

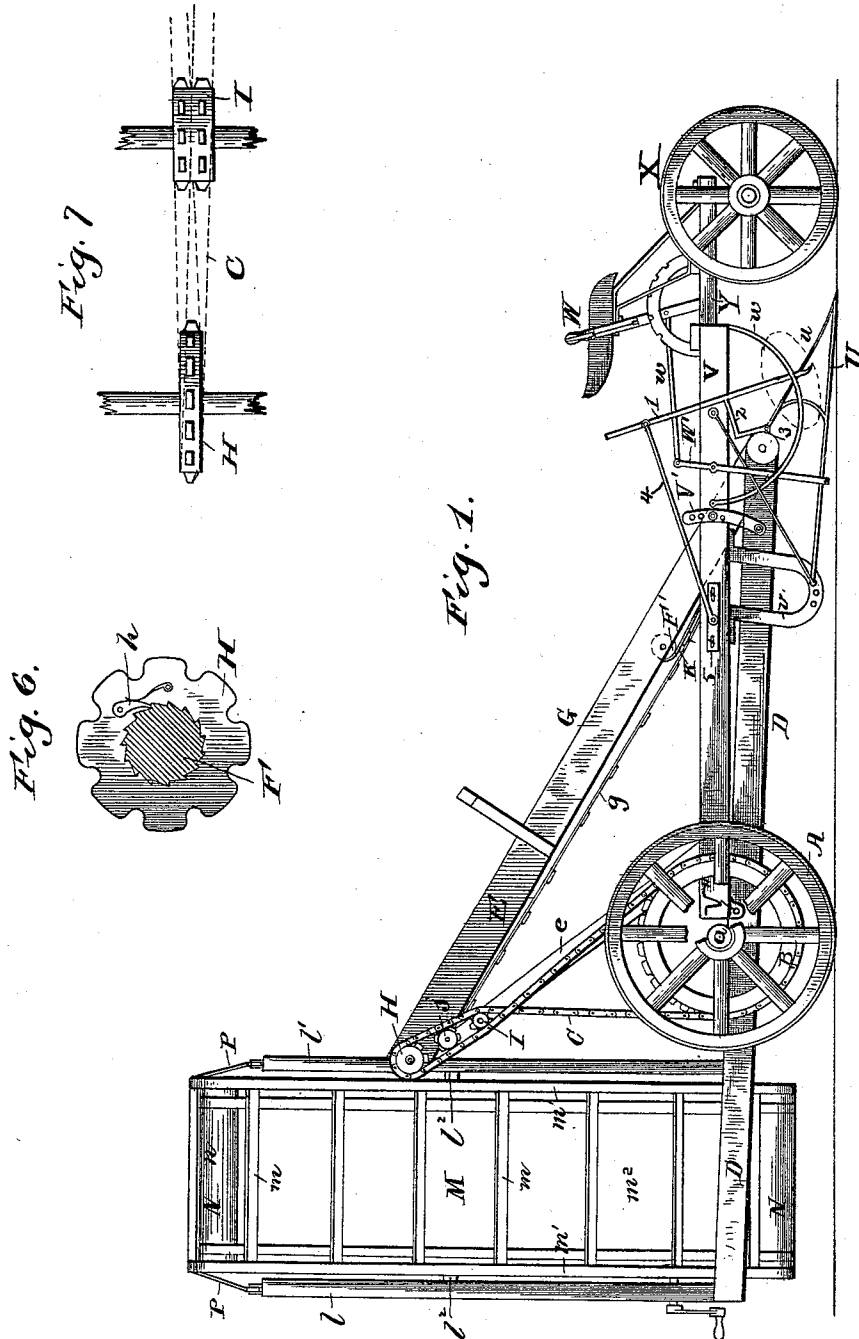
(No Model.)

4 Sheets—Sheet 1.

J. W. HUNTER & T. N. LAKIN.
HAY LOADER.

No. 461,168.

