

Dec. 15, 1931.

J. O. B. PALMER

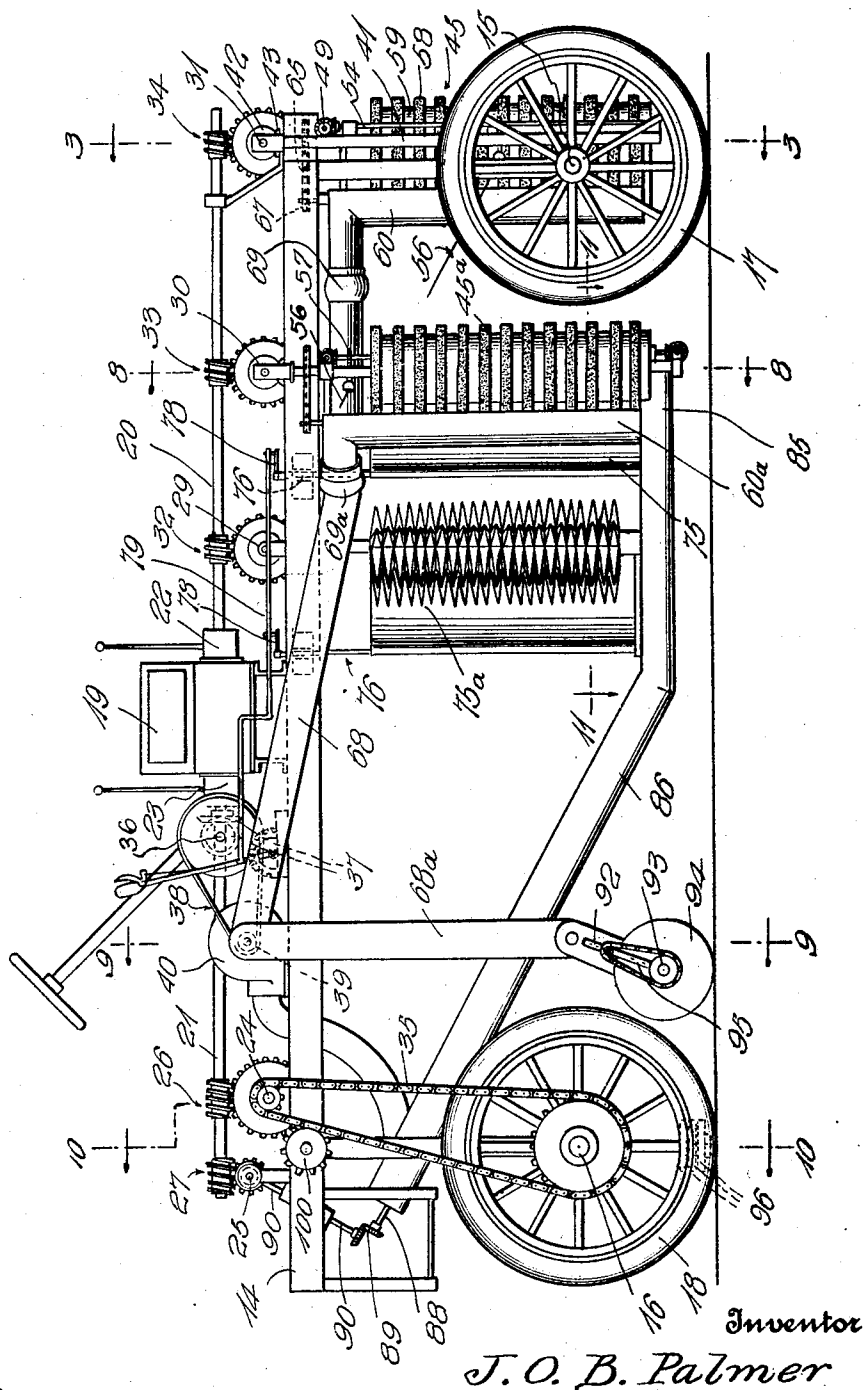
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COTTON PICKING MACHINE

Filed June 20, 1929

8 Sheets-Sheet 1

Fig. 1.



Witness

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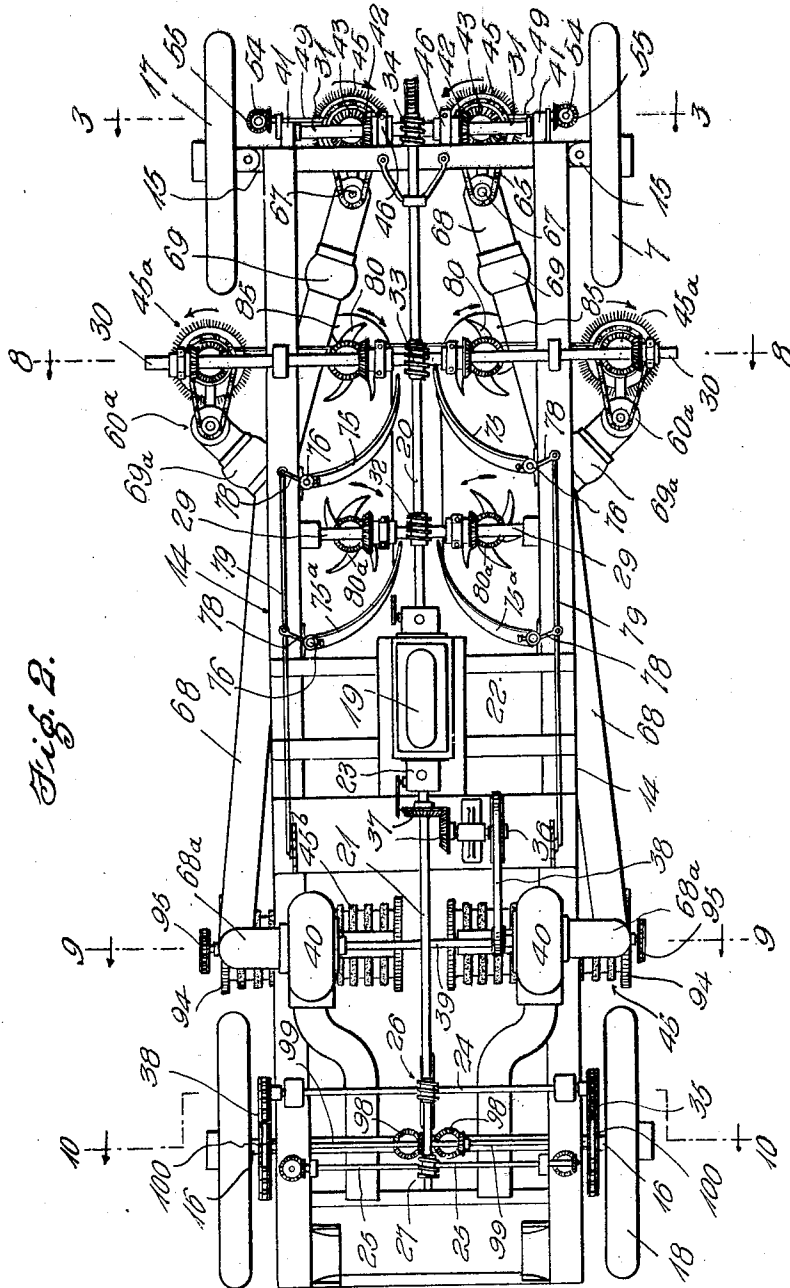


