

(No Model.)

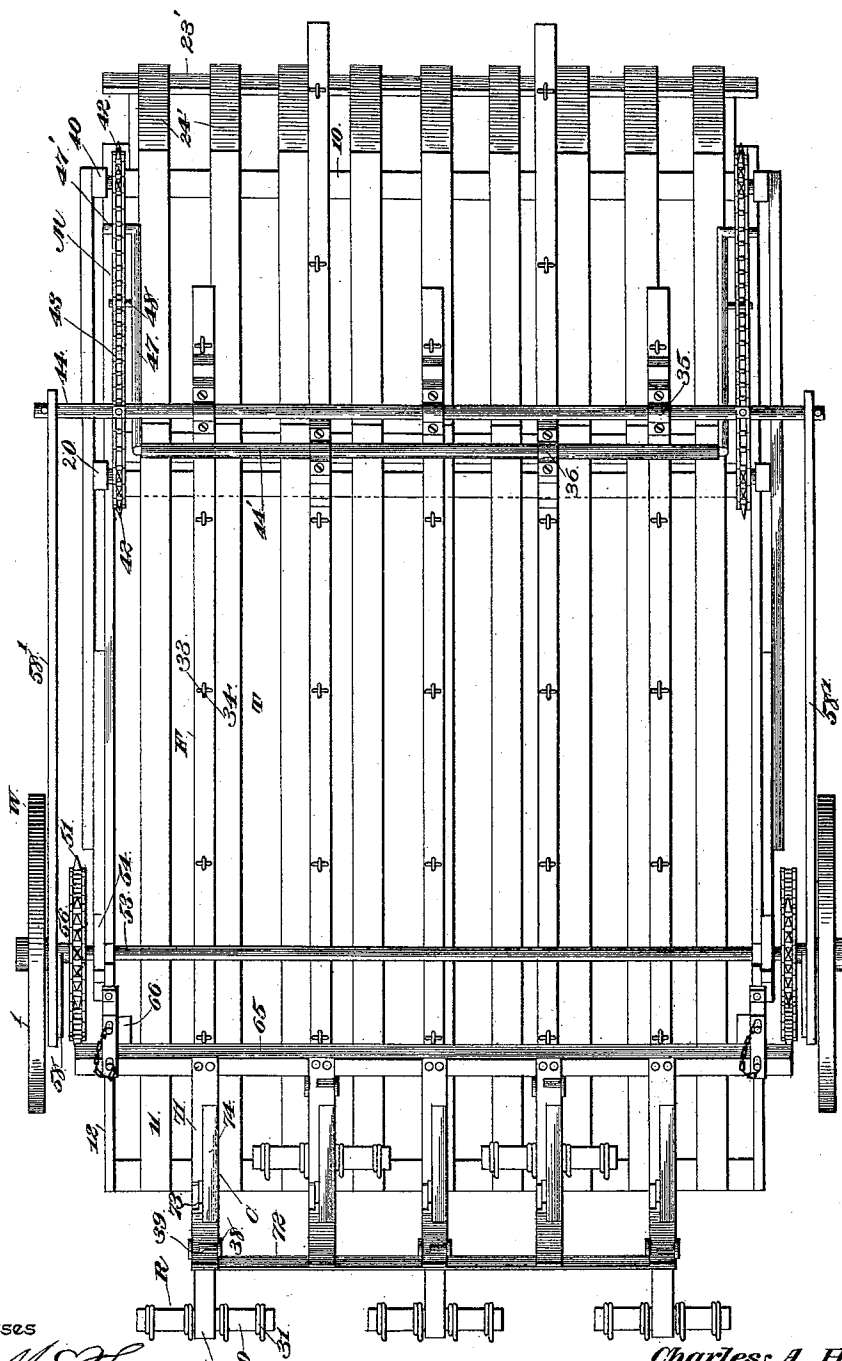
3 Sheets—Sheet 1.

C. A. HENRY.
HAY LOADER.

No. 488,561.

Patented Dec. 27, 1892.

Fig. 1.



