

Harvester.

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IMPROVEMENT IN HARVESTERS.

Specification forming part of Letters Patent No. 87,488, dated March 2, 1869; antedated February 20, 1869.

To all whom it may concern:

Be it known that I, JOHN C. HALL, of Monroe, in the county of Green and State of Wisconsin, have invented certain new and useful Improvements in Harvesters; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification, in which—

Figure 1 represents a side view of my improved harvester; Fig. 2, a plan or top view of the same; Fig. 3, a rear view of the rock-shaft which actuates the cutter-bar and its connections; Fig. 4, a view, in elevation, of the cam which moves the rake; and Fig. 5 is a detached view, in perspective, of the rock-shaft and attachment.

In the accompanying drawings, which show a convenient arrangement of parts for carrying out the objects of my invention, A represents the frame of the harvester, which is composed of horizontal members *a a* and diagonals *a' a'*. The axle of the driving-wheel bears on the horizontal pieces, and the diagonals intersect them just beneath it, and, extending backward, are firmly connected to the finger-beam A'.

The driving-wheel B revolves in suitable bearings in the frame, and is provided with triangular cams or projections *b*, arranged in a circle upon its outside.

A horizontal rock-shaft, C, oscillates in bearings *c* upon the frame. It is placed longitudinally upon the machine, and at such a distance from that side of the driving-wheel on which the cams *b* are formed that its center line shall be at one-half their depth, for the purpose of causing the pallets to be presented to the cams at the same angle, insuring regularity to the motions of the cutter-bar, and is bent or recessed for a portion of its length, to enable the cams to pass without striking it.

The rock-shaft C is provided with two vertical arms, C¹ C¹, in which pallets *c¹ c¹* are inserted. The cams *b*, striking against the ends of the pallets, give oscillatory motion to the arms and shaft. The pallets are inserted in holes *c²* in the arms, and have screws upon their ends, being secured in position by the nuts *c³*.

The throw of the rock-shaft can be increased or diminished at pleasure by placing the pallets in the holes farther from or nearer to the center of the rock-shaft. An arm, C², secured upon the rock-shaft, extends downward toward the rear of the machine, and has a rod, C³, pivoted to its lower end. The rod C³, being suitably connected to the cutter-bar D, gives motion to the same by its connection with the rock-shaft.

A spring, *c⁴*, secured to the frame, is connected to the lower end of the arm C², for the purpose of maintaining the arms C¹ C¹ in a vertical position when not acted on by the cams *b*.

The rock-shaft can be moved endwise in its bearings, for the purpose of throwing it into or out of gear, by the rod C⁴, which is connected to a lever, C⁵, pivoted to the frame in advance of the driver's seat, and held in desired position by the catch C⁶. It is to be remarked in addition that the rock-shaft C must be so placed that its center line, when produced, will intersect the axis of the driving-wheel, which insures both the pallets on its arms being presented to the cams on the driving-wheel at the same angle.

Slots in the arms may be substituted for the holes *c²*, if desired, for varying the stroke of the cutter-bar to suit the grain or grass to be cut, the two plans being equivalent and optional. The pallets may be readjusted, to compensate for wear, by placing washers of proper thickness behind the nuts *c³*.

The machine is provided with two castor-wheels, E, which are mounted in bearings E¹, pivoted to the supports E², which are secured to one of the diagonals *a'* of the frame, and to the supplementary framing which supports the outer end of the reel-shaft, or to the divider. A rod, *e*, is hinged to the back of the finger-beam, and has secured upon it two vertical arms, *e¹ e¹*, which have wrists *e²* at their upper ends, sliding in slots *e³ e³* in the supports E². Another vertical arm, *e⁴*, upon the rod *e* has jointed to its upper end a rod, *f*, which extends forward, and is connected to the lower end of a lever, F, pivoted to one of the horizontal members of the frame, near the front thereof, and held in desired position by the notched segment *f'*.

By moving the lever F backward or forward

the cutter-bar and platform are raised or lowered, without altering their relation to the reel and rake, by the connection of the arms $e^1 e^1$ and slots $e^3 e^3$.

A platform, G, is attached to the machine at the rear of the finger-beam.

A reel, H, is mounted upon a shaft, h , in bearings on a post, H^2 , on the main frame, and on the divider H^1 at the outer end of the finger-beam. It is rotated by a band from the pulley b' on the driving-axle, passing over the pulley h^1 on the reel-shaft, and is furnished with suitable beaters h^2 .

