

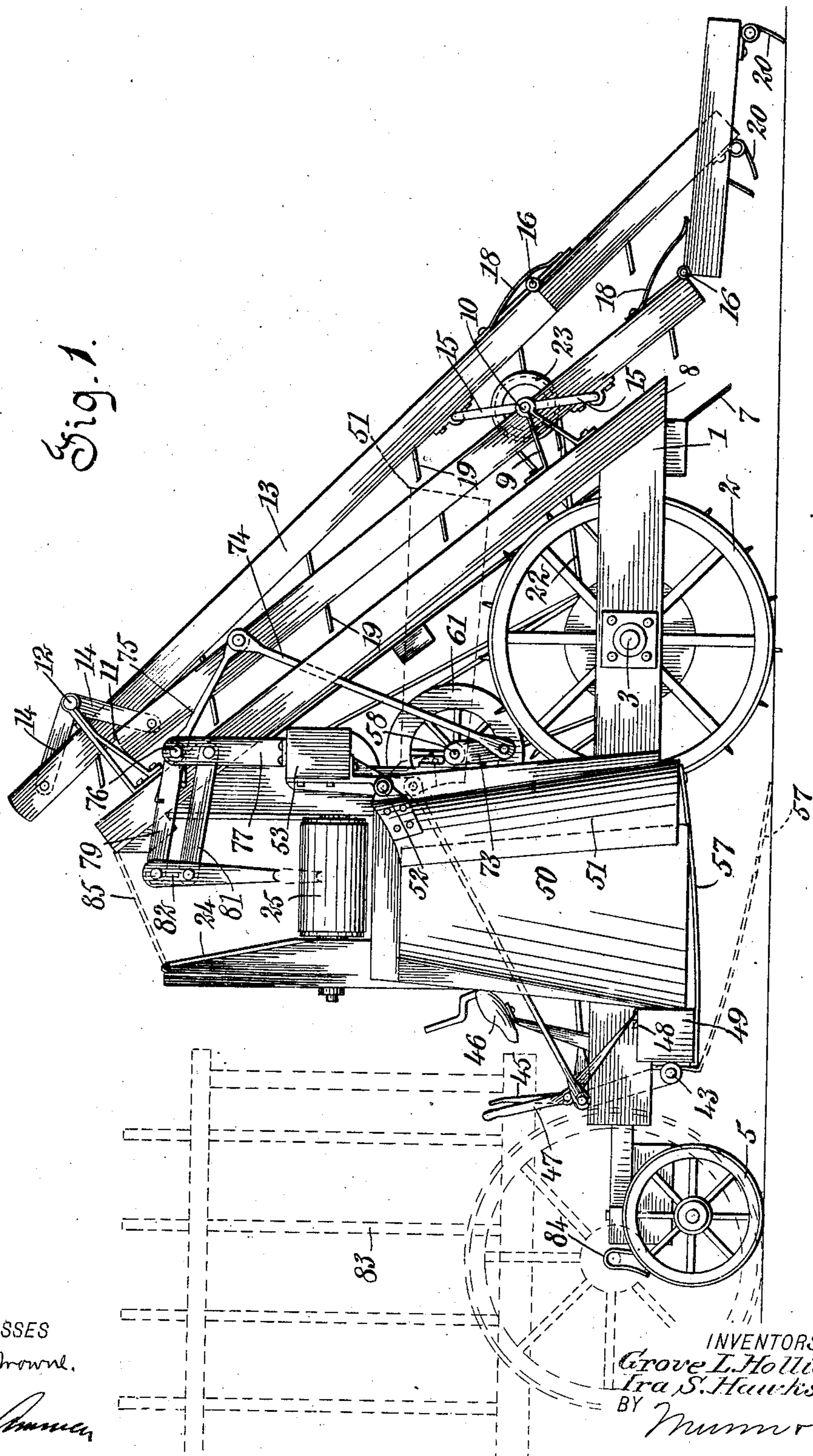
No. 896,541.

PATENTED AUG. 18, 1908.

G. L. HOLLIDAY & I. S. HAWKS.
HAY COCKING MACHINE AND HAY LOADER.

APPLICATION FILED JULY 17, 1907.

