

D. PRILLIMAN.  
HAY GRINDING MACHINE.  
APPLICATION FILED MAY 18, 1909.

954,540.

Patented Apr. 12, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

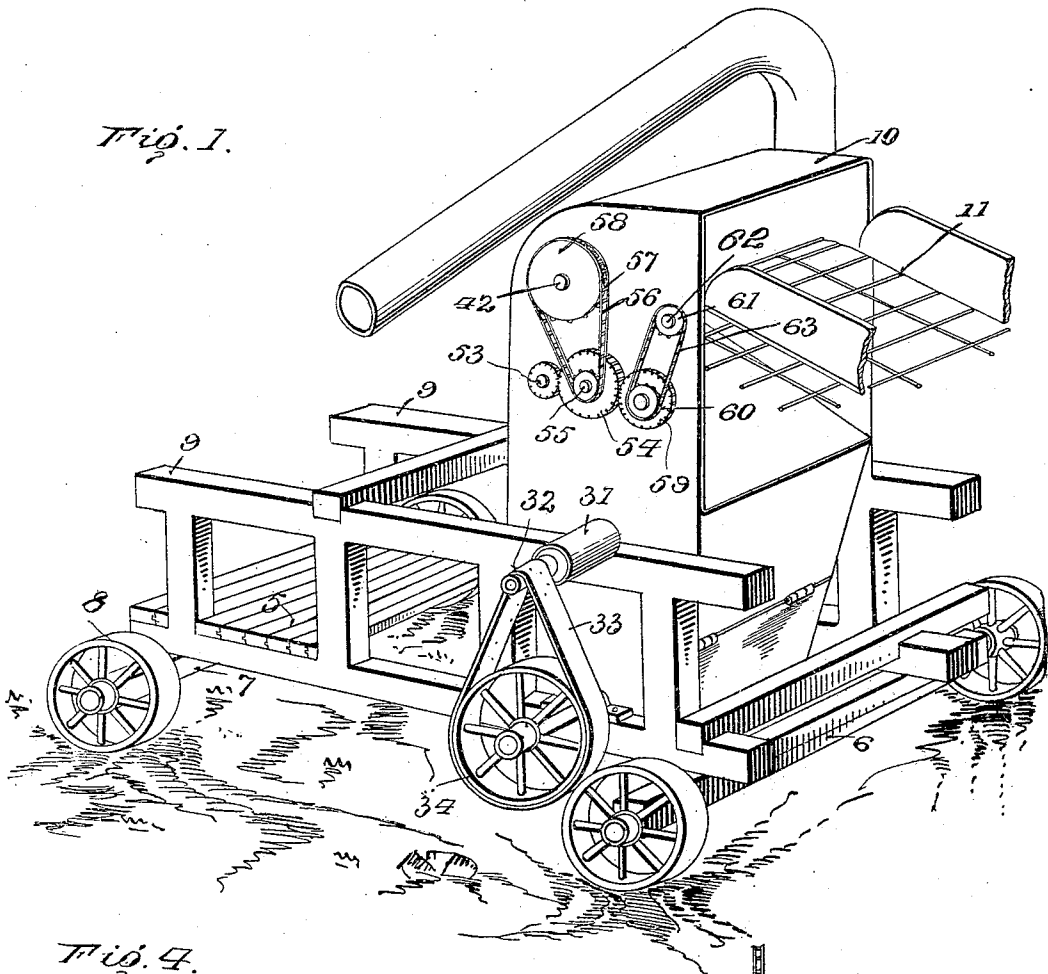
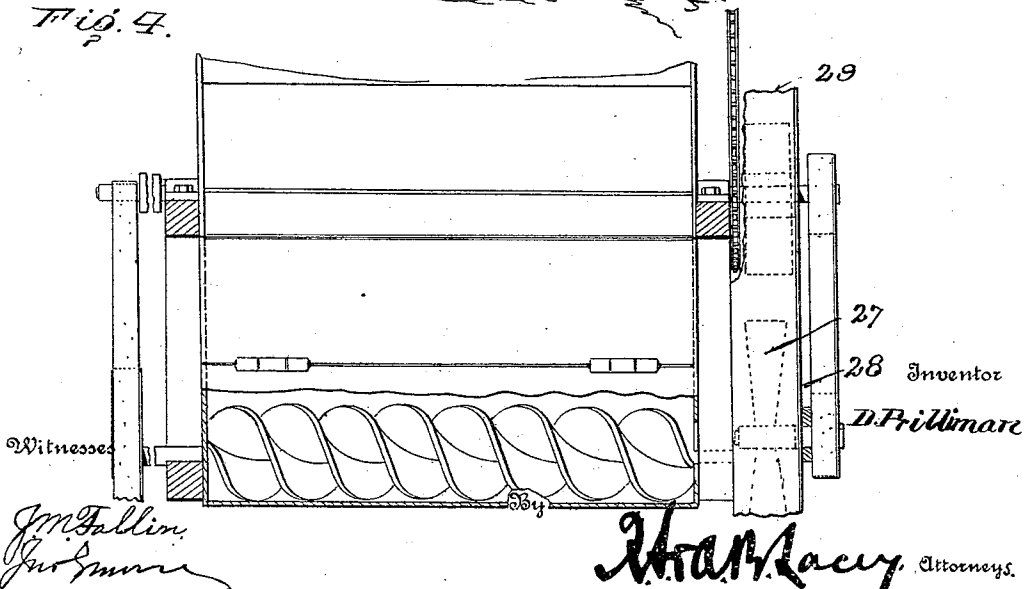