Fig. 2.

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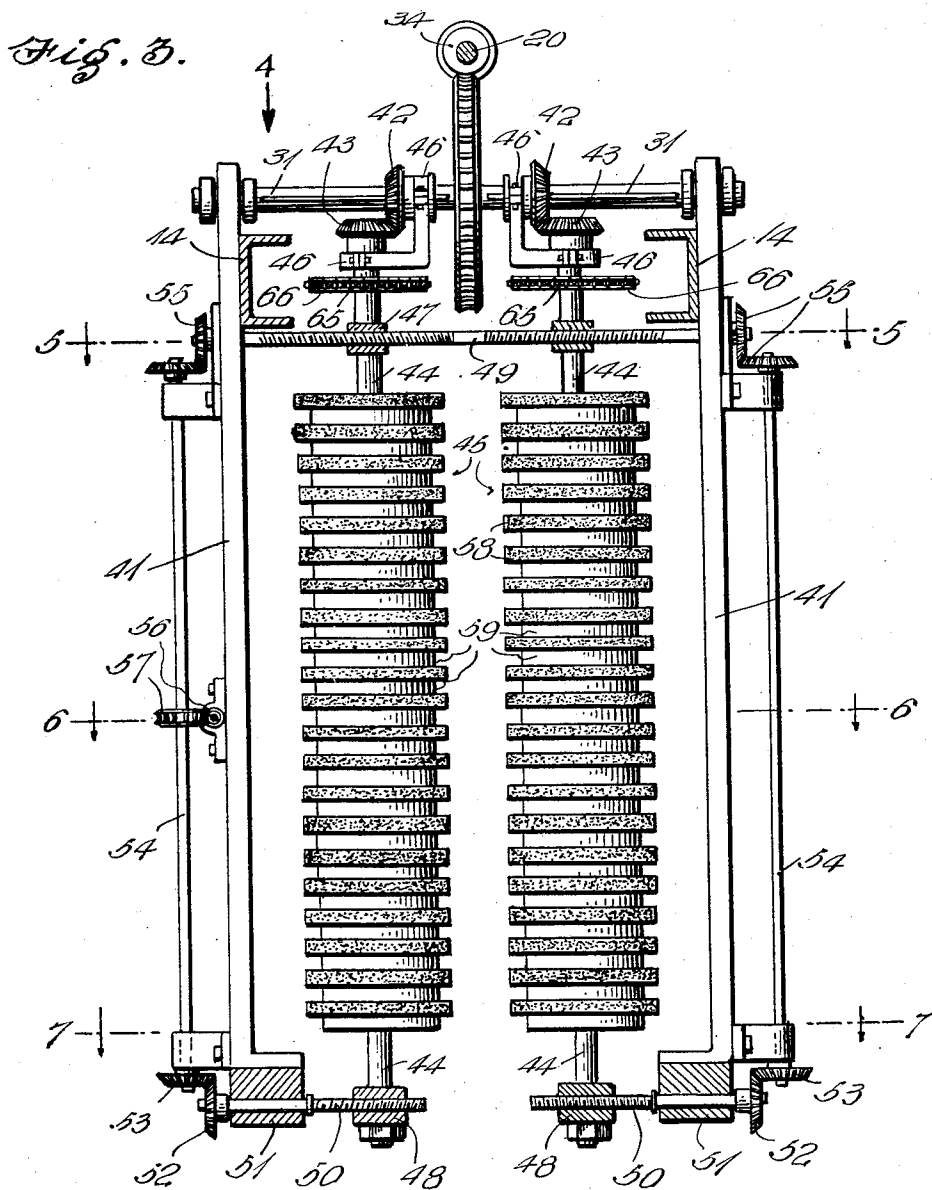
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Filed June 20, 1929

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Fig. 4.

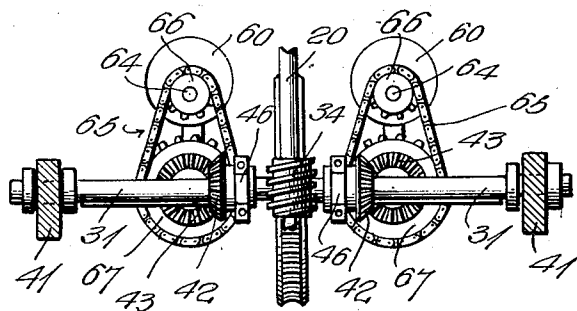


Fig. 5.