4 SHEETS—SHEET 1.



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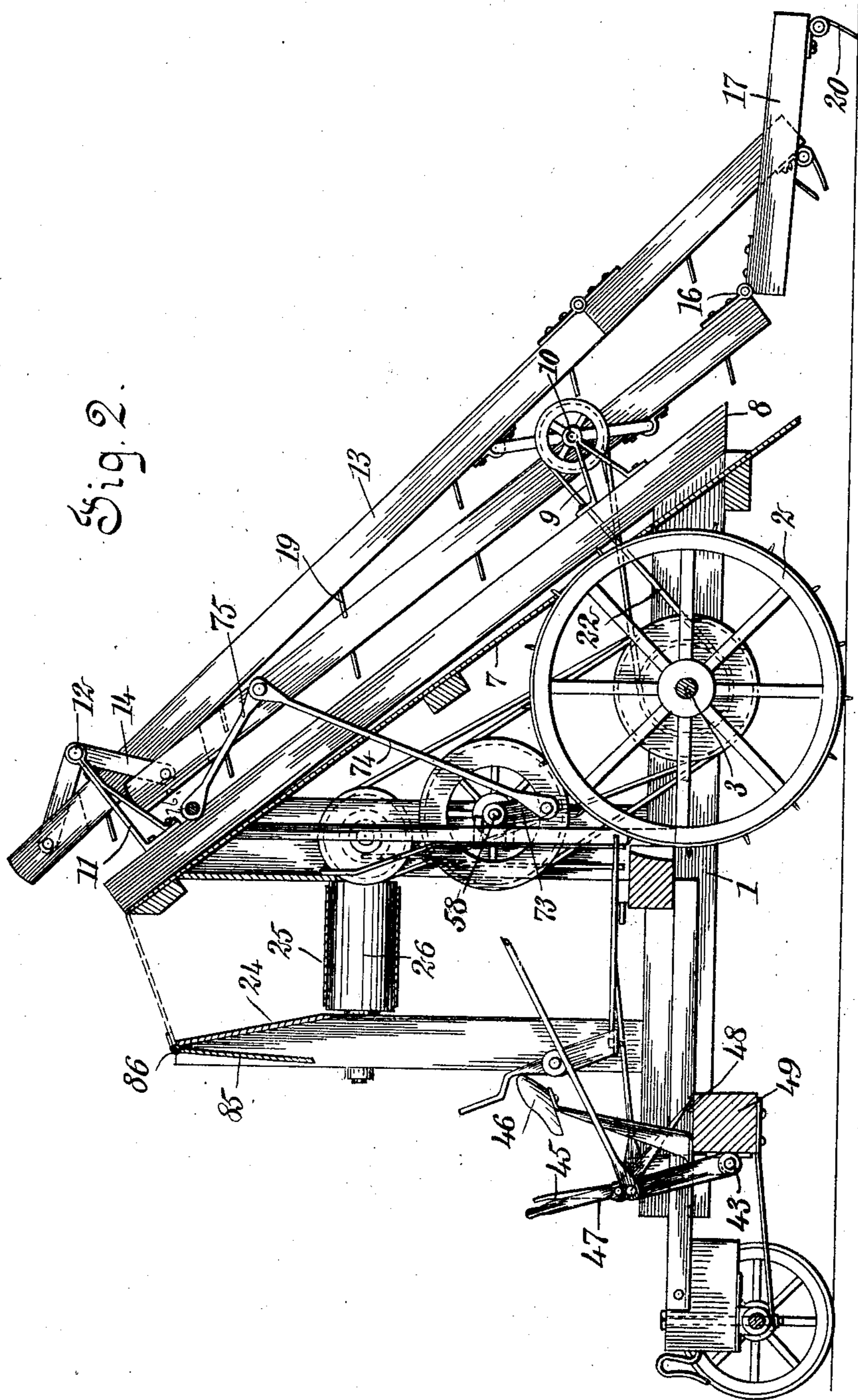
