J. F. CARTER.

COTTON CHOPPER.

APPLICATION FILED DEC. 10, 1910.

989,115.

Patented Apr. 11, 1911.

2 SHEETS—SHEET 1.

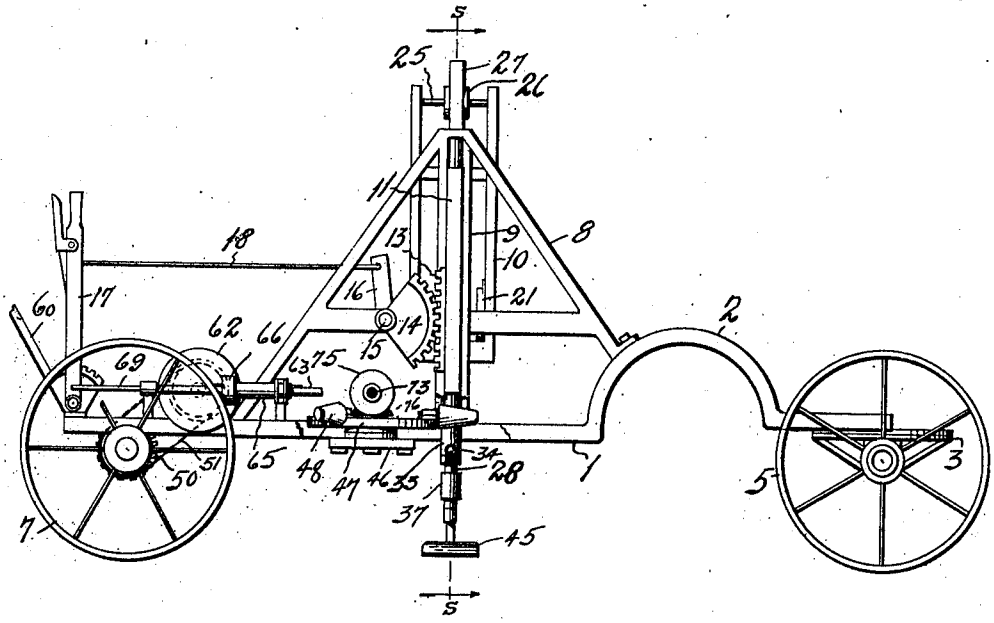

Fig. 1.

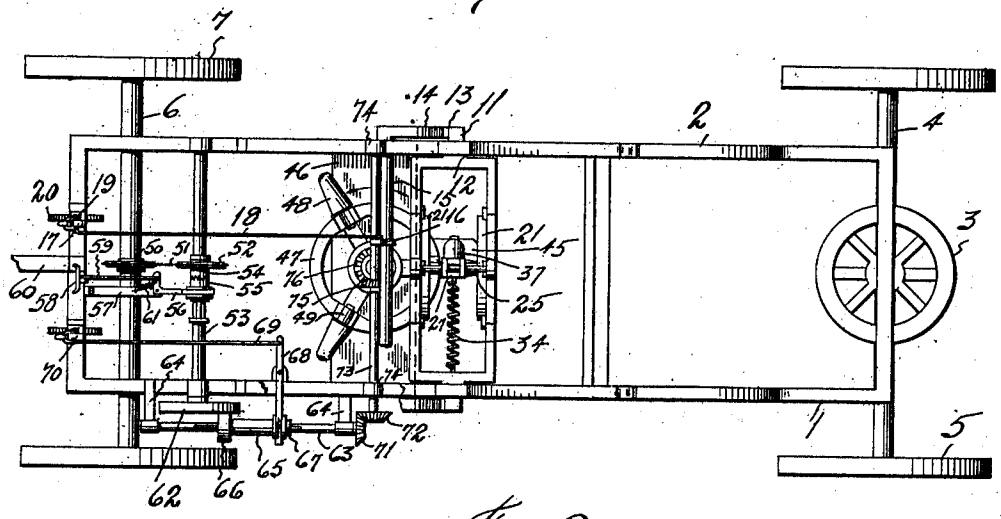

Fig. 2.