Witnesses

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N. L. Collamer

By his Attorneys,

C. A. Snow & Co.

Inventor

Charles A. Henry

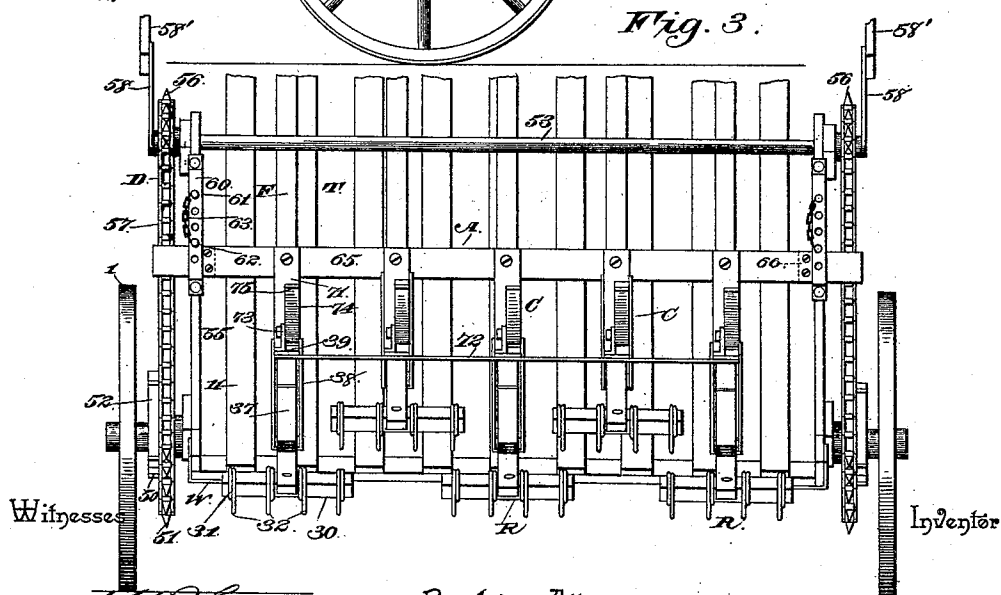
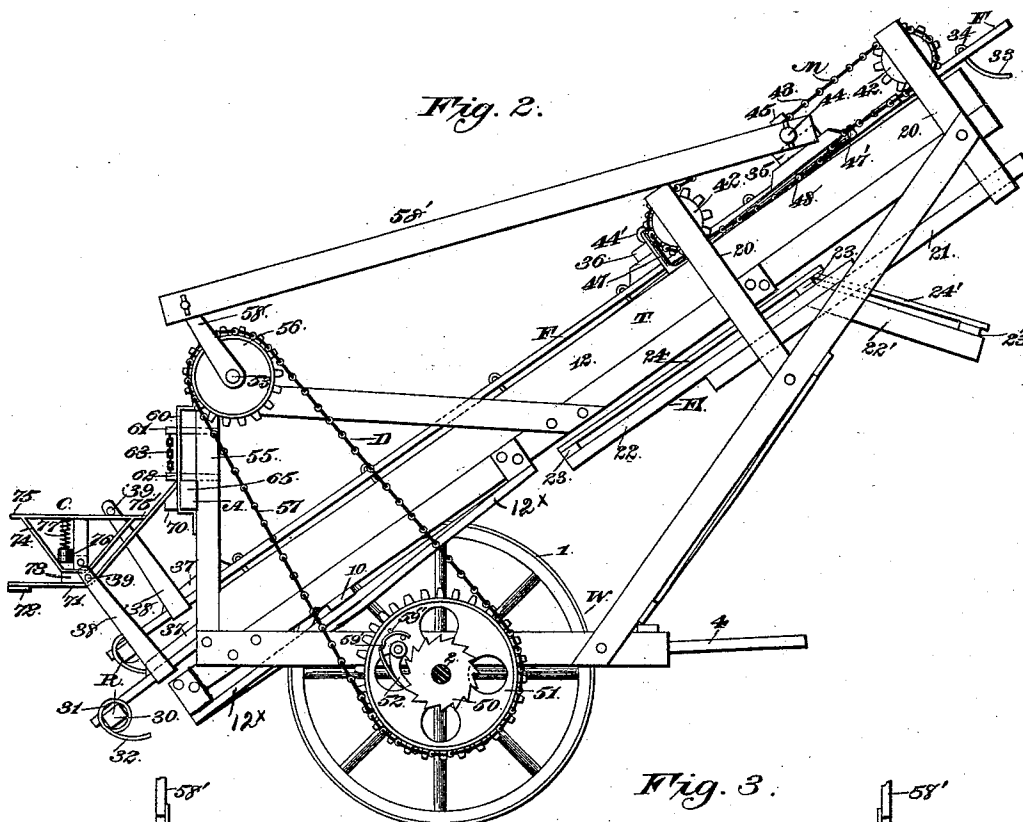