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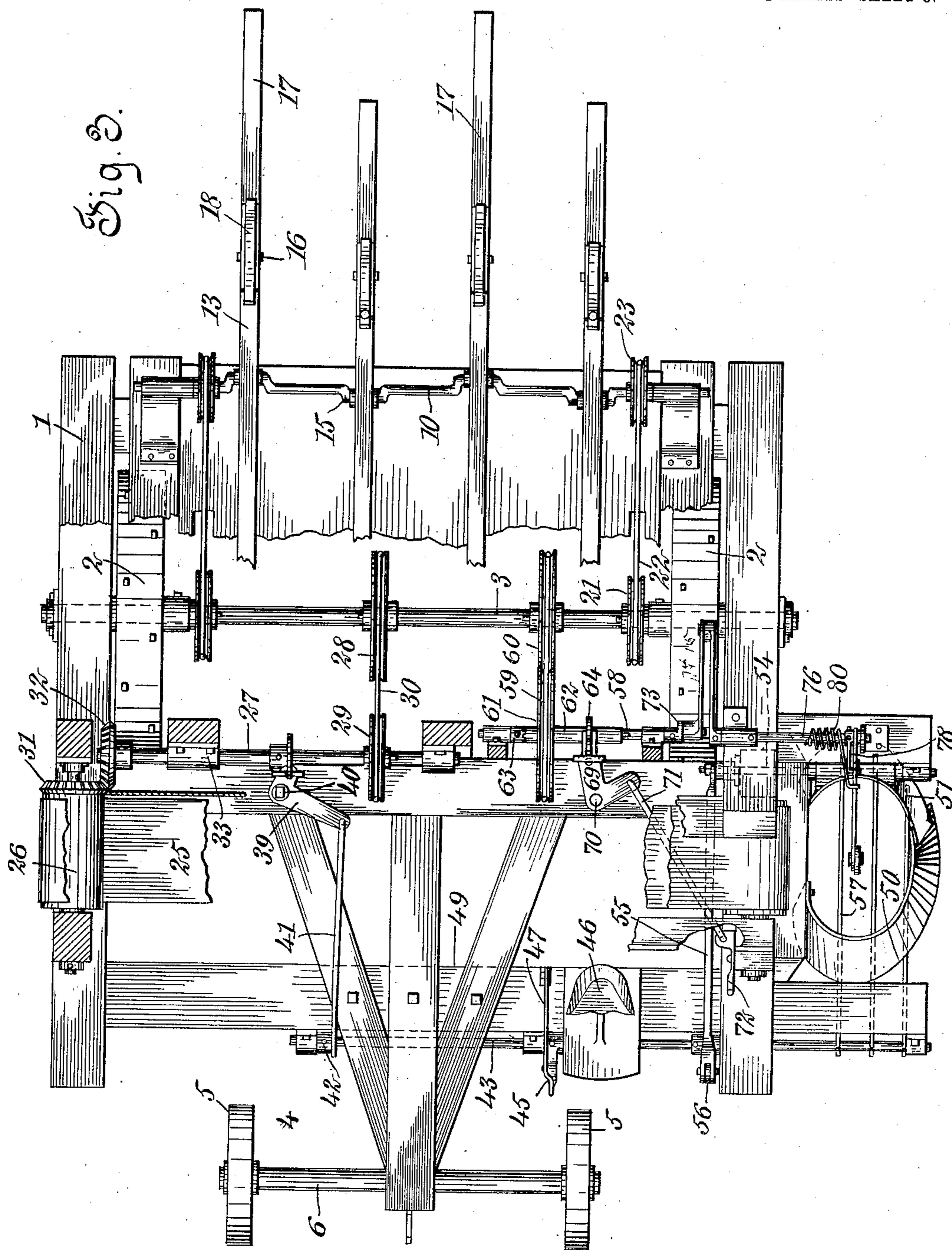
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