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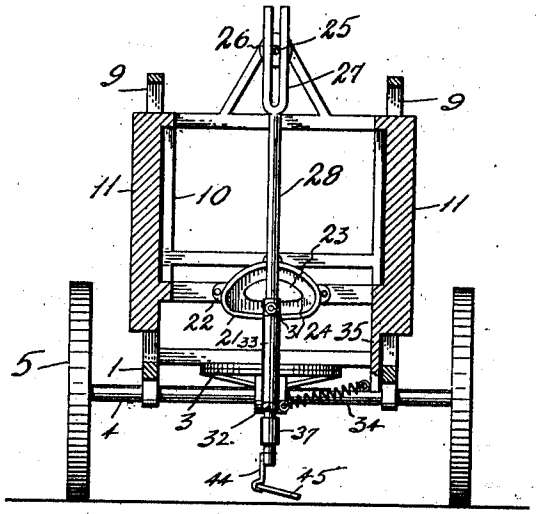

Fig. 3.

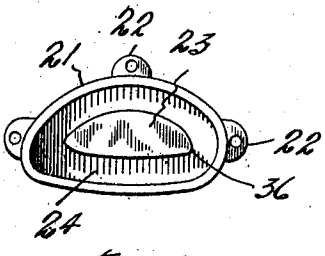

Fig. 4.

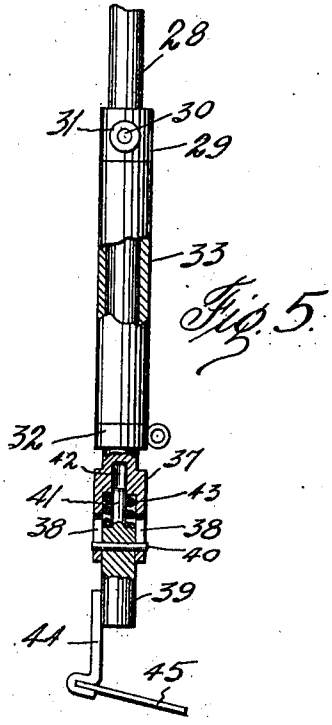

Fig. 5.

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UNITED STATES PATENT OFFICE.

JAMES F. CARTER, OF CEDAR HILL, TEXAS.

COTTON-CHOPPER.

989,115. Specification of Letters Patent. Patented Apr. 11, 1911.

Application filed December 10, 1910. Serial No. 596,576.

To all whom it may concern:

Be it known that I, JAMES F. CARTER, citizen of the United States, residing at Cedar Hill, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Cotton-Choppers, of which the following is a specification.

This invention pertains to cotton choppers.

The object of the invention is to provide a hoe supported in a frame for movement transversely of the row and a particular mechanism for swinging the hoe, together with an adjustment for the depth of the cut of the hoe, a variable speed transmission gearing and other novel features.

Finally the object of the invention is to provide means of the character described that will be strong, durable, efficient, and easy of operation, simple and comparatively inexpensive to construct, and also in which the several parts will not be likely to get out of working order.

With the above and other objects in view, the invention has relation to certain novel features of construction and operation, an example of which is described in this specification and illustrated in the accompanying drawings, wherein:

Figure 1. is a side elevation with portions broken away to expose interior constructions, Fig. 2. is a plan view, Fig. 3. is a transverse vertical sectional view on the line S—S of Fig. 1, Fig. 4. is a detail in elevation of one of the cam plates, and Fig. 5. is a detail in elevation of the hoe.

In the drawings the numeral 1 designates a rectangular frame which is arched at 2 near its forward end to permit the front wheels to swing thereunder in making short turns. The frame is supported at its forward end on a turning gear 3 fixed on an axle 4 which is supported in ground wheels 5. At the rear end the frame is mounted on a revolving axle 5 having ground wheels 7 fixed on its ends.

At each side of the frame a vertical standard 8 is secured. Each standard has a vertical slotted guide 9 secured at its lower end to the frame 1. These guides are opposed and slightly in rear of the transverse center of the frame. Between the standards a hoe frame 10 is mounted. This frame is rectangular in plan and in elevation and extends transversely of the frame 1.

At the center of each end of the frame 10 a vertical shoe 11 is provided. These shoes each have a shouldered portion 12 bearing against or adjacent the guides 9 to limit the lateral movement of the frame 10. The shoes extend through and beyond the guides and are somewhat shorter whereby a vertical adjustment of the hoe frame may be had.

On the rear side of the projecting portion of each shoe a gear bar 13 is provided. These bars are engaged by segmental gears 14 fixed on the ends of an adjusting shaft 15 supported in the standards. Near the center of the shaft a lever 16 is fastened which has connection at its upper end with an adjusting lever 17 by a rod 18. The lever 17 is supported on the rear end of the frame 1 and is provided with a spring pressed plunger 19 engaging a segment 20. By swinging the adjusting lever the shaft 15 is rocked and the segmental gears 14 swung. The gears swinging into and out of the teeth of the bars 13 raise and lower the same, the hoe frame thus being adjusted vertically. The gears when locked by the locking of the lever 17 hold the hoe frame in position.