Fig. 4.

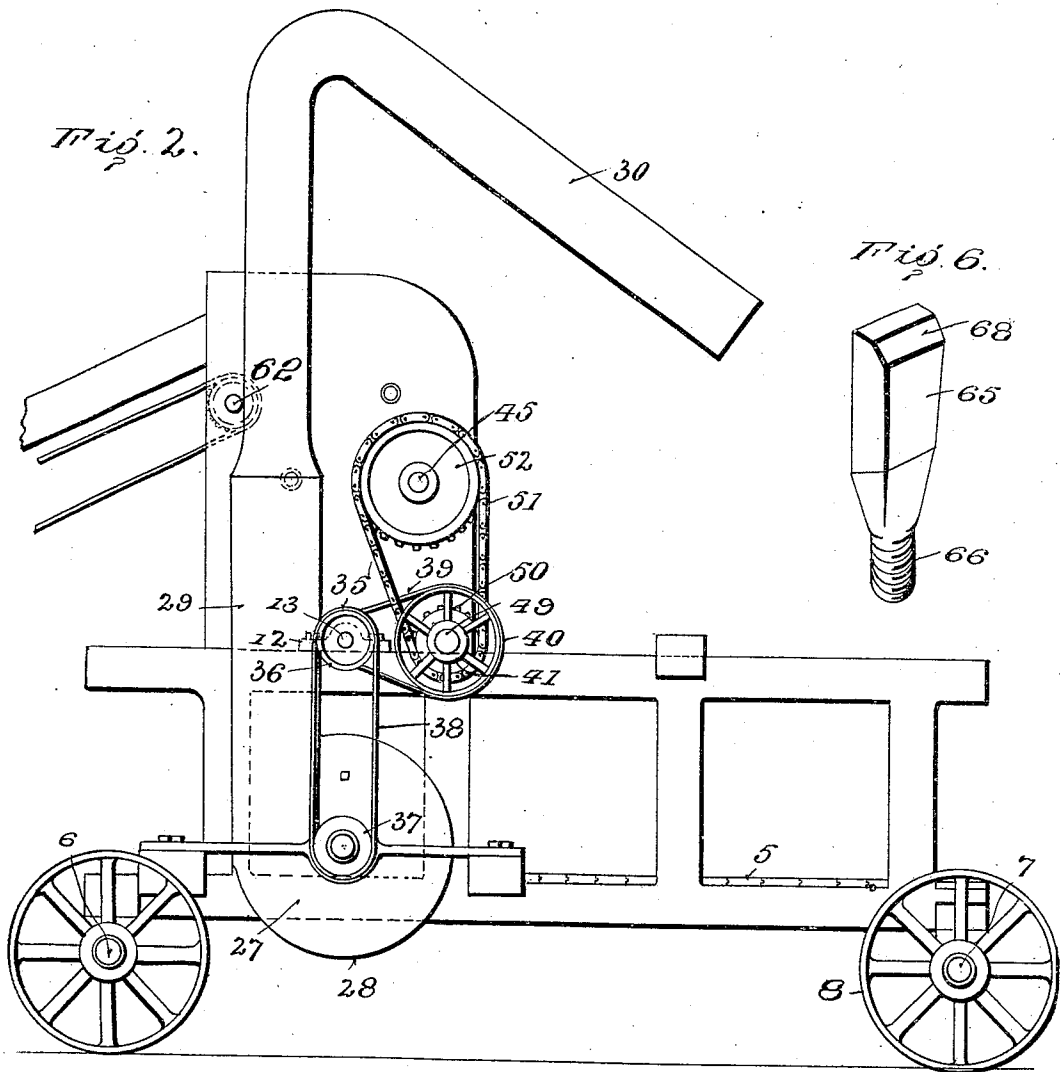


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3 SHEETS—SHEET 2.



Witnesses

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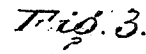
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954,540.

3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

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## HAY-GRINDING MACHINE.

954,540.

Specification of Letters Patent.

Patented Apr. 12, 1910.

Application filed May 18, 1909. Serial No. 496,765.

*To all whom it may concern:*

Be it known that I, DANIEL PRILLIMAN, citizen of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Hay-Grinding Machines, of which the following is a specification.

This invention relates to grinding machines and more particularly to a machine especially designed for grinding hay, straw and similar material.

The object of the invention is to provide a strong, durable and thoroughly efficient machine of the character described, the grinding mechanism of which is mounted on a portable frame or truck so that the latter may be readily transported from place to place.

A further object is to provide a portable grinding machine including a revolving cylinder and concave formed in sections and capable of being adjusted laterally with respect to the cylinder to meet the different conditions of the raw material to be ground, and also to permit the material to be ground either coarse or fine, as desired.

A further object is to form the pivoted concave sections with seating grooves for the reception of removable screen sections, and further to provide the grinding teeth of the cylinder with a plurality of angular faces co-acting with the screen sections to facilitate the grinding operation.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability, and efficiency.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions, and minor details of construction may be resorted to within the scope of the appended claims.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a perspective view of a portable hay grinding machine constructed in accordance with my invention, looking at one side of the machine; Fig. 2 is a side