A rake, I', is attached to a rake-staff, I, which is pivoted to the reel-shaft by the jointed links i^1 , and passes through the said shaft, a ball-and-socket joint, i^2 , being provided at its intersection therewith.

The movement of the rake I which sweeps the grain from the platform is produced by causing the opposite end of its staff to work in a stationary cam, J, of peculiar construction. This cam is secured to the post H^2 , which carries the driving-wheel end of the reel-shaft in such manner as to have that part of its circumference which is in the rear of the reel-shaft concentric therewith, and its forward part in angular or V form, the point thereof being at a greater distance from the center of the reel-shaft than the radius of the concentric portion of the cam, and inclined toward the grain side of the machine, as well as slightly upward.

A flange or guard, j , extends around the periphery of the stationary cam, against which a friction-roller on the end of the rake-staff bears, and has its motion directed thereby.

A triangular guide, K, is pivoted in the forward angular portion of the cam near its apex. The outer surfaces of the inclined sides of this guide constitute the inner walls of an eccentric groove, of which the flange forms the outer wall.

The curved side of the guide, which is nearest the reel-shaft, is in the form of an arc of a circle concentric therewith, and of the same radius as that part of the flange j which is in the rear of the reel-shaft.

During the time that the roller on the end of the rake-staff is passing between the surfaces of the flange and guide, it receives such direction as gives the raking motion which sweeps the grain from the platform, and when in contact with the back or curved portion of the guide K, or with that portion of the flange j which is in the rear of the reel-shaft, it rotates concentrically therewith, and the movement of the rake is similar to that of the beaters h^2 .

The guide K is pivoted to the cam in such manner that its lower point presses against the lower surface of the flange j , so that the end of the rake-staff cannot enter the eccentric groove when the machine is backed, thereby causing the rake in such cases to move as a beater, and preventing it from throwing

the cut grain from the platform back into the standing grain.

An arm, k , is secured to the guide K, which is connected by the rod k' with the foot-lever L, placed in convenient position to be operated by the driver. By pressing upon this lever the guide K is tilted upward until it closes the opening of the eccentric groove on the upper side of the cam J, and causes the rake to rotate in the manner of a beater, and without raking movement.

The horizontal members of the frame support the driving-wheel and other parts of the machinery, and the diagonal pieces brace and bind the frame together, and afford points of attachment for the finger-beam and parts connected therewith.

The driver's seat M is attached to the front ends of the main diagonal pieces, and can thus be elevated above the driving-wheel, and the whole arrangement forms a strong and compact as well as simple and inexpensive frame.

This construction enables a large driving-wheel (say, four feet in diameter) to be used, and the cutter-bar to be attached close to the rear thereof, while the team can be attached very near the front of the driving-wheel. The parts are so balanced and arranged about the driving-wheel as to afford great facility in turning and operating the machine.

The operation of the harvester is as follows: Motion being communicated by the team, the cams b on the driving-wheel, striking the pallet c^1 on the rock-arms, impart an oscillatory motion to the rock-shaft C, which, by means of the arm C^2 and rod C^3 , communicates the necessary reciprocating movement to the cutter-bar D, the range of this movement being regulated, as before explained, by the holes in the arms C^1 . The reel-shaft and reel are rotated by means of the pulleys b' and h^1 , and the rake-staff revolves with them, receiving the proper motion for raking the grain from the platform by the action of the eccentric portions of the cam J and guide K upon its end.

Having thus fully described my improved harvester, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The rock-shaft C, arranged radially to the driving-axle, and recessed or bent for a portion of its length, so that its axis of rotation shall be at a distance from the side of the driving-wheel on which the cams are placed equal to one-half the depth of the cams.

2. The combination of the rock-arms $C^1 C^1$, either slotted or having a number of holes therein, with the adjustable pallets $c^1 c^1$ and nuts $c^3 c^3$, substantially as described.

3. The slotted caster-wheel supports E^2 , hinged rod e , and arms $e^1 e^4$, for raising and lowering the finger-beam and cutter-bar, as set forth.

4. The combination of the stationary cam J and pivoted guide K, when arranged and operating as and for the purpose set forth.

5. Connecting the reel-shaft and rake-shaft by the ball-and-socket joint *i*² in the reel-shaft and the jointed links, as set forth.

6. The combination and arrangement of the horizontal pieces *a a* and diagonal pieces *a'* *a'*, when the driver's seat is attached to the latter, whereby the seat can be elevated above the driving-wheel, as set forth.

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

JOHN C. HALL.

Witnesses:

LEWIS ROTE,
JAMES BINTLIFF.