Patented Oct. 13, 1891.



Witnesses:

J. B. McGivver.
A. McHamilton

Inventors.

John W. Hunter and
Thomas N. Lakin
By Charles & William B. King
attorneys

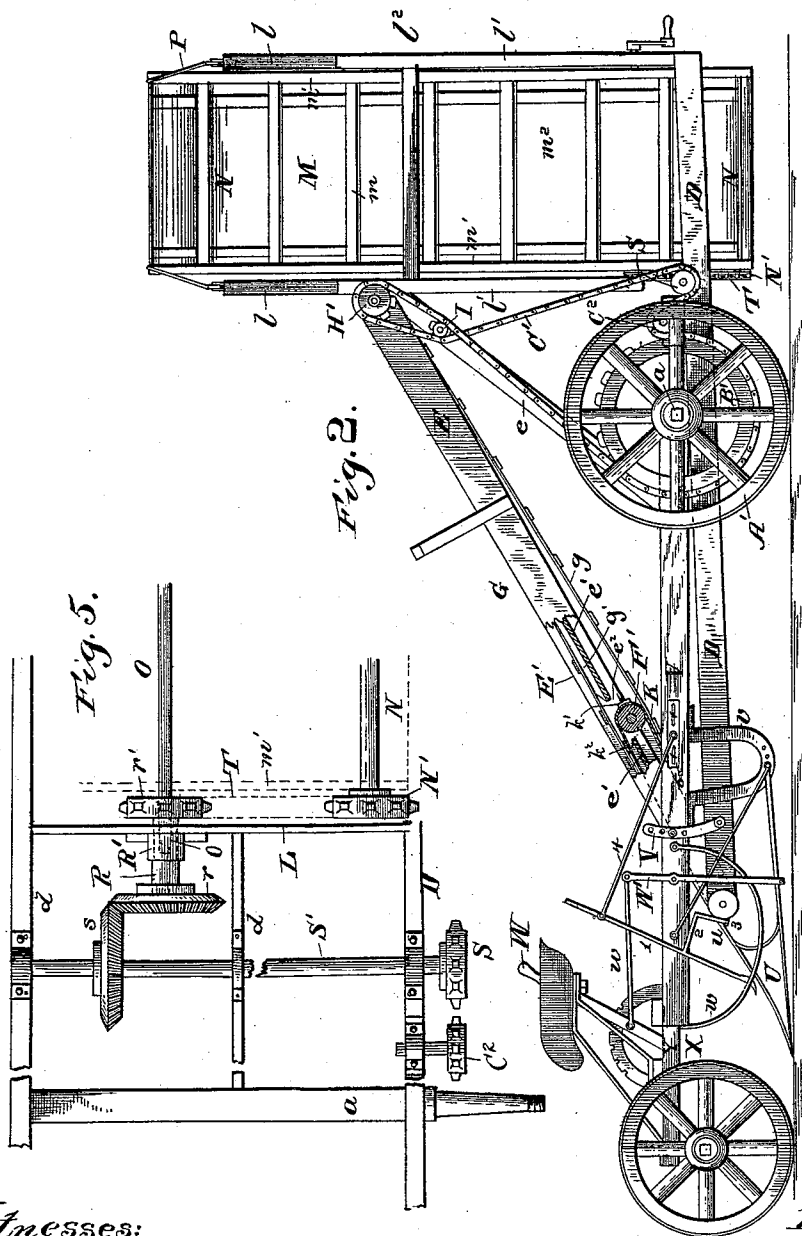
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Witnesses:

J. B. McGirr.
A. M. Hamilton

Inventors

John W. Hunter and
Thomas N. Lakin,
for Charles W. Williams, B. King
Attorneys

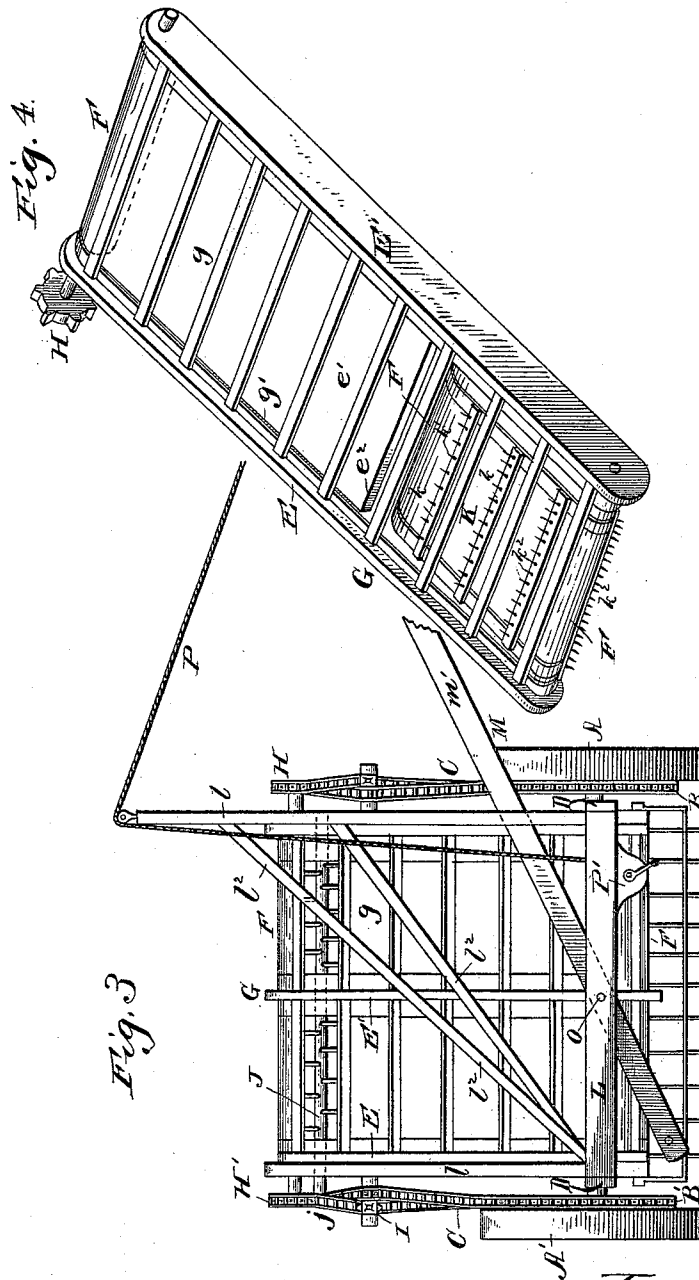
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Witnesses:
J. B. McGirr.
J. S. Barker.

Inventor
John W. Hunter and
Thomas N. Lakin
By Charles William B King atty.