Within the frame 10 and on opposite sides cam plates 21 are fastened by means of ears 22. These plates extend vertically and transversely of the main frame 1. Each cam plate has a cam 23 at its center surrounded by a guide way 24. At the upper end of the hoe frame a bar 25 is supported longitudially of the main frame and carries a pair of fixed collars 26 spaced apart. The upper forked end 27 of a hoe shaft 28 engages about the bar between the collars and while free to move vertically is held against lateral displacement.

On the hoe shaft a collar 29 is fixed and has oppositely directed trunnions 30 carrying on their free ends, rollers 31. The rollers 31 travel in the guide ways 24 about the cams 23. Below the collar 29 another collar 32 is fixed on the hoe shaft and between the collars a sleeve 33 is rotatably confined on the hoe shaft as is best shown in Figs. 3 and 5. The lower end of a coil spring 34 is secured to the collar 32, while the upper end is attached to an arm 35 depending from the hoe frame 10 within the main frame 1 and on the right hand side with relation to Fig. 3. This spring is employed to swing the hoe shaft across the row during the chopping operation and is normally inclined upward so as to have a tendency to pull the

rollers 31 up and past the point 36 of each cam at the end of the stroke so that the returning mechanism when engaging the hoe shaft will cause the rollers to travel in the upper half of the guide ways during the return movement. The center of the curve opposite the point 36 of each guide way is above said point and the rollers will be drawn to this central point at the end of the chopping stroke. The lower half of each guide way 24 is comparatively straight while the upper half is curved to cause the hoe shaft to be raised and lowered during its return movement or swing across the row.

Below the collar 32 a hanger 37 provided with opposed vertical slots 38 is fixed on the lower end of the hoe shaft as best shown in Fig. 5. Within the hanger a plunger 39 is slidable. This plunger has a transverse pin 40 engaging in the slots 38 and carries on its upper end a central stem 41 projecting into a recess 42 in the hanger. A coil spring 43 surrounds the stem within the hanger and bears on the upper end of the plunger. It is apparent that the plunger is resiliently held and is free to yield upward. On the lower end of the plunger a bracket 44 is secured. This bracket depends from the lower end of the plunger and carries a hoe blade 45 at the proper angle.

For returning the hoe shaft a plate 46 is disposed transversely of the frame 1 and secured to the underside thereof. At the center of the plate a horizontal wheel 47 is suitably mounted to rotate. A plurality of equally spaced conical rollers 48 are mounted horizontally in bearing boxes 49 on the upper side of the wheel. These rollers project from the periphery of the wheel and have their larger ends adjacent thereto. The hoe shaft swings in the path of the conical rollers. Suitable mechanism hereinafter described is provided for rotating the wheel 47 in the direction of the arrow shown in Fig. 2. The hoe shaft at the extreme end of its stroke after completing the chopping operation stands with its sleeve 33 in the path of the rollers 48. As the wheel 47 is rotated one of its rollers engages the sleeve 33 and swings the hoe shaft to the left with relation to Fig. 3. During this return movement the rollers 31 travel in the upper half of the guide ways 24 whereby the hoe is raised and lowered as it is swung across the row. The conical rollers engaging the rotating sleeve will reduce friction and will have a tendency to raise the hoe shaft during the first half of its return movement during which the surface of the roller will have various points in engagement with the sleeve from the smaller outer end of the roller to its larger inner end. As the roller is conical and swings in the arc of a circle at right angles to the arc of a circle in which the hoe shaft swings, the line of contact of the sleeve against the roller will be in the form of a helix and the sleeve will reach the highest point on the roller at about the center of the return stroke.

It is apparent that when the hoe shaft is returned the spring 34 will be extended and the weight of the hoe shaft will cause the rollers 31 to readily drop off of the end of the cam 23 into the lower half of the guide ways so that just as soon as the roller rides off of the sleeve the spring will swing the hoe shaft across the row and carry out the chopping operation. The ends of the rollers 48 are rounded so that they will readily ride off of the sleeve and sufficient space is provided at the left hand end of the guide ways with relation to Figs. 3 and 4 to permit the rollers 31 to ride off of the ends of the cams just prior to the disengagement of the rollers 48 from the sleeve 33.