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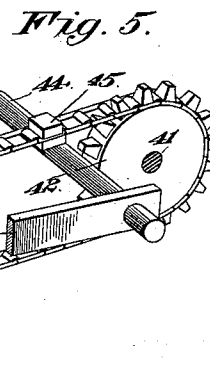
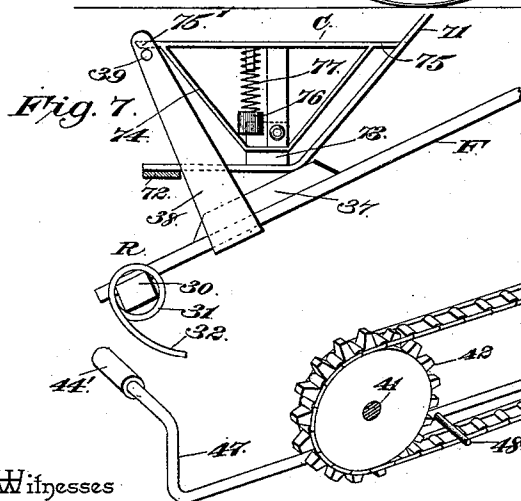
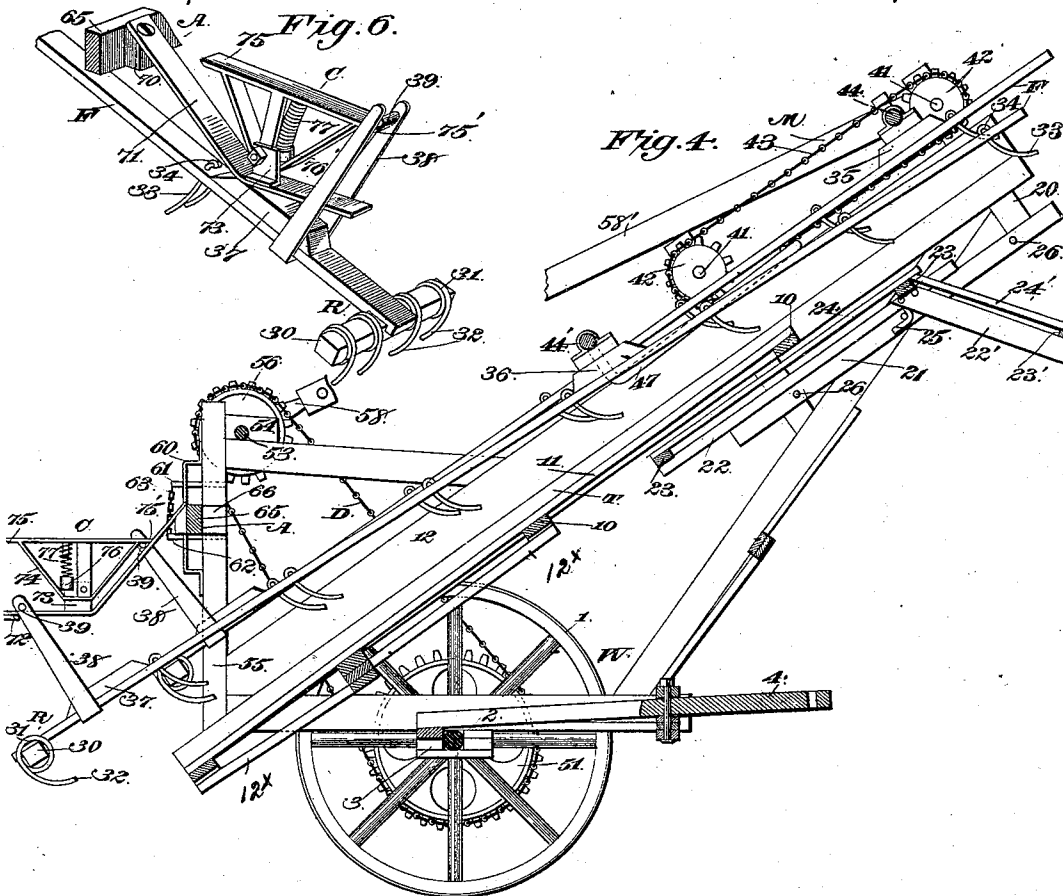
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

