E. SWINDELL.

COTTON PICKER.

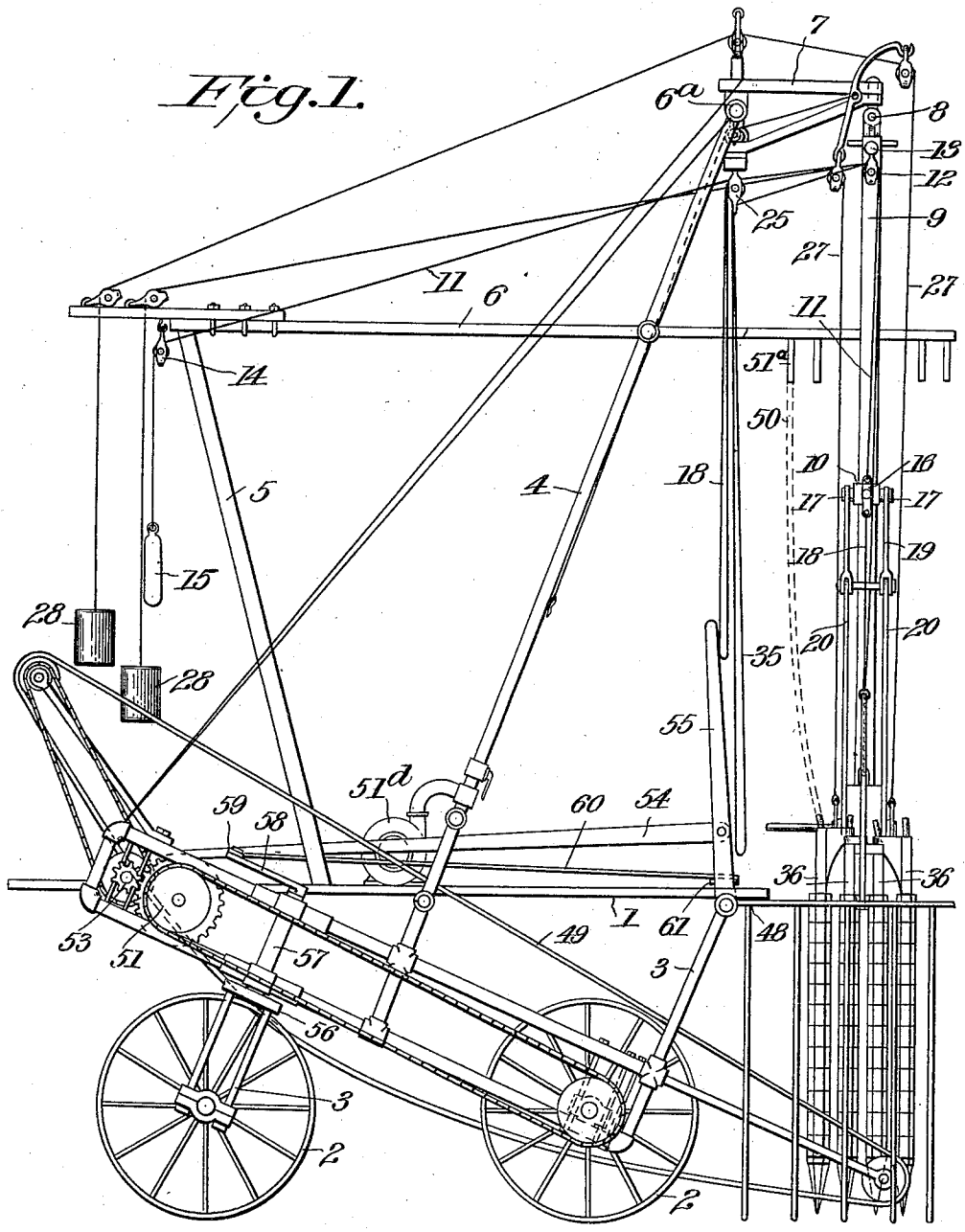
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1,080,127.

Patented Dec. 2, 1913.