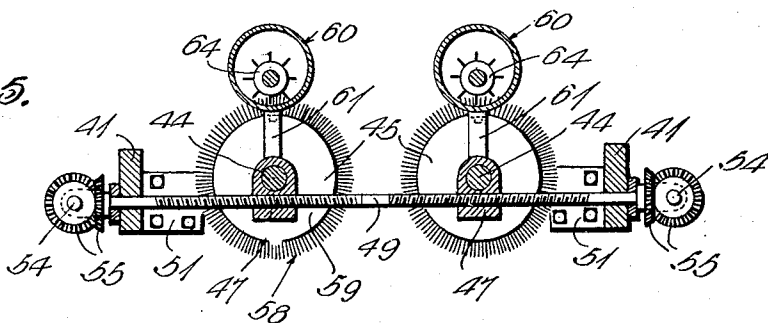


Fig. 6.

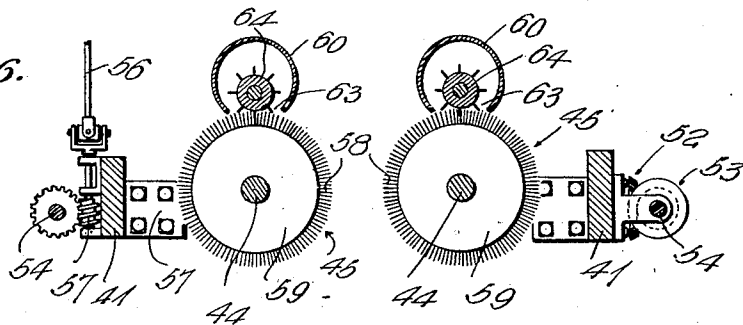
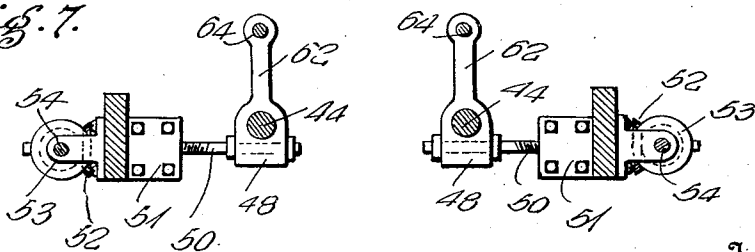


Fig. 7.