CHARLES A. HENRY, OF MONTICELLO, IOWA.

HAY-LOADER.

SPECIFICATION forming part of Letters Patent No. 488,561, dated December 27, 1892.

Application filed December 31, 1891; Serial No. 416,669. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. HENRY, a citizen of the United States, residing at Monticello, in the county of Jones and State of Iowa, have invented a new and useful Hay-Loader, of which the following is a specification.

This invention relates to hay loaders of that class known as walking rakes; and the object of the same is to produce certain improvements in machines of this character.

To this end the invention consists in a hay rake and loader constructed substantially as hereinafter more fully described and claimed, and as illustrated on the accompanying three sheets of drawings, wherein—

Figure 1 is a plan view of this machine with the extension frame drawn out to its fullest extent. Fig. 2 is an elevation of the right side of the machine with the extension frame at its innermost position. Fig. 3 is a rear elevation of the lower part of the machine. Fig. 4 is a longitudinal section showing the adjusting bar raised and the extension frame partly drawn out. Fig. 5 is a detail perspective view of the mechanism for connecting the feed-bars. Fig. 6 is a detail perspective view of one of the catches showing the pin as just slipping off the same. Fig. 7 is an elevation of one of the rake controlling mechanisms showing how the pin is positively prevented from returning above the said mechanism.

This machine comprises the following instrumentalities, each of which is preferably of the specific construction hereinafter set forth at length: A wheeled framework W supports an inclined trough T having an extension frame E at its upper end.

F are feed-bars arranged in two sets and having rakes R at their lower extremities, and said extremities are given peculiar movements by triangular switches and tracks C which are supported by an automatic adjusting bar A; one set being driven by the driving mechanism D, and the other set being driven by the mechanism M which connects it with the first set.

I have shown in the drawings and described herein what I consider the preferable construction of this machine, but I desire it understood that many changes in the details can

be made without departing from the spirit of my invention, while obviously certain parts thereof could be used without others; and the elaboration, specific construction, materials, and sizes of parts will be left to the manufacturer and form no part of the invention proper.

The wheeled framework W.—1, 1 are main wheels mounted loosely on an axle 2, and the latter is journaled in boxes 3 under a framework composed of such sills, bars, and braces as may be necessary but whose exact construction is immaterial, and 4 is a tongue (or in some cases it may be a pair of thills) projecting forward from this framework and to which the team is to be connected for drawing the machine over the ground, or which is to be attached to the rear of a hay-rack when the machine is in operation.

The trough T.—Supported by the framework W in any suitable manner is an inclined trough T preferably comprising transverse beams 10 on which are mounted longitudinal strips 11, the strips terminating short of the upper end of the trough while the sides 12 of said trough extend completely to the upper end thereof. The lower end of this trough travels near the ground while the upper end is high enough to deliver on the top of the highest ordinary load. Strips 12^x are secured to the transverse beams 10 of the sides 12 and form a means of support and securement for parts of the frame.

The extension frame E.—To depending bars 20 on the sides of the trough are secured longitudinal guides 21 on which move bars 22, and to the bars are connected the ends of transverse sills 23 forming the bed of the frame E. From the upper ends of said bars 22 project bars 22' connected at their outer ends by a sill 23'; while 24 are longitudinal strips on the sills 23 and 24' similar strips on the sill 23'—all these strips forming the bottom of the extension frame as will be understood. Depending from the bars 22 are hooks 25 adapted to engage pins 26 projecting inward from the guides 21 to support the extension frame at the desired height. In Fig. 2 this frame is at its lowest point, in Fig. 4 it is partly drawn out, and in Fig. 1 it is completely extended. When first beginning to

load this frame will be in the first of these positions because it is not necessary to raise the hay so high, and this saves raising the weight for one-third of the distance. As the load increases in height the frame is extended as is necessary.