6 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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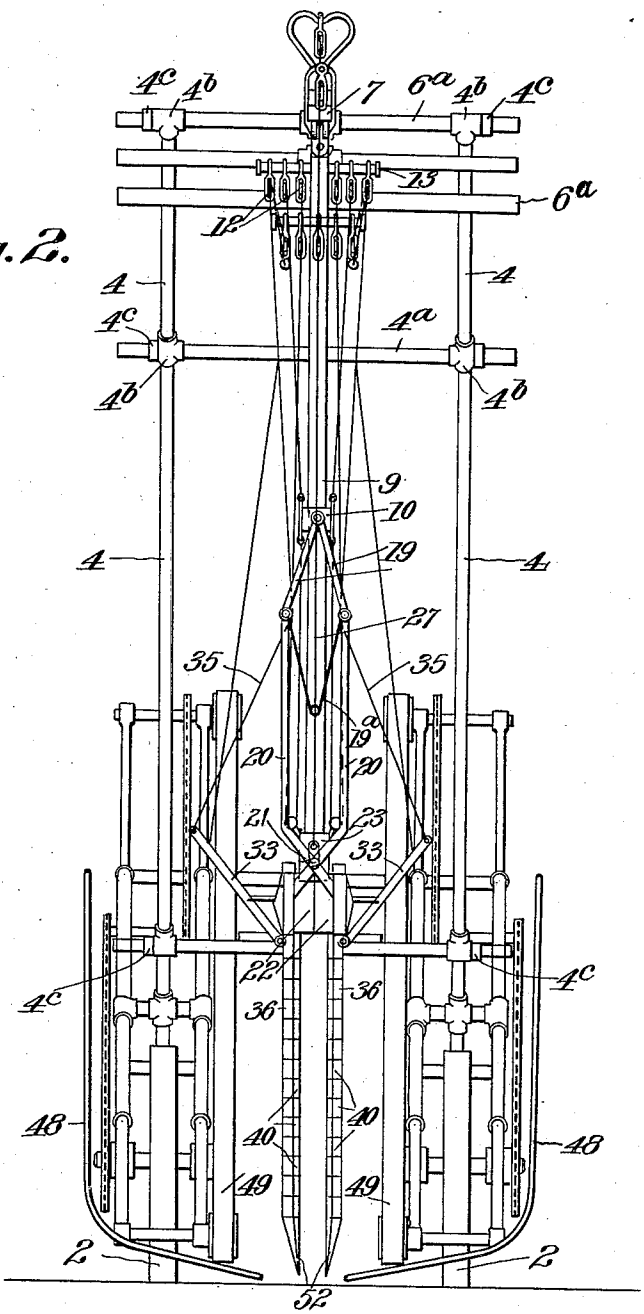
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6 SHEETS—SHEET 2.

Fig. 2.



WITNESSES

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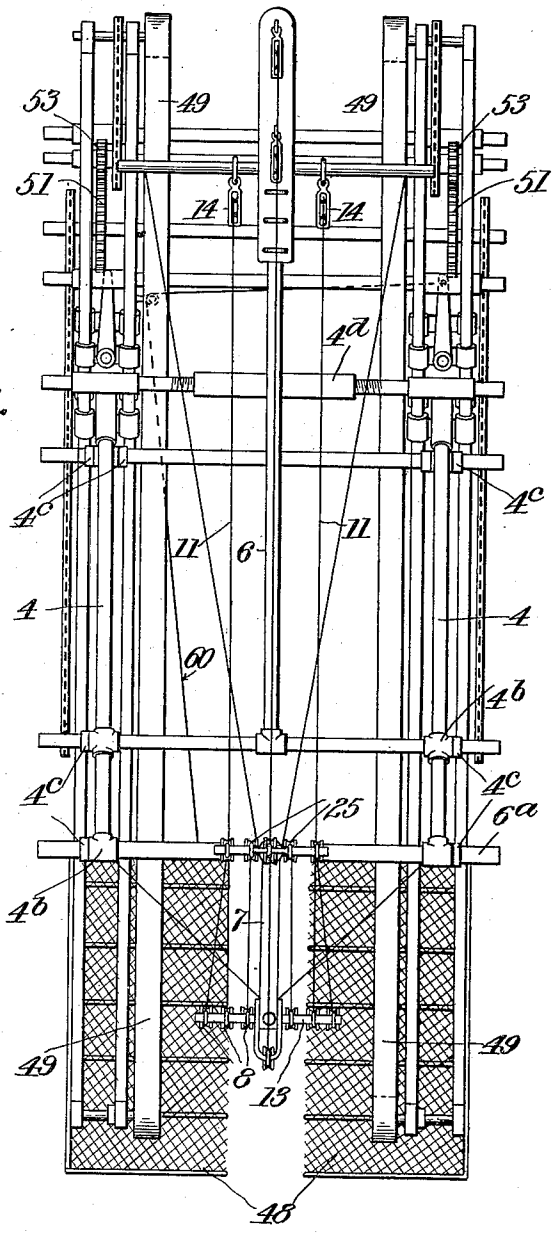
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6 SHEETS—SHEET 3.

Fig. 3.