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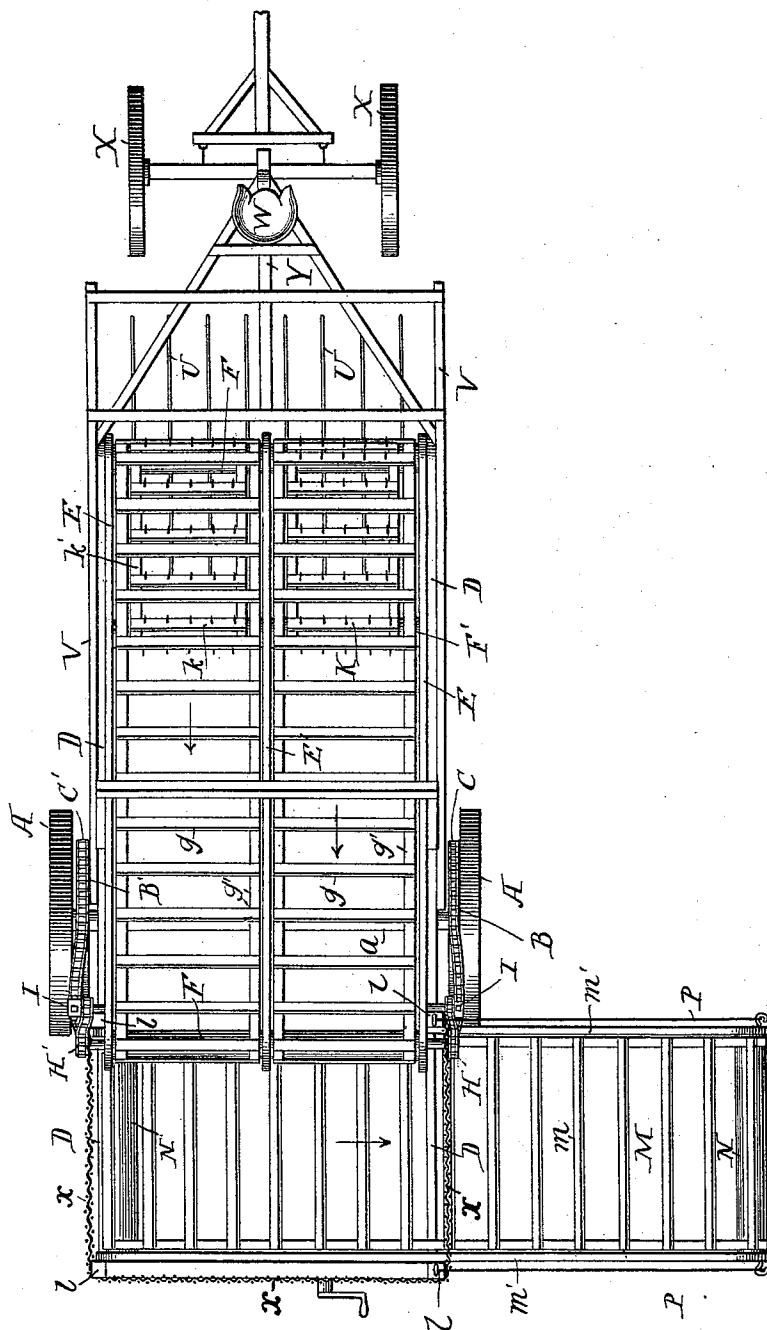
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Fig. B.



WITNESSES

John G. Hinkel
J. S. Barker

INVENTORS

John W. Hunter and
Thomas N. Lakin.
By Charles William Bering
Attorneys

UNITED STATES PATENT OFFICE.

JOHN W. HUNTER AND THOMAS N. LAKIN, OF OWANECO, ILLINOIS.

HAY-LOADER.

SPECIFICATION forming part of Letters Patent No. 461,168, dated October 13, 1891.

Application filed November 3, 1890. Serial No. 370,097. (No model.)

To all whom it may concern:

Be it known that we, JOHN W. HUNTER and THOMAS N. LAKIN, citizens of the United States, residing at Owaneco, in the county of Christian and State of Illinois, have invented certain new and useful Improvements in Hay-Loaders; and we 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 appertains to make and use the same.

Our invention has for its object to produce a hay-loader having a main inclined elevator with a collecting rake at its lower forward end and another elevator in rear of the main elevator and to one side thereof which takes the hay from the main elevator and delivers it onto the wagon being loaded, this last elevator being adjustable to suit the condition of the load; and our invention consists of the various improved arrangements of the parts of such a hay-loader and in the improved combinations of devices for rendering the same effective.

