elevated track, a suitable carriage for moving thereon, the hoisting-rope J, the return-rope a, and the guiding-pulleys Q Q', R R', and S, both ropes being suitably attached to the draft-animal, substantially as and for the purpose set forth.

16. The combination of the elevated track, a suitable carriage for moving thereon, the hoisting-rope J, the return-rope a, and suitable guiding-pulleys for conducting the ropes to a common point, both ropes being suitably connected to the draft-animal, and provided with sufficient slack to allow the movement of the hoisting-rope through the carrier without the necessity of other compensating devices, substantially as described.

17. In a reversible carrier, the combination of two rope-sheaves, a trip-pulley of any suitable construction to operate the locking mechanism, suitable guiding-pulleys, and a hoisting and return rope formed of one continuous piece of rope, or of two or more pieces of rope suitably connected together so as to form a continuous rope, and provided with suitable stops and places for the attachment of the draft-animal, so that the carrier can be reversed by drawing the rope through the carrier and guiding-pulleys from one side to the other and making the attachment for the draft-animal at different places on the continuous rope, substantially as set forth.

18. In a reversible elevator and carrier, the combination of two rope-sheaves, a trip-pulley of suitable construction to operate the locking mechanism of the carrier, suitable guiding-pulleys, and hoisting and return ropes connected together with enlarged connections, so as to form a continuous rope, provided with the necessary stops to keep the rope from running idly through the carrier, substantially as described.

19. In a reversible carrier, the combination of two rope-sheaves, a trip-pulley, a continuous rope, suitable guiding-pulleys, and two brake-levers or clamping devices set to clamp the rope against the rope-sheaves in opposite directions, so as to prevent the rope from passing through the carrier in either direction



while the carrier is traversing the track, substantially as and for the purpose set forth.

20. The combination of the carriage provided with two rope-sheaves, the trip-pulley, 5 suitable guiding-pulleys, and a continuous rope composed of two or more ropes joined together by swiveled connections to let kinks and twists out of the rope, substantially as shown and described.

10 21. The combination of the carriage provided with two rope-sheaves, a suitable trip-pulley, suitable guiding-pulleys, and a con-

tinuous rope composed of two or more ropes joined together by hooked connections for convenience in connecting and disconnecting the 15 ropes and attaching and detaching the hoisting single-tree, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM LOUDEN.

Witnesses:

THOMAS LOUDEN,  
C. E. NOBLE.