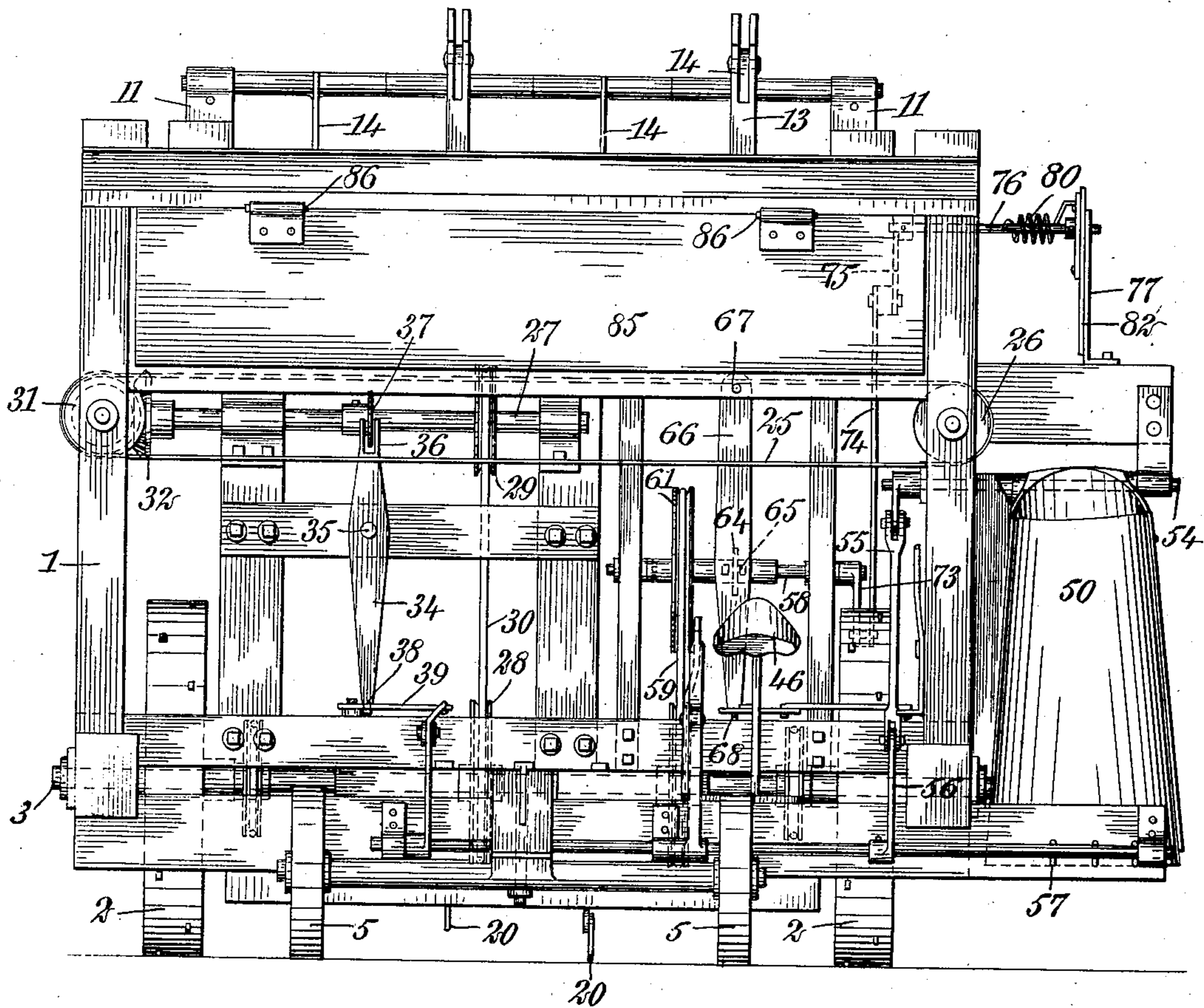
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Fig. 4.