In the drawings, wherein is shown a machine embodying our invention, Figure 1 is a side elevation of the machine. Fig. 2 is a similar view from the opposite side. Fig. 3 is a rear view. Fig. 4 is a perspective view of one of the main-elevator belts and one of the transfer-elevator belts with their turning rollers and side frame-pieces, said parts being shown detached from the machine. Fig. 5 is a plan view of the driving mechanism for the side elevator. Fig. 6 is a detail view showing the connection of the sprocket-wheels with the main-elevator roller. Fig. 7 is a detail plan or edge view of the double sprocket-wheels I. Fig. 8 is a plan view of the loader.

In the drawings, A A' represent the main supporting and driving wheels, which are provided with sprocket or belt wheels B and B', preferably arranged on the inside of the wheels.

The frame of the main inclined elevator G consists of the sills D, which are suspended below the main axle *a* in order to bring the frame low down, the inclined side pieces E, and suitable bracing-pieces *e*. This elevator-frame inclines downward toward the front—that is, in the direction of movement of the loader—and in this respect possesses

the advantage of not requiring the hay being gathered to change the direction of its movement from the time it is first lifted by the rake-teeth until it is delivered from the elevator.

In the opposite ends of the side pieces E of the elevator-frame are mounted the two turning rollers F for the main elevating webs or belts *g*, there being, by preference, two of these belts, separated by the central division-board E'.

Upon the ends of the upper roller F are mounted the sprocket-wheels H and H', to which motion is communicated from the large sprocket-wheels B B' through the belts or chains C and C'. The wheels H and H' have a ratchet-and-pawl connection *h*, as shown in Fig. 6, with the shaft of the upper roller F, so that the belts or webs *g* shall be driven at all times by the fastener-moving driving-wheel, should they not move in unison, without straining any of the parts.

In order that the elevator web or belt shall be driven in the proper direction, it is necessary that the driving-belts C and C' be crossed, and to effect this when the driving-belt is in the form of a sprocket-chain, as shown, without undue friction of the parts of the chain upon each other we interpose the double sprocket-wheels I at the points adjacent to where the strands of the belts cross each other. These wheels serve not only to separate the two lines of each belt, but also to tighten them.

There is a tendency, particularly when a belt or web having teeth is employed, for the hay to be carried thereby past the upper end roller and down the under side of the elevator, where it accumulates in such quantities as to more or less obstruct the working of the elevator. In order to prevent this we may employ some means for positively clearing the belts *g* of all hay which may adhere thereto after they have turned the upper roller, such as the beater J, which extends transversely across the under face of the elevator. This beater strips the hay from the web, and yet is revolved so slowly as not to wind it around itself. It may receive its motion in any convenient manner, as from the belt C, the end of the shaft of the beater having on it a sprocket-wheel *j*, with which the chain

engages. We prefer, however, not to employ teeth on the slats of the main elevator, but to leave them plain, in which event it is necessary to make use of some means for positively taking the hay from the rack and delivering it to the main elevator. The device which we prefer for this purpose consists of a short transfer belt or belts K, one being employed in connection with each main-elevator belt. These transfer-elevators are constructed substantially like the main elevators, the slats k being spaced apart exactly the same distance as are the slats of the main elevators, the width of the transfer elevators being, however, less than the width of the main elevators, so that they may both travel around the same lower turning roller F without interfering with each other, the endless bands k' of the transfer-elevator running just inside the similar bands of the main elevator, as shown in Fig. 4. The slats k are provided with teeth k^2 , which are adapted to strip the hay from the rake and advance it with the elevator. The upper roller F', around which the transfer-elevator belts pass, is mounted in the frame-pieces E E', but in a plane different from that occupied by the upper and lower turning-rollers F, which causes the upper or working face of the transfer-elevators to move in planes different from those in which the main-elevator belts move. The top of the roller F' is so far below the plane of the working faces of the elevators g that the working faces of the transfer-belts are gradually drawn down away from the main elevators, leaving the hay upon the latter, which alone are sufficient to elevate after it has been once well laid thereon. The belts or elevators K and g move with the same velocity, so that there is no dragging upon the hay while the teeth k^2 are being gradually withdrawn from engagement therewith as the transfer-belts leave the main-elevator belts or webs.