elevation looking at the opposite side of the machine; Fig. 3 is a vertical sectional view; Fig. 4 is a transverse sectional view; Fig. 5 is a perspective view of the concave sections detached from the hopper; Fig. 6 is a perspective view of one of the grinding teeth of the cylinder detached.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The grinding mechanism forming the subject-matter of the present invention, is mounted on a portable frame or truck including a platform 5, to which are secured in any suitable manner, front and rear axles 6 and 7, the latter being provided with ground wheels 8, thereby to permit the machine to be transported from one portion of a field to another.

Interposed between the side members 9 of the truck is a hood or casing 10 having its front portion open to receive the adjacent end of a conveyer 11 of any suitable construction.

Mounted in suitable bearings 12 on the side members 9 of the truck, is a shaft 13 carrying a grinding cylinder 14, there being front and rear plates 15 interposed between the side walls of the hood or casing 10 and having their upper portions deflected laterally for guiding hay, straw or other material to the cylinder. Disposed beneath the cylinder is a concave, preferably formed in two sections 16 and 17, pivotally united at 18 and provided with seating grooves 19 for the reception of removable screen sections 20. The upper ends of the concave sections 16 and 17 are provided with downwardly extending attaching members or lugs 21 having slots 22 formed therein for the reception of bolts or similar fastening devices 23, the latter being extended through the adjacent side walls of a pan or hopper 24, as shown. The side walls of the pan or hopper converge in the direction of the bottom of the truck and are provided with movable sections or doors 25 so that by swinging the doors laterally and downwardly access may be had to the interior of the pan for the purpose of removing the screen sections 20, when necessary. Extending transversely across the bottom of the pan or hopper, is a screw conveyer 26 which re-

ceives the ground hay or straw from the cylinder 14 and delivers the same to a suitable fan or blower 27 mounted for rotation on one side of the truck.