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UNITED STATES PATENT OFFICE.

GROVE L. HOLLIDAY AND IRA S. HAWKS, OF CURTIS, WISCONSIN.

HAY-COCKING MACHINE AND HAY-LOADER.

No. 896,541.

Specification of Letters Patent.

Patented Aug. 18, 1908.

Application filed July 17, 1907. Serial No. 384,205.

To all whom it may concern:

Be it known that we, GROVE L. HOLLIDAY and IRA S. HAWKS, both citizens of the United States, and residents of Curtis, in the county of Clark and State of Wisconsin, have invented a new and Improved Hay-Cocking Machine and Hay-Loader, of which the following is a full, clear, and exact description.

This invention relates to harvesters, and especially to hay-making machines.

The object of the invention is to produce a machine of this class which will operate in a simple manner to form cocks from the hay, and which can be used as a loading device for placing the hay in wagons.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the machine; Fig. 2 is a vertical section through the machine taken in a front and rear direction; Fig. 3 is a plan of the machine, certain parts being broken away and shown in cross section; and Fig. 4 is a front elevation of the machine.

Referring more particularly to the parts, 1 represents the frame of the machine, which is mounted toward the rear upon wheels 2 carried on an axle 3. The forward portion of the frame is supported on a truck 4 having wheels 5 attached to a forward axle 6. At the rear, the frame 1 supports an inclined deck 7, and at the sides of this deck side bars 8 are provided to which brackets 9 are attached, and these brackets support a transverse crank shaft 10. At their upper ends the side bars 8 support brackets 11 carrying a horizontal shaft 12, as illustrated. The shaft 12 and the crank shaft 10 afford means for supporting a plurality of rake bars 13. These bars are attached at their upper ends to the shaft 12 by links 14, and at their lower ends they are attached to cranks 15 formed on the crank shaft 10. The lower extremities of the rake bars 13 are jointed to the upper portions by means of hinge connections 16; these hinged extensions constitute scrapers 17. The hinges 16 are placed on the rear sides, and springs 18 are provided at the lower ends of the bodies of the rake bars, which normally hold the scrapers in longitudinal alinement with the bodies of the rake bars. The inner

or under face of each of the rake bars is provided with inclined forwardly projecting teeth 19. Those teeth which are located on the bodies of the bars project toward the deck 7 and afford means for advancing the hay up the same in a manner which will be described hereinafter. The under sides and extremities of the scrapers 17 are formed with resilient fingers 20 respectively, which advance the hay forwardly toward the lower edge of the deck, as will be described hereinafter.

We provide means for driving the crank shaft 10 from the axle 3. For this purpose, the axle is provided with a sprocket wheel or belt wheel 21 over which runs a chain or belt 22, and this chain or belt drives a sprocket wheel or belt wheel 23 carried on the shaft 10, as shown in Fig. 3. From this arrangement it should be understood that when the axle is rotating, the rake bars will be given a reciprocating and swinging movement.

The upper portion of the machine is formed into a transversely disposed hopper 24, in the lower portion of which a horizontally disposed conveyer belt 25 is arranged, the same being mounted upon suitable rollers 26. This conveyer belt 25 is adapted to be continuously driven, for which purpose we provide a countershaft 27 supported in the frame as indicated in Fig. 3. This countershaft is driven from the axle 3 by means of wheels 28 and 29 carried respectively by the axle and the shaft 27, the same being connected by a suitable chain or belt 30. The countershaft 27 affords means for driving one of the rollers 26 at the right of the machine through the medium of bevel gears 31 and 32, the first of which is rigid with the roller 26 at this point, while the latter is carried by the shaft 27. The countershaft 27 is adapted to slide longitudinally in suitable bearings 33 mounted on the frame as shown. When the countershaft occupies the position shown in Fig. 3, the bevel gears 31 and 32 are in mesh, but if the shaft is shifted longitudinally toward the left, the connection at this point will be broken; hence, these bevel gears 31 and 32 constitute a clutch for connecting or disconnecting the conveyer belt from the mechanism for driving the same. In order to shift this countershaft in the manner suggested, we provide a shifting lever 34 pivotally attached to the frame at 35, as indicated in Fig. 4. The upper end of this shifting lever is formed into a fork 36, which embraces

a collar 37 attached to the countershaft as shown. The lower end of the lever 34 is connected by a pin-and-slot connection 38 with a bell crank lever 39, mounted in a horizontal position as shown in Fig. 3, upon a suitable pivot bolt 40 set in the frame. The long arm of the bell crank lever 39 is attached to a link 41 which extends forwardly and connects, by means of a lever 42, with a lever shaft 43, the said shaft 43 being suitably mounted in a horizontal position at the forward portion of the frame, as shown most clearly in Figs. 1 and 3. The shaft 43 is controlled by means of a hand lever 45 which is in a convenient position to be reached from the seat 46 upon which the operator of the machine sits. This lever 45 is provided with a pivoted locking lever 47, the long arm of which is adapted to engage with the teeth 48 formed on the upper side of the forward cross beam 49 of the frame. From this arrangement, when the lever 45 is thrown forward, the lever 47 may lock it in this forward position by means of the teeth 48. In this way the bevel gear 32 may be locked out of engagement with the bevel gear 31; that is, the transmission through the conveyer belt is disconnected.