The main-elevator frame is provided with a floor e' , over which the working faces of the elevators g and K move. This floor is cut away at e^2 for the mounting of the roller F' and the passage of the short transfer-elevator as it turns.

g' are strips arranged along the edges of the floor e' of the elevator and serving to support and form tracks upon which run the endless bands of the main-elevator webs which carry the slats thereof. These strips serve to elevate and sustain the main-elevator webs above the floor e' , so that the hay can sag slightly below the surface of the slats, which thereby obtain a better engagement therewith and more surely elevate it.

The sills D extend rearward beyond the wheels A A' and are connected by the cross-bars L L. l' are posts which rise from the sills D, and are near their upper ends braced by the rods or bars l^2 . The frame-work thus formed is directly back of and below the upper rear end of the main elevator and above

the transverse side elevator M, to be described. If found desirable, this frame may be inclosed by sheeting or other light material, (shown at x in Fig. 8.) thus forming a receptacle with closed sides directly over the transverse elevator, into which the main elevator may deliver.

M represents the side or transverse elevator, mounted with its inner portion beneath the end of the main elevator, and which is adapted to elevate the hay, which is fed thereon by the main elevator onto the wagon. It consists of the slatted belt or web m , the rollers N, around which it passes, and the side pieces m' , between which the belt is situated, and the floor m^2 . This elevator is pivotally supported upon a rod O, mounted in the cross-bars L, this pivotal support permitting the outer or free end of the side elevator to be so raised as to suit the height of the wagon-body or the load which may have been accumulated thereon.

To effect the adjustment of the free end of the elevator M, and hence its inclination, we make use of the ropes or chains P, which are secured to the elevator near its outer end and are also secured to some winding device on the main frame-work of the machine, such as the drum P'. The ropes P pass over guide-pulleys in the upper ends of the posts l .

We will now describe the mechanism for giving to the belt of the elevator M its proper motion, which it receives from the belt or chain C'. This chain in its course engages with a sprocket-wheel S on the shaft S', which is suitably mounted in the sill D and the frame-pieces d in rear of the main axle. (See Fig. 5.) Near one end of this shaft is secured a bevel-wheel s , which drives a bevel-pinion r on the end of a hollow shaft R, loosely mounted in the bearing R' and on the rod or shaft O, which forms the support on which the swinging side or transverse elevator is mounted. The end of the hollow shaft R opposite to that carrying the pinion r is provided with a sprocket-wheel r' , which is connected by the chain T with the sprocket-wheel N' on the end of the lower turning roller N of the transverse elevator. We prefer to drive the lower roller of the elevator rather than the upper one, as the gearing is mounted lower down, and the weight being thus added to the shorter arm of the elevator N tends to better balance it.

By taking the power which drives the transverse or side elevator from a wheel mounted upon the shaft around which the elevator swings and from thence to one of the rollers of the elevator belt or web we insure that the driving connections shall not be interfered with by reason of changes in the inclination of the elevator.

C² is a sprocket-wheel at the end of a short shaft supported on one of the sills D and arranged to be engaged by the drive-chain C'. Its purpose is to deflect the chain in order that it may be made to engage with a larger

portion of the wheel S than it otherwise would.

U indicates the rake, which is mounted beneath the forward end of the main elevator, with its teeth extending in front thereof and adapted to rest close to or upon the ground. It is mounted in the brackets *v*, depending from the arms V, which are pivoted at their rear ends to the frame-sills D at *v'*, and supported at their outer ends by the steering-frame X. By adjusting the sill-pieces D up or down and securing them in place by the standards V' the main and inclined elevators, which are supported by such sill-pieces, may be adjusted within certain limits, the lower front end of the main elevator being brought nearer to or farther from the ground.