5 Connected with the fan casing 28 is a conductor 29 having a terminal spout 30 through which the product is directed into a bag or other suitable receptacle mounted on the platform 5 at the rear end of the truck. If desired however, the fan 27 and  
10 conductor 29 may be dispensed with and a conveyer of any suitable construction substituted instead.

The shaft 13 is projected longitudinally beyond the adjacent sides of the truck and secured to one of the projecting ends of said shaft, is a wheel or pulley 31 which may be connected with a traction engine or other suitable source of power for the purpose of transmitting motion to the revolving cylinder and its associated parts.  
20

Secured to the projecting end of the shaft 13 in advance of the pulley 31, is a relatively small wheel or pulley 32 which is connected through the medium of a belt 33 with a relatively large wheel or pulley 34 carried by one end of the screw conveyer 26 so that when the cylinder is rotated a corresponding rotary movement will be imparted to the conveyer 26 for the purpose of delivering the ground hay or straw to the fan, in the manner before stated. Secured to the opposite projecting end of the shaft 13, are spaced wheels or pulleys 35 and 36, one of which is connected to a pulley 37 on the fan shaft by means of a belt 38, while the other wheel 35 is connected through the medium of a similar belt 39 with a balance wheel 40, the latter being provided with a governor 41 of any approved construction.  
35

Journaled in the side walls of the hood or casing 10, is a shaft 42 carrying a retarder 43, the latter being in the form of a plurality of disks or plates having laterally curved peripheral teeth 44 which intermesh with corresponding teeth of an auxiliary retarder 45 carried by a transverse shaft 46 journaled in the side walls of the hood 10 beneath the retarder 43 as shown, there being a similar auxiliary retarder 47 carried by a transverse shaft 48 and arranged below and slightly in advance of the inner end of the conveyer 11 for the purpose of controlling the delivery of the straw or hay to the threshing cylinder.  
45

Secured to the shaft 49 of the balance wheel 40 is a sprocket wheel 50 which engages a sprocket chain 51 traveling over a sprocket wheel 52 on the adjacent end of the auxiliary retarder shaft 45, the other end of the shaft 45 being provided with a pinion 53 which meshes with a master gear 54 carried by a stub shaft 55. Secured to the stub shaft 55 near the master gear 54 is a sprocket wheel 56 which receives a sprocket chain  
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57, the latter being adapted to engage the teeth of a sprocket wheel 58 secured to the projecting end of the shaft 42, as shown.

One end of the auxiliary retarder shaft 48 is projected laterally beyond the adjacent side of the hood or casing 10 and is provided with a pinion or gear 59 which meshes with the master gear 54 so that motion may be transmitted from one retarder shaft to the other.  
70

Secured to the projecting end of the retarder shaft 48 is a sprocket wheel 60 which is operatively connected with a similar sprocket wheel 61 on the conveyer shaft 62 through the medium of a sprocket chain 63, thereby to transmit motion to the conveyer 11. Thus it will be seen that when the machine is connected with a traction engine or any other suitable source of power, motion will be transmitted from one side of the cylinder shaft 13 to the conveyer 26 and from the other side of the conveyer shaft to the balance wheel 40 and through the medium of the sprocket chain 51 and the gearing before described, to the retarding devices and conveyer 11.  
85

Extending longitudinally of the cylinder 14, are a plurality of spaced bars 64 carrying the grinding teeth or fingers 65, the latter being provided with threaded shanks 66 which extend through the adjacent bars and are secured in position thereon by suitable nuts 67. The active ends of the pins or fingers 65 are inclined or beveled at 68 to form a plurality of angularly disposed grinding surfaces which co-act with the screen sections of the concave, thereby to materially increase the grinding action of the machine and render the device thoroughly efficient in operation.  
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The lower ends of the front and rear plates 15 are provided with laterally extending flanges 69 which register with corresponding flanges formed on the door sections 25 of the pan or hopper 24 to permit the insertion of bolts or similar fastening devices 70, thereby to clamp the pivoted sections 25 in engagement with the spaced plates of the hood or casing 10.  
95