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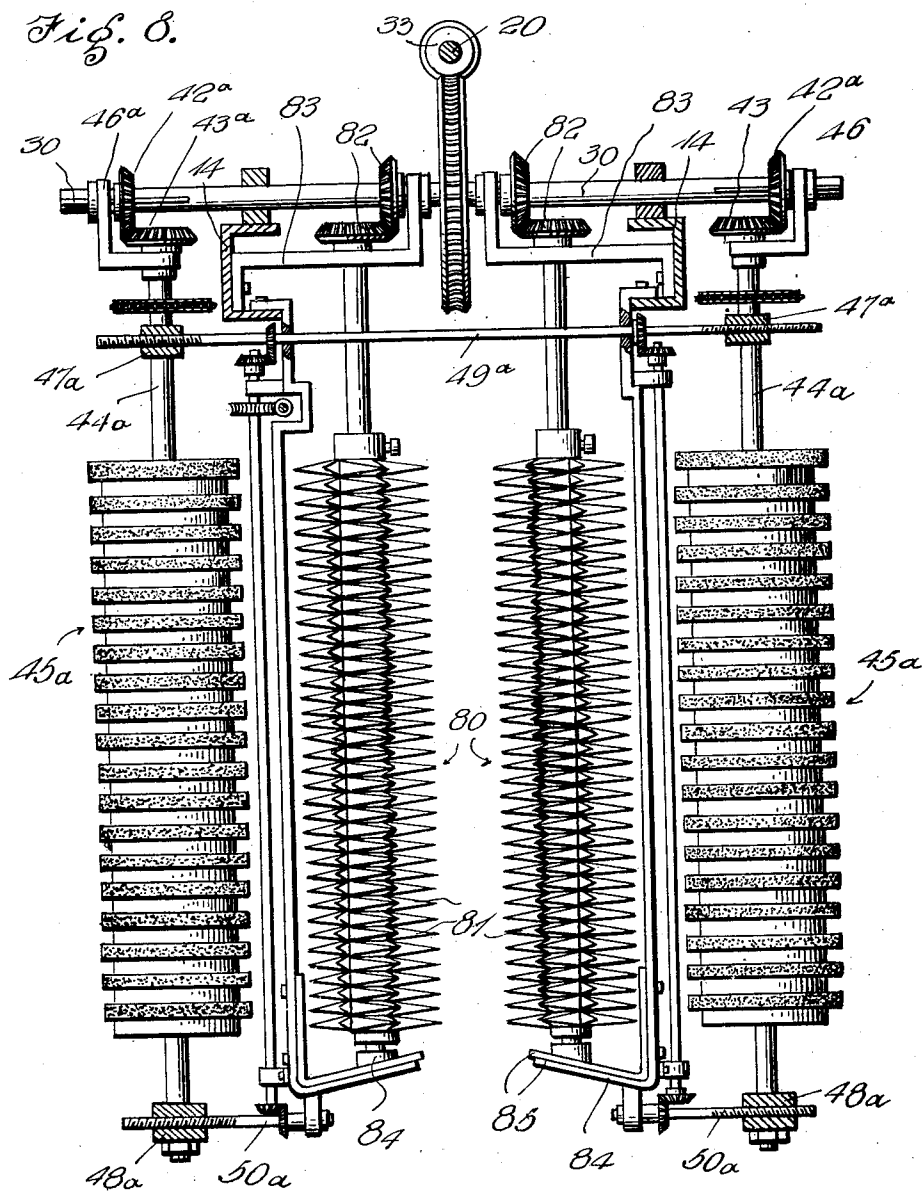
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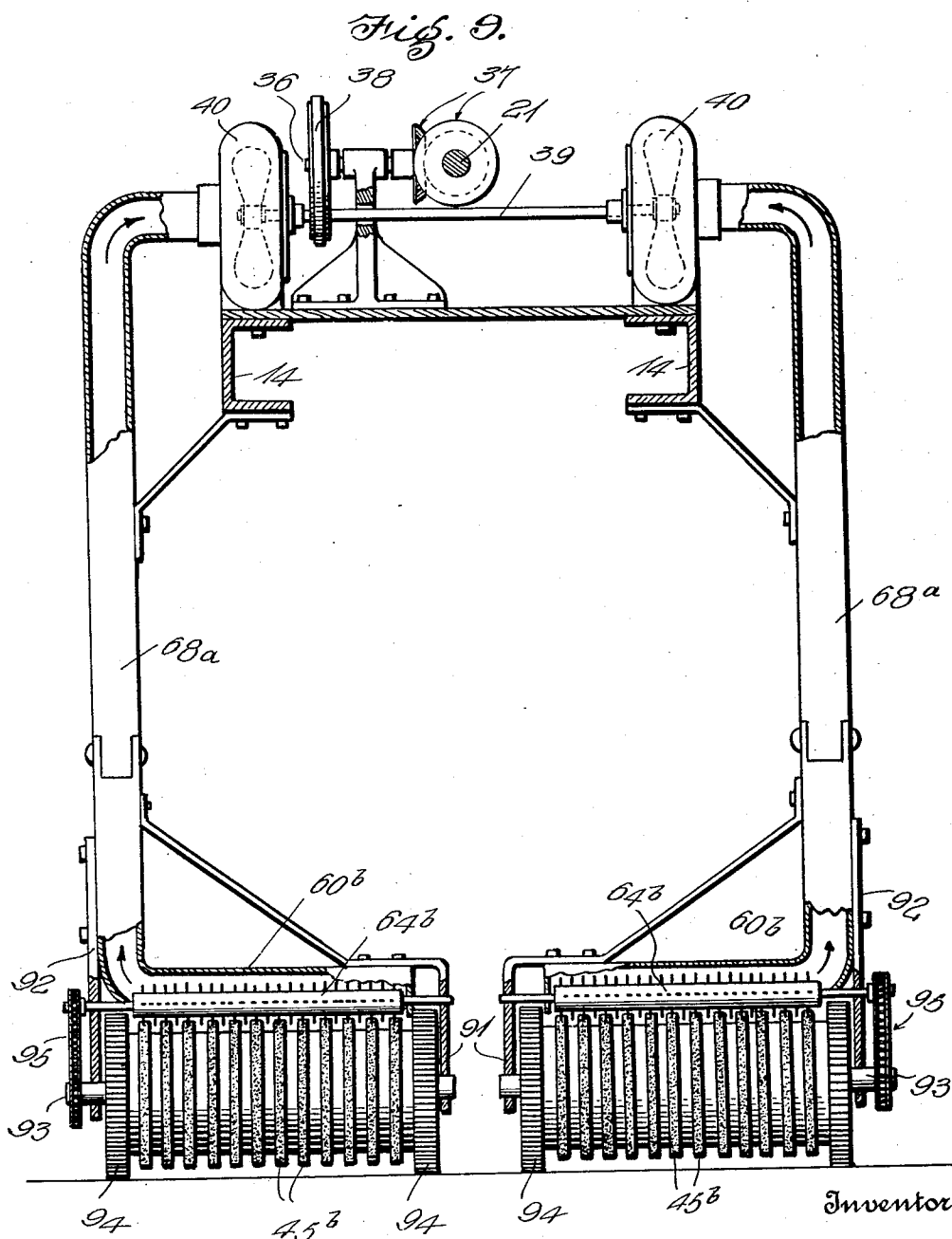
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COTTON PICKING MACHINE

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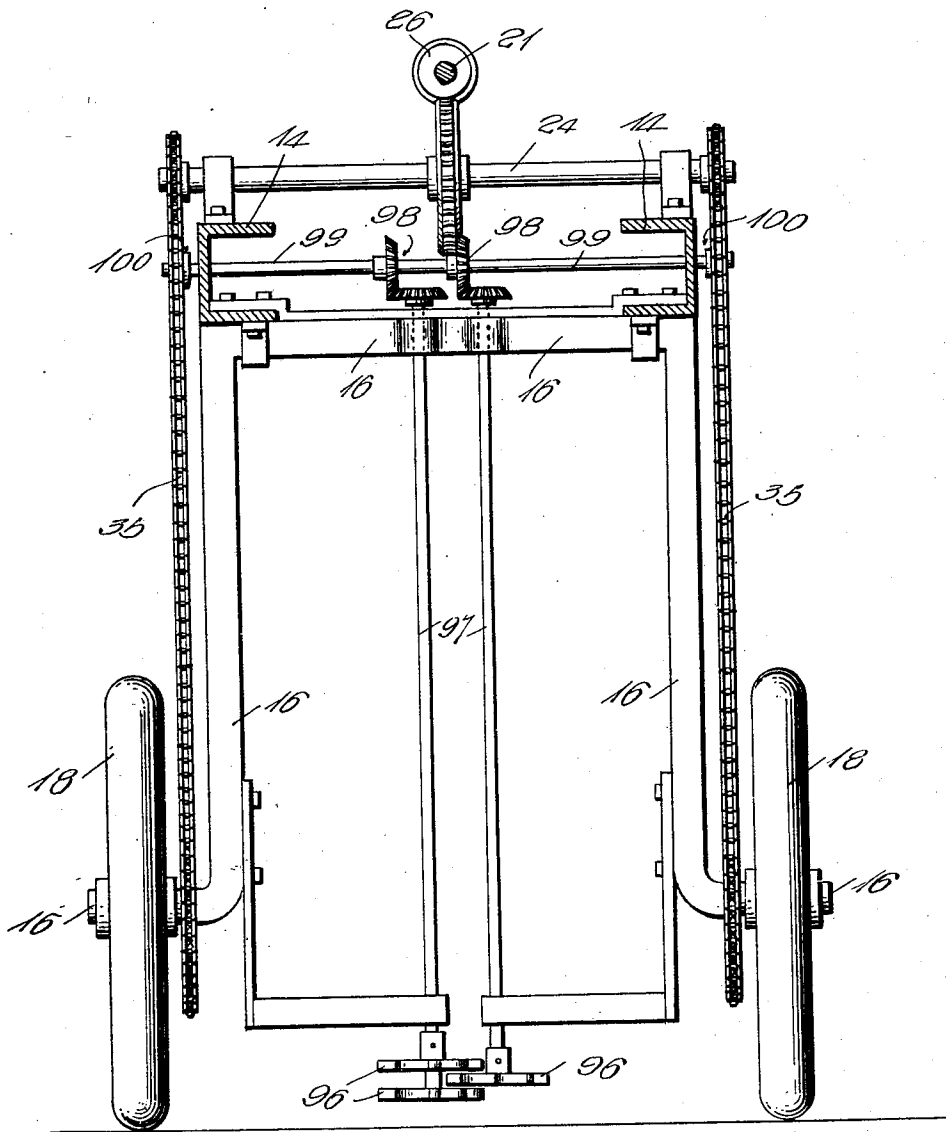
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COTTON PICKING MACHINE