At the left side of the machine, the conveyer belt 25 delivers to a barrel 50 which is formed of sheet metal or other suitable material, and of substantially conical form. This barrel is adapted to form the hay cock from the hay which is supplied to it by the conveyer. The rear side of the barrel 50 is provided with a rearwardly movable section 51 which is attached by a hinge connection 52 to a cross beam 53 in the upper portion of the frame. This hinge connection 52 comprises a shaft 54 which extends inwardly toward the central axis of the machine, and is connected by a link 55 and a lever 56 with the aforesaid lever shaft 43. The said lever shaft 43 is extended toward the left of the machine, and is provided with rearwardly extending bars 57 which pass under the barrel 50 as shown. These bars 57 constitute a dumping device. When the shaft 43 is in its normal position, these bars lie close against the bottom of the barrel and support the hay which is being formed therein into a hay cock. However, when the lever 45 is operated, these bars drop down to a position such as that indicated by the dotted lines in Fig. 1, and allow the hay within the barrel to descend to the ground. At the same time this movement of the lever operates, through the link 55, to throw the movable section 51 of the barrel into a rearwardly disposed position, rotating the same upon the hinge connection 52 until it comes into a position such as that indicated in the dotted lines in Fig. 1. In this way the hay which has been formed into a hay cock is allowed to pass out of the machine. In this connection it will be ob-

served that the barrel 50 projects at the left-hand side of the frame of the machine as illustrated in Fig. 3.

We provide means for packing the hay into the barrel as it is received from the conveyer belt 25. For this purpose we provide a countershaft 58 at the left-hand side of the machine, as indicated most clearly in Fig. 3, the said countershaft being mounted in a horizontal position, and driven by a suitable belt or chain 59 which runs over a wheel 60 on the axle 3 and a wheel 61 on the countershaft. The wheel 61 has a sleeve 62 which is formed with clutch teeth at one extremity thereof which mesh with similar clutch teeth formed on a clutch collar 63 which is rigid on the shaft 58. The wheel 61 is adapted to be slid to and fro upon the countershaft so as to close or open the clutch. When the clutch is closed, the rotation of the axle 3 is transmitted to the countershaft 58, and when the clutch is open, the wheel 61 and its sleeve turn idly on the countershaft. In order to clutch or unclutch the shaft in the manner suggested, the sleeve 62 is provided with a collar 64, and this collar is engaged by a fork 65 formed on the side of a shifting lever 66, which is suspended from a pivot bolt 67, as indicated in Fig. 4. The lower end of this shifting lever 66 has a pin-and-slot connection 68 with a bell crank lever 69, the said lever being mounted in a horizontal position upon a pivot bolt 70 secured to the frame as shown in Fig. 3. One arm of this bell crank lever 69 is connected by a link 71 with a hand lever 72 which is mounted at the left of the frame as shown. Evidently, by throwing the lever 72 in one direction or the other, the countershaft 58 may be connected or disconnected.

On the end of the countershaft 58 which is disposed toward the barrel, a crank 73 is attached, and this crank is connected by a link 74 with an arm 75 which is rigidly attached to a packer shaft 76. This packer shaft is mounted in a horizontal position on a suitable standard or bracket 77 set up upon the frame of the machine, as indicated in Fig. 1. Adjacent to the bracket 77 in which the packer shaft 76 is rotatably mounted, the packer shaft is provided with a rigid lifting arm 78 which projects toward the barrel 50. Loosely mounted on the packer shaft 76 adjacent to this arm, we provide a packer arm 79, and this arm is constrained downwardly by a helical spring 80, the body of which is coiled about the packer shaft as shown in Fig. 3. The lifting arm 78, however, supports this packer arm so as to limit the downward movement thereof, forming a rest, as will be readily understood. In this way a flexible connection is brought about at this point. Below the packer arm 79 an auxiliary arm 81 is provided, which is pivotally attached to the bracket 77 in a parallel position

to the arm 79. To the ends of these arms 79 and 80 a packer bar or packer 82 is pivotally attached, and this packer is disposed substantially centrally over the barrel, as indicated most clearly in Fig. 3. The means for mounting the packer 82 constitutes what is known as a parallel movement, the operation of which causes the packer to maintain itself in a vertical position while it moves up and down from the rocking movement of the packer shaft 76. The object in having the flexible connection is to prevent injury to the packer 82 if the hay should become too tightly packed in the barrel. In this connection it should be understood that, in the operation of the packing mechanism, the downward movement of the packer is really produced by the spring 80, which simply holds the packer arm 79 against the lifting arm 78 as the lifting arm descends.