The feed-bars F and rakes R.—As above stated, the feed-bars are arranged in two sets, there being here shown three in one set and two in the other between those of the first. At its lower end each bar carries a rake R of any suitable construction but preferably composed of a cross-head 30 whereon are coiled springs 31 having depending teeth 32. Within the body of each bar throughout its length is inserted a number of teeth, each consisting of a piece of strong spring-wire 33 of inverted U shape whose ends are passed down through the bar and curved forward, and whose body where it rests on the bar is secured thereto by a staple 34. Mounted on the alternate bars are boxes 35 and 36 for a purpose to appear hereinafter; and mounted on each bar near its lower end is a block 37, while secured at its center under the bar opposite the lower end of this block is a U-shaped finger 38 one of whose arms has near its extremity an inwardly-projecting pin 39.

The connecting mechanism M.—At each side of the trough T in its upper end is a pair of uprights which are formed by extending the bars 20 upward and from whose inner faces project stub-shafts 41 whereon are journaled sprocket-wheels 42, the wheels being connected by an endless belt 43. 44 is a transverse bar mounted in the boxes 35, extending across the entire machine, and connected as at 45 to the upper sides of the two belts as shown. 44' is a second transverse shaft standing across the trough at about the center of the latter's length and mounted in the boxes 36; while 47 are rods leading from the ends of this shaft, down, thence forward, and thence outward where they are secured as at 47' to the lower sides of the two belts. 48 are pins projecting outward from these rods, passing over the chains at the under sides of the belts, and travel on the upper edges of the sides 12. It will thus be seen that when the outer bars move down their connecting rod 44 moves the points 45 of the belts down, and this causes the points 47' to move up, whereby the bar 44' moves up and gives the inner bars F a similar motion which is opposite to that of the outer bars.

The driving mechanism D.—Secured to the hub of each main wheel 1 is a ratchet-wheel 50, and journaled on the shaft 2 adjacent this ratchet-wheel is a sprocket 51 carrying a spring-actuated pawl 52 engaging the teeth of the ratchet whereby the sprocket is turned as the machine moves forward. 53 is a main driving-shaft journaled in boxes 54 supported by uprights 55 from the trough, and on this shaft are secured sprockets 56 which are connected by chains 57 with the sprockets 51 on the main shaft or axle. On the outer ends of

the main driving-shaft are cranks 58 which are connected by pitman-rods 58' with the transverse bar 44 above mentioned. Thus when the machine progresses and the main driving-shaft revolves, the cranks cause the bar 44 to be reciprocated longitudinally of the trough, and this gives the feed-bars F the necessary movements.

The automatic adjusting bar A.—60 are upright guide-brackets secured to the rear faces of the uprights 55, the brackets and the uprights being provided with a series of registering holes. 61 and 62 are pins connected in pairs by chains 63, and one of these pins can be inserted in certain of the holes to limit the upward movement while the other pin likewise limits the downward movement of a transverse bar 65 which extends entirely across the machine, passes loosely through the brackets 60, and has blocks 66 which travel against the inner faces of the uprights 55 to prevent its longitudinal displacement.