For rotating the wheel 47 the following driving mechanism is employed: On the rear axle 6 a sprocket 50 is fixed. This sprocket drives a chain 51 and a similar sprocket 52 loose on a transverse shaft 53 supported on the frame 1 forward of the axle 6. The sprocket 52 has a clutch hub 54 with which a clutch sleeve 55 splined on the shaft is adapted to engage. A bell-crank lever 56 pivoted on a bracket 57 extending from the rear end of the frame 1, has forked engagement with the sleeve 55. From the free end of the lever a rod 59 extends and has connection with a foot lever 58 pivoted on the main frame. A seat standard 60 is also secured on the rear end of the main frame adjacent the foot lever. By pressing the foot lever forward the clutch sleeve 55 is thrown out of engagement with the clutch hub 54 and the transmission of motion to the shaft 53 interrupted. When pressure is relieved on the foot lever a coil spring 61 extending from the bracket 57 to the lever 56 will throw the clutch into engagement.

One end of the shaft 53 projects over the side of the frame 1 and has fixed thereon, a friction disk 62. A transmission shaft 63 is supported at the side of the frame parallel thereto in brackets 64 fastened on the frame. A sleeve 65 is splined on this shaft and carries a friction pinion 66 on one end, while a grooved collar 67 is provided on the other end. The pinion has its face in engagement with the side of the disk. A lever 68 pivoted on the frame has one end forked and engaging the grooved collar, while the other end extends inward and has connection by a rod 69 with an adjusting lever 70 mounted on the rear end of the main frame. By swinging the adjusting lever 70 the pinion 66 is moved along the side of the disk toward and from the center of the same, a variable transmission gearing being thus provided.

On the forward end of the shaft 63 a miter gear 71 is fixed. This gear meshes

with a similar gear 72 fixed on the end of a transverse shaft 73. The shaft 73 is supported in bearing brackets 74 mounted on the frame 1 and extends over and above the wheel 47. A miter gear 75 is fixed on the shaft 73 and meshes with a similar gear secured on the wheel 47.

It is obvious that the speed of rotation of the wheel 47 and the operation of the hoe shaft may be varied by adjusting the transmission gearing. The forward end of the main frame is open and there is practically nothing to prevent the operator having an unobstructed view of the row in advance of the hoe. If the "stand" should be thin and it is not desired to chop out the plants at intervals, the operator merely presses the foot lever 58 forward and interrupts the transmission of motion to the shaft 53 and the wheel 47. It will be noted that when the hoe is not in operation the spring 34 holds it to one side so that the blade 45 will not strike the plants.

What I claim is:

1. In a cotton chopper, the combination with a main frame mounted on ground wheels and having a driving axle, of a transverse hoe frame adjustable in the main frame, a hoe shaft mounted in the hoe frame, cam plates having guide-ways and mounted in the hoe frame, rollers supported on the shaft engaging in the guide-ways, a blade mounted on the lower end of the shaft, a sleeve rotatably confined on the shaft, a horizontal rotatable wheel supported on the main frame, a plurality of rollers projecting from said wheel adapted to engage the sleeve of the shaft, a coil spring having connection with the shaft and the hoe frame, and gearing connections between the driving axle and the horizontal wheel including a variable speed transmission gearing.

2. In a cotton chopper, the combination with a main frame supported on ground wheels and driving mechanism mounted on the frame, a transverse hoe frame adjustable vertically in the main frame, a hoe shaft mounted to swing from its upper end in the hoe frame, a pair of cam plates mounted in the hoe frame, each plate having a guide-way, rollers mounted on the shaft intermediate its ends and engaging in the guide-ways, a coil spring engaging the shaft below the rollers and having connection with the hoe frame for swinging the shaft in one direction, and a rotating device mounted on the main frame adapted to intermittently engage the hoe shaft to swing it in the opposite direction against the tension of the spring, the rotating device having connection with the driving mechanism.

3. In a cotton chopper, the combination with a portable frame and a driving gearing, of a hoe frame adjustably mounted on the portable frame, a bar at the upper end of the hoe frame, a hoe shaft having its upper end forked and embracing the bar, collars on the bar between which the shaft engages, cam plates secured in the hoe frame on opposite sides near its lower end, each plate having a cam surrounded by a guide-way, a sleeve rotatably mounted on the shaft, trunnions extending from the shaft above the sleeve, rollers mounted on the trunnions and engaging in the guide-ways, a coil spring connected to the shaft below the sleeve and fastened to the hoe frame, a resilient connection in the shaft below the sleeve, a hoe blade secured on the shaft below the connection, a horizontal rotatable wheel mounted on the portable frame, and spaced conical rollers mounted on the wheel adapted to engage the sleeve of the hoe shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES F. CARTER.

Witnesses:
W. G. HASWELL,
D. B. SLIGER.