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Fig. 10.



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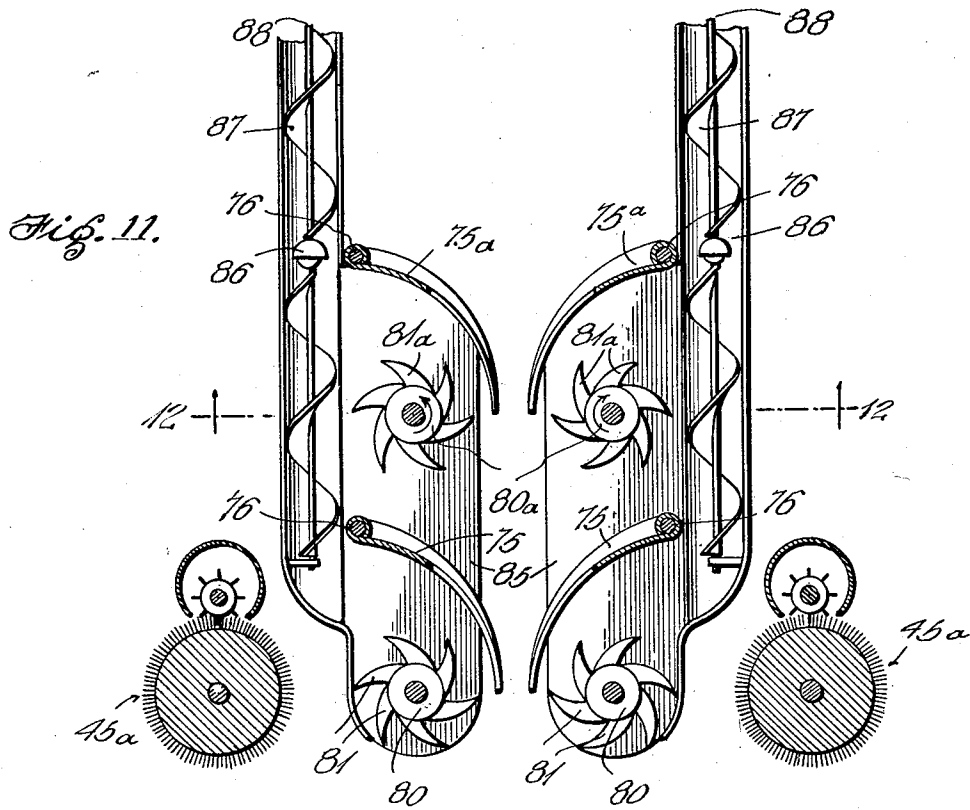
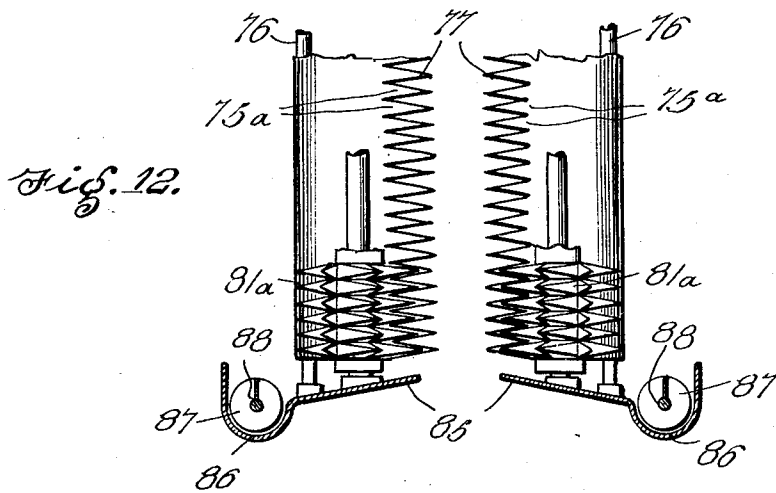
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COTTON PICKING MACHINE

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8 Sheets-Sheet 8



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UNITED STATES PATENT OFFICE

JAMES O. B. PALMER, OF EL PASO, TEXAS

COTTON PICKING MACHINE

Application filed June 20, 1929. Serial No. 372,503.

The invention relates to machines for picking cotton and it is one aim to provide a machine which may be readily converted to first pick all of the full blown cotton and to later pick the cotton from the fully open bolls and also pick the bolls which are not entirely open.