The rake controlling mechanism C.—Secured to blocks 70 on the rear face of the bar 65 are a number of angular metallic tracks 71 whose rear ends are connected by a transverse bar 72. Rising from each track just in rear of its angle is an ear 73 to which is pivoted a triangular frame 74, the upper side of the latter standing about horizontal and having lips 75 and 75' at its front and rear ends. 76 is a cup carried by the ear, and 77 is a coiled expansible spring seated at its lower end in the cup and its upper end bearing under the upper side of the frame 74 and throwing the front lip 75 down against the inclined portion of the track 71. The arms of the U-shaped finger 38 are spaced just sufficiently to permit them to travel astride these tracks 71, and the ear 73 is at one side of each track so that the pin 39 in each of said fingers can travel uninterruptedly along the other side of the track and around the triangular frame. With this construction, as the feed-bars F rise their pins 39 slide along the horizontal and then up the inclined portions of the tracks, passing under the lips 75 as seen in Fig. 4, and on the return-movement of the bars F these pins pass out over the flat upper sides of the frames 74 as seen in Fig. 2. When each pin reaches the rear lip 75', the block 37 striking under the corner of the track draws down on the finger so that its pin causes the frame 74 to tilt as seen in Fig. 6, and the pin slips off and falls onto the rear end of the track 71 forward of the bar 72. At this time the rake R is in its rearmost position and about to move forward, but supposing it falls on a large pile of hay as the pin slips off the frame—the block described prevents the pin returning over the top of the frame, because it passes under the rear lip 75' and thence down under the inclined rear side of the frame as will be understood. Many inequalities in the ground and in the amount of hay being raked will thus be overcome, and even if the ground undulates considerably, the rake-teeth will

not be embedded therein because the adjusting-bar A can rise within its guide-brackets so that all the catches and rakes can rise and fall as may be necessary.

5 When it is desired to drive this machine over the ground without operating the rakes or the feed-bars, the pawl 52 may be held out of engagement with the ratchet 50 by moving said pawl to the rear, when the notch 59' 10 in the spring 59 will engage the stud or pin 59" to hold the pawl out of engagement with the ratchet—all as will be understood from an inspection of Fig. 2.

With the above construction of parts, the 15 operation of this improved machine is as follows: The tongue being hitched to the rear of the wagon carrying the hay-rack and such wagon being drawn over the field, the rotation of the main wheels 1 communicates power 20 to one set of feed-bars F while the other set is driven through the connecting mechanism M. The rakes R at the rear ends of the feed-bars reach down and out and grasp the hay, drawing it onto the lower end of the trough 25 through the movements of the pins 39 around the frames of the rake mechanism, and after the hay has passed into the trough the teeth 33 grasp it and carry it up therein. The extension frame at its lowest point permits the 30 hay to fall directly onto the hay-rack as will be understood, and as fast as the hay increases the height of the load, the extension frame is raised so as to cause the additional hay to be delivered on the top of the load. 35 As above stated, inequalities in the sizes of the piles or bundles of hay grasped by the rakes will merely cause the latter to rise, but their blocks 37 strike the horizontal portions of the tracks 71 before the pins 39 can pass 40 over the rear lip 75'; and if the ground is undulating or the pile of hay larger than this motion can accommodate, the entire set of rakes and rake mechanism will rise as permitted by the loose mounting of the automatic adjusting bar in the guide-brackets. 45 To limit the movement of the adjusting-bar therein the pins are set in the holes as required, and by this same means the rakes can be held entirely out of operative position when 50 desired.

What is claimed as new is—

1. In a hay loader, the combination with an inclined trough, and means for moving the hay up the same, the upper end of the bottom 55 of the trough stopping short of its sides; of guides on the sides of the trough, bars adjustable in said guides and having bars at their upper ends, transverse sills connecting the bars, longitudinal strips on said sills 60 forming an extension frame, and hooks depending from the said bars adapted to engage pins projecting inward from the said guides for holding the frame in adjusted position, as set forth.

65 2. In a hay loader, the combination with an inclined trough whose sides are continued upward beyond its bottom, and means for

moving the hay up said trough; of guides at the upper ends of the sides of the trough, inwardly-projecting pins on the sides of said 7c guides, bars moving in the guides and having hooks detachably engaging said pins, and connections between said bars forming an extension frame, as set forth.

3. In a machine of the class described, the 75 combination with the feed-bars arranged in two sets and having teeth, a transverse bar connected with each set, and means for reciprocating one of the transverse bars; of endless belts moving over idle-wheels and hav- 80 ing their upper sides connected to said transverse bar, and connections between their lower sides and the other transverse bar, as set forth.