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6 SHEETS—SHEET 4.

Fig. 4.

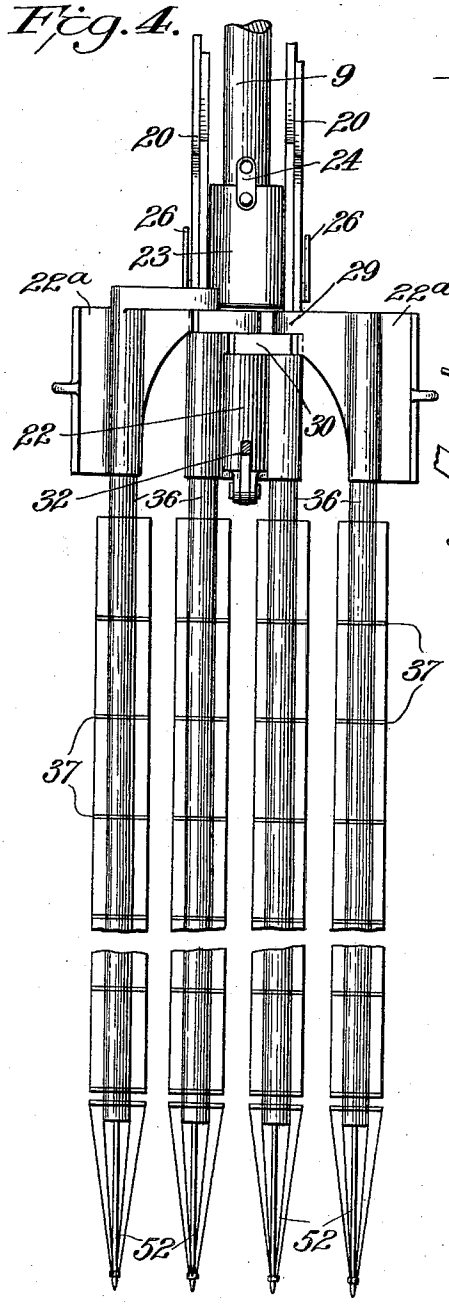
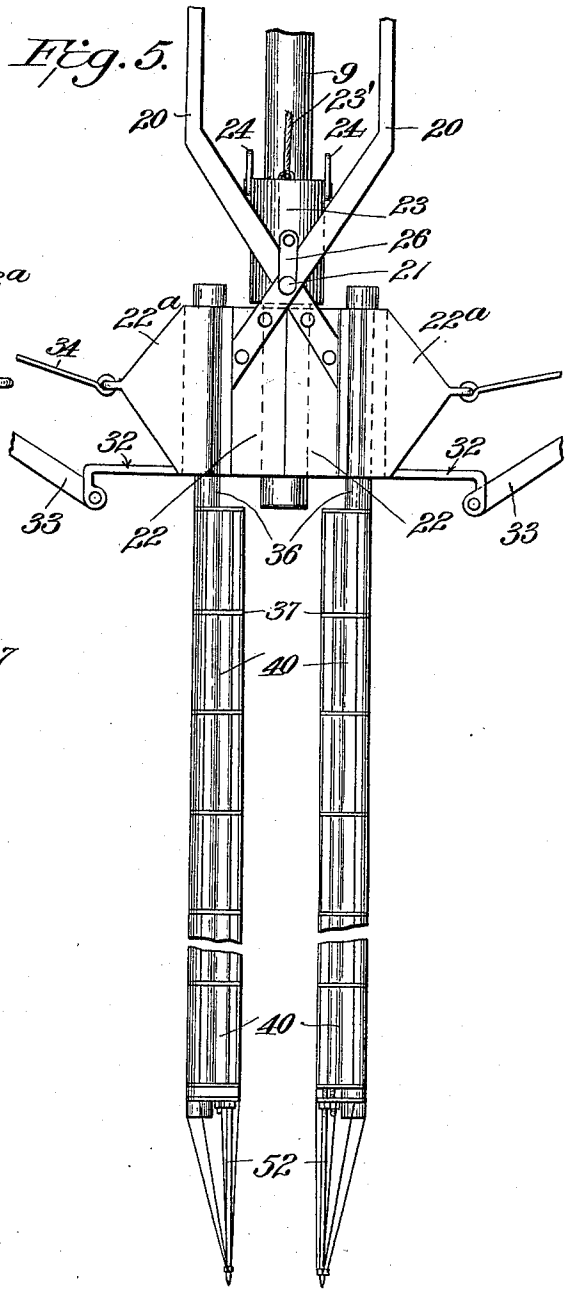


Fig. 5.