A further aim is to provide a machine which will operate simultaneously upon both sides of a straddled row and one side of the laterally spaced rows, at one trip across the field, it being thus necessary to straddle only the alternate rows, with a consequent saving in time and expense.

Another aim of the invention is to provide a machine which will cut the stalks of the cotton plants near the ground after the cotton and bolls have been picked.

Still further aims are to provide new and improved cotton and boll picking means, novel means for gathering fallen cotton from the ground, unique adjusting means for the pickers, and a generally new and improved organization of elements in which a single motor propels the entire machine and drives various movable parts thereof.

With the foregoing in view, the invention resides in the novel subject matter herein-after described and claimed, description being accomplished by reference to the accompanying drawings.

Fig. 1 is a side elevation showing the general organization of parts.

Fig. 2 is a top plan view.

Fig. 3 is a vertical transverse sectional view on line 3—3 of Figs. 1 and 2.

Fig. 4 is an upper end elevation of the construction shown in Fig. 3, as indicated by the arrow 4 of the latter figure.

Figs. 5, 6 and 7 are horizontal sectional views on the correspondingly numbered lines of Fig. 3.

Fig. 8 is a vertical transverse sectional view on line 8—8 of Figs. 1 and 2.

Fig. 9 is a transverse sectional view on line 9—9 of Figs. 1 and 2.

Fig. 10 is another transverse sectional view on line 10—10 of Figs. 1 and 2.

Fig. 11 is a fragmentary horizontal section as indicated by line 11—11 of Fig. 1.

Fig. 12 is a vertical transverse section partly broken away as indicated by line 12—12 of Fig. 11.

A horizontally elongated frame 14 is shown supported by front and rear arched axles 15—16 having suitable wheels 17—18 respectively. The front wheels are provided with appropriate steering means (not shown) and the rear wheels are driven as hereinafter described.

Mounted upon the frame 14, between the ends of the latter, is a motor 19 for driving a front longitudinal shaft 20 and a rear longitudinal shaft 21, the two shafts being rotatably mounted upon the frame 14 in any desired bearings and being driven respectively by two variable speed transmissions 22—23, said transmissions being operatively connected with the motor 19. Mounted upon the rear portion of the frame 14, are two transverse shafts 24—25 driven by appropriate gearing 26—27 respectively, from the rear longitudinal shaft 21. Three additional transverse shafts 29—30—31 are mounted upon the front portion of frame 14 and are driven by appropriate gearing 32—33—34 respectively, from the shaft 20. The shafts 29—30—31 serve to drive rotary pickers hereinafter described, shaft 24 drives chains 35 for driving the rear wheels 18, and shaft 25 drives boll-conveying means as hereinafter explained. The rear longitudinal shaft 21, in addition to driving the transverse shafts 24—25, drives a short transverse shaft 36 through the instrumentality of gearing 37, and by means of a belt 38 and appropriate pulleys, said shaft 36 drives another transverse shaft 39 which is directly connected to the rotors of two suction fans 40, which fans are instrumental in conveying the picked cotton rearwardly to appropriate containers (not shown).

The front end of the frame 14 is provided with two laterally spaced vertical bars 41 shown in a general way in Figs. 1 and 2 but illustrated primarily in Fig. 3. The transverse shaft 31 is carried by the upper ends of these bars and two bevel pinions 42 are driven by and slidable along this shaft. The pinions 42 mesh with bevel gears 43, said

gears being secured to the upper ends of vertical shafts 44 forming portions of two rotary picking brushes 45. Appropriate yokes 46 hold the gears 42—43 in mesh with each other, whether the brushes 45 be closely spaced or widely spaced, and unique adjusting means are provided for varying the space between said brushes, according to the width of the cotton plants which must pass between them.

Upper and lower bearings 47—48 are shown for the shafts 44 of the brushes 45, a single horizontal screw 49 is supported by bearings carried by the bars 41, for adjusting the bearings 47 toward and from each other, and two relatively short, axially aligned, lower screws 50 are provided for similarly adjusting the bearings 48. Bearings 51 are shown rotatably supporting the screws 50. The outer ends of these screws are provided with beveled gears 52 meshing with similar gears 53 on the lower ends of two vertical shafts 54 which are rotatably mounted at the outer sides of the bars 41. The upper ends of the shafts 54 are similarly connected by beveled gearing 55 with the outer ends of the upper screw 49. Suitable provision is made for driving one of the shafts 54 as desired. For this purpose, a shaft 56 has been shown connected by appropriate gearing 57 with one of the shafts 54, said shaft 56 and gearing 57 being shown in Fig. 3 and indicated in Fig. 1. Driving of this shaft, due to the construction and relation of parts, effects rotation of the upper screw 49 and the lower screws 50, thereby causing them to adjust the bearings 47—48 inwardly or outwardly as may be required, and such bearing adjustment effects either wide or narrow spacing of the brushes 45, as may be required.

Preferably, each brush 45 consists of alternate brush elements 58 and spacers 59, the brush bristles being preferably of steel to cause the cotton ready for picking, to readily catch upon them.

Behind the brushes 45, are two vertically elongated tubes 60 carried by upper and lower bracket arms 61—62 which are suitably joined to the upper and lower bearings 47—48 of the shafts 44. These tubes are provided with longitudinal slots 63 at the peripheries of the brushes 45, and in said tubes, spiked drums 64 are mounted longitudinally. The shafts of these drums are operatively connected at their upper ends by chains 65 and sprockets 66—67, with the brush shafts 44 so that as long as the brushes 45 are driven, the spiked drums 64 will be driven. The brushes roll toward the cotton, pick off all loose cotton therefrom, the spiked drums 64 remove this cotton from the brushes, and suction created in the tubes 60, carries the cotton to the rear of the machine. The tubes 60 are connected with the front ends of two longitudinal suction tubes 68 which communicate with the suction fans 40, flexible joints

or the like 69 being provided near the front ends of said tubes 68 to permit lateral movement of the vertical tubes 60 with the brushes 45 when the latter are adjusted.