The rake U may be tilted upon its supports in the brackets *v* in order to raise the points of the teeth over obstructions by means of a hand tilting mechanism consisting of the hand-lever W, within convenient reach of the driver, the lever W', pivoted to the arm V and which may have an arm passing under and supporting the rake-teeth, and the link *w*, connecting the levers W and W'.

u u are bridging-fingers formed in practice of small steel bars or rods and arranged to span or bridge the space between the rake-teeth and the upper surface of the elevators *g* and K, and thereby prevent the hay from working back under the elevators, and at the same time forming a gradual incline up which the hay easily passes from the rake to the elevator. These fingers may be separate, as shown, or connected to each other.

There is a tendency in hay-loaders of the class to which ours belongs—that is, having an endless elevator belt or web—for the hay to accumulate and drag at the lower corners of the elevators, and to prevent such an accumulation we propose to make use of the dividers or guards *w*, which, as shown, are in the form of curved or bowed stationary metallic pieces fastened to the arms V. These guards tend to separate or tear the hay which has been gathered by the rake from the mass of hay to the side of the machine, thus allowing the collected hay to pass freely onto the elevator and tending to keep the lower corners of the elevator free from an accumulation of the hay; but should the hay be heavy and tangled or damp it may be found advantageous to employ a positively-acting divider, like that shown in Figs. 1 and 2, which actively tears apart the hay collected from that to the side. As shown it consists of an arm 1, which we term a "kicker," the lower free end of which is made to travel backward and forward in a plane parallel with the direction of movement of the loader, as indicated by the dotted line, Fig 1. This arm is connected near its middle or a little below by an arm or link 2, preferably of the angular form shown, with a wrist-pin 3 on the exposed end of the roller F or on a wheel or disk carried thereby. Near its upper end the kicker-arm 1 is con-

nected by the link 4 with some fixed part of the machine, these connections and supports for the arm 1 causing its lower end, which may be forked, if desired, to pursue the path indicated so long as the machine is in use, and thus keep the hay from tangling at the lower corners of the main elevator. In order that the path pursued by the lower end of the kicker may be varied, so that it will move higher or lower or more or less forward, we make adjustable the point of connection of the link 4 with the fixed part of the machine, this being secured by pivoting the link to a slotted plate 5, which may be secured to the bar V in different positions. The lower end of the kicker-arm is flexible, so that should it meet an unyielding structure in the course of its movements it will not be broken. It will be understood that there are two of these kicking devices—one at each lower corner of the main elevator.

In front of the main elevator is situated the steering-frame X, to which the team is secured. It is provided with a seat for the driver and is connected by a frame Y with the ends of the arms V, which thus constitute a coupling-frame between the steering-frame and the main supporting frame-work of the machine.

It will be seen that the forward ends of the sill-pieces D are suspended above the ground, so as not to move in contact therewith, by the brackets or arms V'. The forward ends of the sill-pieces are usually raised to their highest position of adjustment when the machine is being moved from place to place and are let down into the proper position for working when in the field. By reason of the rake being hinged at its rear end the machine will operate successfully to gather and elevate the hay, whether the sill-pieces are adjusted to a high or a low position, as the rake-teeth will swing into contact with the ground whatever be the adjustment. In operating upon stony ground or a field containing stumps the sills D will of course be adjusted higher than when the field is smooth.

It will be understood that the transverse side elevator might be removed and the main elevator G be made to deliver directly onto a wagon, which would in such case be secured directly behind the main elevator.

Without limiting ourselves to the precise construction and arrangement of the parts shown, what we claim is—

1. In a hay-loader, the combination of a draft and steering frame, the main elevator inclined downward toward the front, the gathering-rake pivoted at its rear end below the elevator and extending in front of the lower end of the main elevator, the sill-pieces in which the lower end of the main elevator is mounted, the coupling-frame between the steering-frame and the supporting frame-work of the elevator, and the suspending-arms connecting the sill-pieces and the said coupling-frame and by which the said pieces are

held above the ground, substantially as set forth.