Instead of advancing the hay into the barrel 50 to form hay cocks, the machine may be used as a loading device for passing the hay onto a wagon. This use of the device is illustrated in Fig. 1, where a wagon or hay cart 83 is represented in dotted lines in front of the machine, the machine being hitched to it by a suitable hitching device 84 attaching to the rear axle of the wagon or in any similar manner. In order to enable the hay to pass into the wagon instead of passing into the hopper 24, the forward edge of the hopper is provided with a cover or bridge board 85 which extends longitudinally throughout the entire length of the hopper. When the machine is being used for cocking the hay, this board hangs down as illustrated in Fig. 2, being attached at its upper edge by a hinge connection 86. When the device is used for loading hay upon the wagon, however, this board 85 is folded down in the position in which it is indicated in dotted lines in Fig. 1, so that it bridges the space from the upper edge of the deck 7 across the hopper. It is arranged so that it inclines downwardly toward its forward edge so as to facilitate the movement of the hay across the hopper into the wagon. Of course, when the device is being used for loading hay upon the wagon, the conveyer belt 25 is disconnected from the driving mechanism, as will be readily understood from the foregoing description.

The mode of operation of the entire machine will be briefly recapitulated: The machine when being used as a hay-cocking machine, is drawn along by horses or other draft animals, and the rotation of the axle 3 continuously rotates the crank shaft 10 and operates the rake bars 13. In this way the rake bars pick up the hay with the members 20 and push it up along the deck 7 into the hopper 24. The conveyer belt 25 advances the hay in the hopper toward the barrel 50, where it accumulates so as to form a hay cock. As the hay comes over the barrel 50,

it is pushed down into the barrel by means of the packer 82 which is continuously operated from the countershaft 58 through the medium of the packer shaft 76. When sufficient hay has accumulated in the barrel 50 to form a hay cock, the lever 45 is operated so as to throw the gears 31 and 32 out of engagement. This disconnects the conveyer belt and stops the feeding movement of the hay into the barrel. This movement of the lever also operates, through the link 55, to throw open the rear side of the barrel 50 by rotating the movable section 51 on the hinge connection 52. It also operates, through the rotation of the shaft 43, to dump the hay out of the barrel, the supporting bars 57 being moved downwardly as described.

The operation of the machine when using it as a loading device for wagons, will be clearly understood from the description already given.

A machine constructed as described saves much labor in forming hay into hay cocks, where the hay should be allowed to stand so as to become cured in the usual manner before storing it in stables or barns.

Special attention is called to the flexible connections between the scrapers and the bodies of the rake bars, as this connection enables the scrapers to accommodate themselves to the contour of the ground line at the point where they touch the same. In this way they will operate to pick the hay up efficiently without injury to the rake bars.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. In a machine of the class described, in combination, a frame, a transversely disposed hopper supported upon said frame, means for advancing hay from the ground into said hopper, a cock-forming barrel at the side of said frame, means for advancing hay from said hopper into said barrel, means for disconnecting said last-named means to stop the delivery of hay from said hopper to said barrel, a removable bridge adapted to cover said hopper to permit hay to advance across the same, and means for connecting said frame with a wagon disposed before the same.

2. In a machine of the class described, in combination, a frame, a transversely disposed hopper, means for advancing hay from the ground into said hopper, a conveyer belt in said hopper, a barrel at the side of said frame, a lever shaft, bars carried thereby and projecting under said barrel to support hay therein, said barrel having a movable section adapted to permit the release of a hay cock formed in said barrel, means for actuating said movable section from said lever shaft, means for continuously driving said conveyer, and means actuated by said lever shaft for disconnecting said conveyer belt.

3. In a hay cocking machine, in combination, a barrel in which the hay cock is formed, means for advancing hay thereto, a packer arm, and means for reciprocating said arm including a resilient yielding member transmitting the actuating force to said arm.

4. In a hay-cocking machine, in combination, a barrel in which a hay cock is formed, means for advancing hay thereto, a lifting arm, means for rocking the same, a packer arm, and a spring holding said packer arm upon said lifting arm.

5. In a hay-cocking machine, in combination, a barrel in which the hay cock is formed, a parallel-movement device including a packer adapted to force hay into said barrel, a lifting arm supporting said parallel-movement device, and a spring pressing said device upon said lifting arm.

6. In a machine of the class described, in combination, a frame, an axle, a counter-shaft, a transversely disposed conveyer, a clutch for driving said conveyer, means for raising the hay into said conveyer, a barrel in which the hay cock is formed and receiving the hay from said conveyer, a lever shaft, means actuated thereby for dumping the cock from said barrel, and means actuated by said lever shaft to disconnect said clutch.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GROVE L. HOLLIDAY.
IRA S. HAWKS.

Witnesses:

EMMA VIRCK,
ESTELLA HICKOK.