The brushes 45 straddle one row and remove the full blown cotton therefrom. Two additional, vertically elongated brushes 45^a (Figs. 1, 2 and 8) are provided, with their cotton-engaging portions spaced laterally outward from the paths of the front and rear wheels 17—18, and these brushes gather the cotton from the inner sides of the two adjacent rows. Behind the brushes 45^a are two brush-cleaning and cotton-conveying assemblies 60^a constructed in the same manner as the groups of parts above described for cleaning cotton from the front brushes 45. The suction tubes of the assemblies 60^a are connected with the suction tubes 68, and flexible coupling or the like 69^a are provided to permit the necessary inward and outward shifting of parts incident to adjusting of the brushes 45^a as may be required. By reference more particularly to Fig. 8, the manner in which these brushes are driven and adjusted will be seen. Bevel gears 42^a are driven by and slidable upon the shaft 30 which is located above the brushes 45^a. These gears 42^a mesh with similar gears 43^a on the upper ends of the brush shafts 44^a. An upper adjusting screw 49^a and two lower adjusting screws 50^a are provided for inwardly and outwardly shifting the upper and lower bearings 47^a—48^a of the shafts 44^a, and the provision for simultaneously driving said screws, is so similar to that above explained for driving the screws 49—50, that further explanation will not be required. When making inward and outward adjustments of the brushes 45^a, yokes 46^a operate in the same manner as the yokes 46, to keep the gears 42^a—43^a in mesh with each other.

A front pair of vertically elongated, forwardly converging boll-gathering plates 75 and a rear pair of similar plates 75^a are provided to engage opposite sides of the row being straddled for the purpose of removing all bolls therefrom. The construction of both pairs of plates and the mounting means thereof are identical and hence these features will be described only in connection with the front plates 75. These plates are seen more particularly in Figs. 11 and 12. Their rear edges are secured to vertical shafts 76 suitably mounted in bearings upon the frame 14, while their front edges are provided with long boll-gathering fingers 77. Suitable means may be provided for turning the shafts 76 to swing the two plates 75 toward or from each other according to the width of the straddled row. In Figs. 1 and 2, I have indicated crank arms 78 on the upper ends of the shafts 76, said arms being connected to longitudinal rods 79. These rods are shown connected with hand levers 79^a provided with appropriate devices

79" by means of which they may be locked in adjusted position.

Somewhat in front of the plates 75—75^a, are vertical rotary drums 80—80^a which are provided with curved boll-gathering fingers 81—81^a respectively. The drums 80 are driven by bevel gearing 82 from the shaft 30, and the rear drums 80^a are similarly driven by means of the shaft 29. Appropriate bearing brackets are provided for the upper ends of the shafts of the drums 80—80^a, an illustration of the brackets for the drums 80 being given at 83 in Fig. 8. The lower ends of the shafts in question may be rotatably mounted in step bearings 84 supported by two outwardly declined receiving platforms or the like 85 upon which the bolls drop from the plates 75—75^a and the drums 80—80^a. These platforms or the like 85 are shown most clearly in Figs. 8, 11 and 12 and the outer portions thereof discharge into longitudinal troughs or other conductors 86 for the cotton bolls. Within these conductors, screw conveyors 87 have been shown. The rear extremities of the conveyor shafts 88 (Fig. 1) are driven by bevel gearing 89 from inclined shafts 90 which are similarly driven by the shafts 25 above described. The bolls discharged from the rear ends of the conductors 86 may be received in suitable containers (not shown).

Novel provision is made for gathering any fallen cotton from the ground without picking up any trash thereon. This provision is shown more particularly in Figs. 1 and 9. From these views, it will be seen that vertical suction tubes 68^a extend downwardly from the fans 40 and have their lower ends turned laterally inward as at 60^b. Within these tube ends 60^b are spiked drums 64^b which correspond with the drums 64 above described, being disposed at longitudinal slots in the lower sides of the tube portions 60^b. Inner and outer bearing brackets 91—92 are shown secured to and projecting downwardly from the tubes 68^a, and in these brackets, axially aligned horizontal shafts 93 are mounted. Each shaft 93 carries a brush 45^b similar to the brushes 45—45^a, and said brushes and shafts are provided also with ground wheels 94 by which they are driven. Chains 95 and sprockets operatively connect the shafts 93 with the shafts of the drums 64^b for driving the latter. As long as the machine is being propelled, the wheels 94 drive the brushes 45^b, at such speed as to cause said brushes to merely roll along the ground causing them to spear and lift any fallen cotton from the ground. By driving the brushes 45^b at such speed as to cause them to merely roll along the ground, while they will effectively spear and lift fallen cotton, they will not brush any dirt upwardly to be drawn into the machine through the horizontal ends 60^b of the suction tubes 68^a. The rotary drums 64^b re-

move the cotton from the brushes, and the suction through the tubes 68^a, removes the cotton from said drums, this cotton being carried on to the fans 40 and discharged with that coming from the brushes 45—45^a.

At the rear of the machine, rotary cutters 96 are provided for the stalks from which all cotton and bolls have been removed. These cutters are carried by the lower ends of vertical shafts 97 which are driven by gearing 98 from a transverse shaft 99, said shaft having sprockets 100 which engage the driving chains 35 of the rear wheels 18.

During the first picking or pickings, the cutters 96 and preferably their driving means also, are removed from the machine. Then too, it is preferable at that time to remove the boll pickers 75—75^a and 80—80^a, using only rotary brushes for the picking operation. If desired, additional brushes such as 45 and 45^a may be then used in place of the drums 80—80^a, but this is not essential. With the machine thus conditioned, it is propelled astride of a row and the inner rotary brushes remove the cotton from this row, while the outer brushes 45^a remove the cotton from the inner sides of two adjacent rows, all of the picked cotton being carried rearwardly by suction and discharged into the containers (not shown). Any cotton falling upon the ground is picked up by the horizontal rotary brushes 45^b and is carried on rearwardly with that coming from the front of the machine.