One end of the pivot pin 18 of the sectional concave may be extended laterally through a suitable opening in the casing and is provided with an angular terminal for the reception of a wrench or other suitable tool so that when the bolts 23 are loosened the pivoted sections 16 and 17 of the concave may be adjusted laterally with respect to the cylinder 14 to accommodate different kinds of material and also to regulate the grinding action, that is to say, to permit the material to be ground either fine or coarse as desired.  
100

In order to remove the sectional screens 20 to clean the same or to effect any necessary repairs thereto, the fastening devices  
105

70 are released and the pivoted doors or closures 25 swung laterally and downwardly to open position, after which the fasteners 23 are loosened and the free ends of the sections 16 and 17 are swung outwardly a distance equal to the length of the slots 22, and in which position the removable sections 20 may be readily withdrawn from the guiding grooves 19. After the screen sections 20 have been cleaned or repaired, as the case may be, the same are again inserted in the guiding grooves 19 and the sections 16 and 17 swung laterally and upwardly until the open end of the grooves 19 bear against the flanges 69, and in which position the screen sections will be effectually locked against accidental displacement. After the concave sections 16 and 17 have been swung upwardly in the manner described, the bolts 23 are tightened and the door sections 25 moved to closed position and secured in such position by the fastening devices 70.

Thus it will be seen that there is provided a strong and durable machine in which the operating mechanism is compactly arranged on a truck so as to permit the machine to be moved from one place to another.

Having thus described the invention, what is claimed as new is:

1. A grinding machine including a supporting frame, a casing carried by the frame, a grinding cylinder mounted for rotation within the casing, a hopper disposed beneath the grinding cylinder, a concave arranged within the hopper and including pivotally united sections each provided with a guiding groove and having longitudinally slotted lugs adapted to bear against the adjacent walls of the hopper, removable screen sections engaging the seating grooves and forming a part of the concave, fastening devices extending through the slots in the attaching lugs and engaging the adjacent walls of the hopper, and means for feeding material to the cylinder.

2. A grinding machine including a supporting frame, a casing secured to the frame, plates interposed between the side walls of the casing and having their upper ends inclined toward the center of the casing and their lower ends provided with laterally extending flanges, a grinding cylinder mounted for rotation within the casing, a hopper disposed beneath the cylinder and

provided with pivoted sections having laterally extending flanges adapted to register with the flanges on the plates, a concave housed within the hopper and including pivotally united sections having seating grooves formed therein and provided with terminal attaching ears for engagement with the adjacent walls of the casing, and means projecting within the casing for feeding material to the cylinder.

3. A grinding machine including a supporting frame, a casing mounted on the frame and having its front portion open, plates interposed between the side walls of the casing and provided with laterally extending flanges, a grinding cylinder disposed within the casing and mounted for rotation on said supporting frame, a hopper disposed beneath the cylinder and provided with pivoted sections terminating in flanges adapted to register with the flanges of the plates, a concave housed within the hopper and including pivotally united sections having seating grooves formed therein, removable screen sections engaging the grooves and forming a part of the concave, retarding devices mounted for rotation within the casing above the cylinder, a conveyer extending through the open front of the casing, means for rotating the grinding cylinder, and means for transmitting motion from the grinding cylinder to the retarding devices and conveyer respectively.

4. A grinding machine including a supporting frame, a casing secured to the frame, a grinding cylinder mounted for rotation within the casing, a hopper disposed beneath the cylinder, a concave co-acting with the cylinder and including pivotally united sections having seating grooves formed therein and provided with downwardly inclined slotted lugs, fastening devices extending through the slots in the lugs and engaging the walls of the hopper, the pivot of slotted lugs depending from the pivoted ends of the concaved sections, and a pivoted rod extending through the slots in the depending lugs and engaging the hopper.

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

DANIEL PRILLIMAN. [L. s.]

Witnesses:

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W. G. GRAHAM.