2. A hay-loader having the substantially horizontal sill-pieces supported by the axle of the main supporting-wheels, the main inclined elevator, the gathering-rake, and the transverse swinging side-delivering elevator pivoted in frame-pieces placed between said sill-pieces substantially on a level with the axle of the main wheels, whereby the side-delivering elevator and its supports are brought low down, substantially as set forth.

3. In a hay-loader, the combination of the main inclined elevator, a frame-work above the side-delivering elevator at the delivery end of the main elevator, consisting of the four posts *e*, which are adapted to receive a covering and to form a receptacle for the hay, and a transverse side-delivery elevator arranged beneath the said frame-work, substantially as shown and described.

4. The combination of the inclined elevator, the driving sprocket-wheels, the sprocket-wheels on one of the turning rollers of the elevator-belt, the crossed drive-chains between such sprocket-wheels, and the double sprocket-wheels *I*, situated at the place where the chain crosses, substantially as described.

5. In a hay-loader, the combination of the substantially horizontal sill-pieces *D* about on a level with the main axle and extending in rear thereof, the main elevator, which delivers toward the rear, the main driving-wheels, the sprocket gearing and chains connecting the driving-wheels to one of the rollers of the main elevator, the swinging transverse side elevator pivotally supported between its ends between the said sill pieces at about the height of the main axle and arranged below the rear end of the main elevator, and the gearing supported by the sill-pieces *D* and connected with the lower roller of the transverse side elevator and operated from one of the chains of the main driving-wheels, substantially as set forth.

6. In a hay-loader, the elevator inclined downward toward its front and the swinging rake hinged beneath the elevator in rear of its front end and extending forward thereof, and means for swinging the rake on its hinges or pivotal supports, substantially as shown and described.

7. In a hay-loader, the combination of the inclined elevator, the forwardly-extending arms *V*, having the depending brackets, and the rake mounted so as to swing in the said brackets and extending in front of the elevator, substantially as shown and described.

8. In a hay-loader, the combination of the elevator *G*, the supporting sill-pieces *D*, extending below the main axle and in rear thereof, the arms *V*, connected with the sills *D* near the main axle, the draft and steering frame connected with the said arms, and the rake extending in front of the elevator, substantially as set forth.

9. In a hay-loader, the combination, with an inclined elevator and a rake for gathering the hay, of a divider situated adjacent to the lower corner of the elevator for preventing the accumulation and dragging of masses of hay at this place, which consists of the bowed stationary metallic piece *w*, secured at its ends to a frame-piece of the machine, substantially as shown and described.

10. In a hay-loader, the combination of an elevator inclined downward toward the front, where it is provided with a gathering-rake, the sill-pieces in which the lower end of the elevator is mounted, an arm situated at the side of the elevator and extending in front of its lower end and movable in a path substantially parallel with the elevator in the direction of its length, and a connection between the said arm and a rotating part of the loader, whereby the said arm is given a backward-and-forward motion for stirring up the hay which may be gathered by the rake and which tends to lodge and accumulate at the corners of the elevator, substantially as described.

11. In a hay-loader, the combination, with an inclined elevator and a rake for gathering the hay, of an arm situated near the lower corner of the elevator and having near its lower end a connection with a wrist-pin on the lower turning roller of the elevator and near its upper end an adjustable connection with some fixed part of the machine, substantially as shown and described.

12. In a hay-loader, the combination, with an inclined elevator and a rake for gathering the hay, of an arm movable backward and forward in a plane parallel with the direction of movement of the loader, and a connection between such arm and some moving part of the loader to give it motion, as described, in order to prevent the hay from accumulating at the corners of the elevators, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN W. HUNTER.
THOMAS N. LAKIN.

Witnesses:

J. J. DANFORD,
R. H. GRIFFE.