4. In a machine of the class described, the 85 combination with the feed-bars arranged in two sets and having teeth, a transverse bar connected with each set, and means for reciprocating one of the transverse bars; of endless belts moving over idle-wheels and hav- 90 ing one side connected to said transverse bar, rods leading from the ends of the other transverse bar and connected to the other side of said belts, and pins in said rods moving over tracks, as set forth. 95

5. In a hay rake, the combination with a trough having uprights at its sides near its rear end, perforated guide-brackets thereon, an adjusting-bar passing across the machine and standing loosely in said brackets, and ad- 100 justing pins in certain of the perforations; of feed-bars within the trough and having rakes at their lower ends, means for reciprocating the feed-bars, fingers on the bars having pins, and triangular switches and angular tracks 105 on said adjusting bar engaging said pins for causing the vertical movements of the rakes, as set forth.

6. In a hay rake, the combination with the inclined trough, a longitudinally reciprocating 110 toothed feed-bar in the trough, a rake at the rear end of the feed-bar, and an upwardly-projecting finger on said bar having a laterally-projecting pin; of an angular metallic track, a triangular frame pivotally connected 115 with the track around which frame said pin moves, and a spring throwing the frame normally forward, as and for the purpose set forth.

7. The combination, in a hay rake, with an 120 inclined trough, a longitudinally-reciprocating toothed feed-bar in the trough, a rake at the rear end of the feed-bar, and an upwardly-projecting finger on said bar having a laterally-projecting pin; of a transverse adjust- 125 able bar sliding in upright guide-brackets, an angular track carried by said transverse bar, a frame pivotally connected with the track around which frame said pin moves, and a spring throwing the frame normally forward, 130 as and for the purpose set forth.

8. In a hay rake, the combination with an inclined trough, a longitudinally-reciprocating toothed feed-bar in the trough, and a U-

shaped finger its ends rising from the bar and one of them having an inwardly projecting pin; of an angular track having an ear adjacent its angle, the arms of said finger moving
 5 astride this track, a triangular frame pivoted to the ear and around which said pins move, the frame having a straight upper side with lips at its front and rear ends, and an expansible spring between a cup on the ear and the
 10 upperside of the frame for throwing the front lip normally into contact with the track, as and for the purpose set forth.

9. In a hay rake, the combination with an inclined trough, a longitudinally-reciprocating toothed feed-bar in the trough, a block
 15 thereon near its rear end, and an upwardly-projecting finger having a laterally projecting pin; of an angular track having an approximately horizontal rear portion, a triangular frame pivotally connected near one of
 20 its angles with the track and having a straight upperside with lips at its front and rear ends, said pin moving around the frame, and a spring throwing the frame normally forward
 25 at which time said block prevents the pin passing over the rear lip, as set forth.

10. In a hay loader, the combination with an inclined trough mounted on wheels, and an extension frame adjustably connected
 30 with the upper end of said trough; of feed-bars in two sets located within the trough and having teeth in their bodies and rakes at their lower ends, means for causing the upper ends of the bars to reciprocate simultaneously and
 35 oppositely, uprights projecting from said bars and having projections, and movable triangular switches and angular tracks substantially as described adapted to be engaged by the projections of said uprights to engage the

rakes with the hay, the switches and tracks 40 being supported on a transverse adjusting-bar whose ends move in guides supported by the framework, as and for the purpose set forth.

11. In a hay-loader, the combination with
 45 an inclined trough mounted on wheels, and an extension frame adjustably connected with the upper end of the trough; of feed-bars in two sets located within the trough and having teeth in their bodies and rakes at their
 50 lower ends, means for causing the upper ends of the bars to reciprocate simultaneously and oppositely, uprights extending from said bars and having projections and movable triangular switches and angular tracks substantially as described adapted to be engaged by
 55 said uprights of the bars for causing the lower ends of the latter to move so as to engage the rakes with the hay, as and for the purpose hereinbefore set forth.

12. In a hay loader, the combination with
 60 an inclined trough mounted on wheels, of feed-bars in two sets located within the trough and having teeth in their bodies and rakes at their lower ends, means for causing the upper ends of the bars to reciprocate simultaneously
 65 and oppositely, and movable switches of triangular form and angular tracks substantially as described for causing the lower ends of said bars to move so as to engage the rakes with the hay, as and for the purpose set forth. 70

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES A. HENRY.

Witnesses:

J. H. SIGGERS,
 E. G. SIGGERS.