For later picking, the boll gatherers 75—75^a and 80—80^a are again placed upon the machine and all bolls gathered thereby will fall onto the receivers 85 and from the latter will be carried rearwardly by the conveyors 87. For the final picking, the rotary cutters 96 are installed so that the completely picked plants will be cut from the ground.

The general construction shown and described is preferably followed, but attention is invited to the fact that the present disclosure is for illustrative purposes only and within the scope of the invention as claimed, numerous variations may be made.

I claim:—

1. A cotton picker comprising a horizontal frame, wheels supporting the front and rear ends thereof, a motor mounted on said frame between the front and rear ends thereof, a front and a rear longitudinal shaft mounted on the frame in advance of and behind the motor respectively, front and rear transmissions operatively connecting the front and rear shafts respectively with the motor, rear transverse shafting mounted on the frame behind the motor and operatively connected with said rear longitudinal shaft, front transverse shafting mounted on the frame in advance of the motor and operatively connected with said front longitudinal shaft, cotton picking means carried by the front portion of said frame, driving connections between

the front transverse shafting and said picking means, and driving connections between said rear transverse shafting and the rear wheels of the machine.

2. A cotton picker comprising a horizontal frame, wheels supporting the front and rear ends thereof, a motor mounted on said frame between the front and rear ends thereof, a front and a rear longitudinal shaft mounted on the frame in advance of and behind the motor respectively, front and rear transmissions operatively connecting the front and rear shafts respectively with the motor, rear transverse shafting mounted on the frame behind the motor and operatively connected with said rear longitudinal shaft, front transverse shafting mounted on the frame in advance of the motor and operatively connected with said front longitudinal shaft, cotton picking means carried by the front portion of said frame, driving connections between the front transverse shafting and said picking means, picked cotton conveying tubes and a suction fan therefor mounted on the frame, and driving connections for said fan and the rear wheels of the machine operatively connected with said rear transverse shafting.

3. A cotton picker comprising a horizontal frame, wheels supporting the front and rear ends thereof, a motor mounted on said frame between the front and rear ends thereof, a front and a rear longitudinal shaft mounted on the frame in advance of and behind the motor respectively, front and rear transmissions operatively connecting the front and rear shafts respectively with the motor, rear transverse shafting mounted on the frame behind the motor and operatively connected with said rear longitudinal shaft, front transverse shafting mounted on the frame in advance of the motor and operatively connected with said front longitudinal shaft, cotton picking means carried by the front portion of said frame, driving connections between the front transverse shafting and said picking means, picked cotton conveying tubes and a suction fan therefor mounted on the frame, boll picking and boll conveying means also mounted on said frame, and driving connections for said fan, said boll conveying means and the rear wheels of the machine, these driving connections being operatively connected with said rear transverse shafting.

4. In a cotton picker, a frame, a horizontal driven shaft mounted thereon, bevel pinions slidable along and driven by said shaft, two vertical pickers having shafts whose upper ends are provided with bevel gears meshing with said pinions, yokes holding said pinions and gears in mesh with each other, upper and lower bearings for the picker shafts, upper and lower horizontal screws rotatably mounted on the frame and connected with said upper and lower bearings respectively

for adjusting them inwardly and outwardly, and driving means for said screws.

5. In a cotton picker, a frame, a horizontal driven shaft mounted thereon, bevel pinions slidable along and driven by said shaft, two vertical pickers having shafts whose upper ends are provided with bevel gears meshing with said pinions, yokes holding said pinions and gears in mesh with each other, upper and lower bearings for the picker shafts, a single upper horizontal screw mounted on the frame and connected with said upper bearings for adjusting them inwardly and outwardly, two relatively short lower horizontal screws axially aligned with each other and spaced apart, said lower screws being connected with said lower bearings for adjusting them inwardly and outwardly, two vertical shafts mounted on the frame at the outer ends of and extending between the upper and lower shafts, bevel gearing connecting the three screws with said vertical shafts, and means for driving one of said vertical shafts to effect simultaneous driving of the three screws.

6. In a cotton picker, a portable frame, two vertically elongated row-straddling plates mounted on said frame and converging forwardly, the front portions of said plates having boll picking fingers, two vertically elongated drums mounted on the frame and spaced laterally outward from the front ends of said fingers, said drums also having boll-picking fingers, means under said plates and drums for receiving the picked bolls, conveying means on the frame for carrying the bolls from said receiving means, and driving means for said drums and said conveying means.

7. A structure as specified in claim 6; said plates being pivotally mounted at their rear edges, and adjusting means for swinging said plates inwardly and outwardly.

8. In a cotton picking machine, a portable frame, a rotatable horizontal brush mounted on said frame with its axis transverse to the line of travel of the machine, said brush being adapted to spear and lift fallen cotton from the ground, a ground wheel secured coaxially to said brush for driving the same at a speed to merely cause rolling thereof along the ground as the machine advances, a spiked drum and a suction tube containing the same to remove cotton from the brush, and a driving connection between said brush and said spiked drum.

9. In a cotton picker, a portable frame, a vertical suction tube mounted on said frame and having its lower portion turned laterally and formed with a slot extending longitudinally of its lower side, a rotatable brush under said lateral tube portion with its upper portion disposed at said slot, said brush being adapted for picking fallen cotton from the ground, bearing brackets for said brush

secured to said tube, ground wheels secured
co-axially to said brush for driving the same,
a spiked drum mounted longitudinally in
said lateral tube portion for removing cot-
ton from said brush, and driving connections
5 between said brush and drum.

In testimony whereof I have hereunto af-
fixed my signature.

JAMES O. B. PALMER.

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