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6 SHEETS—SHEET 5.

Fig. 7.

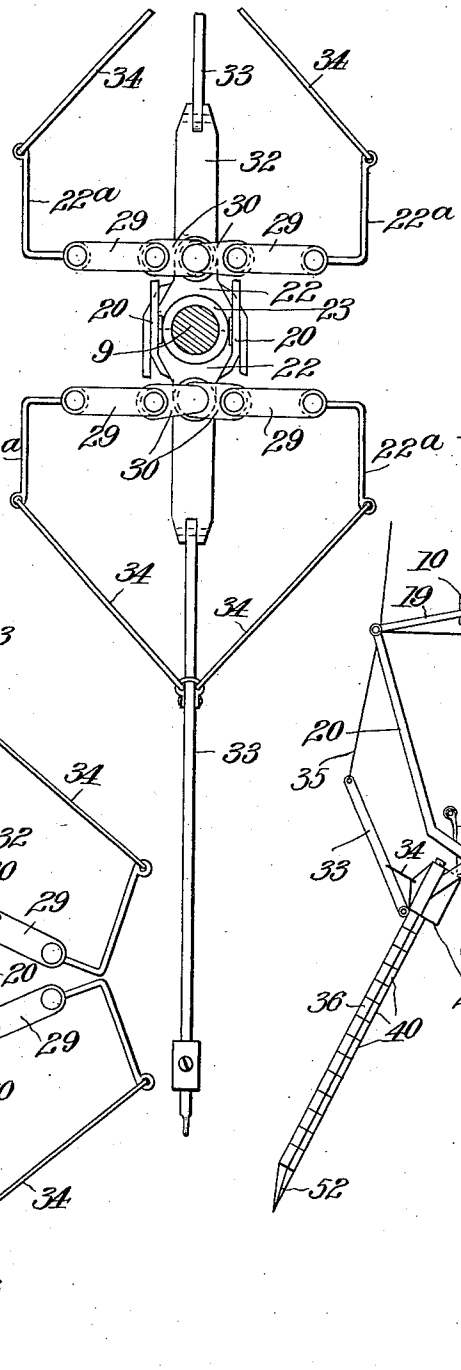


Fig. 8.

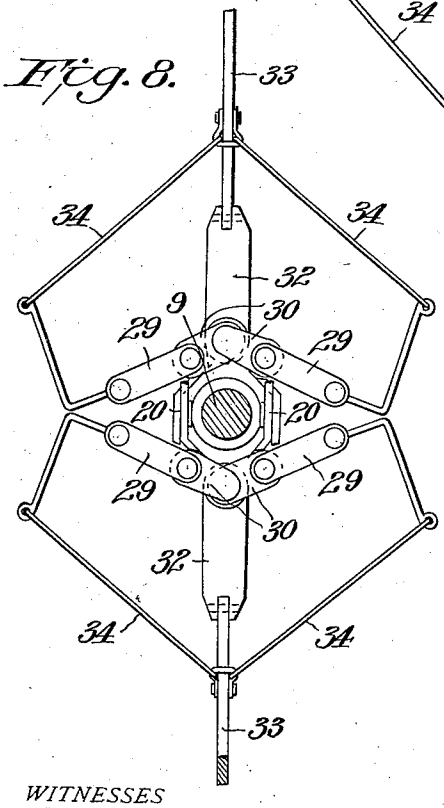
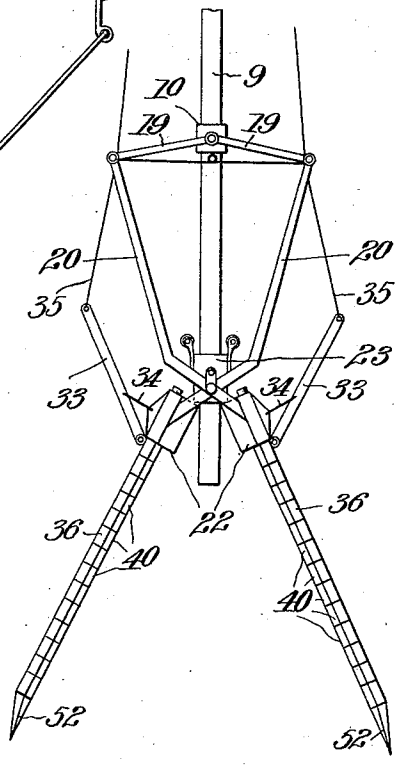


Fig. 6.



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APPLICATION FILED AUG. 9, 1912.

1,080,127.

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6 SHEETS—SHEET 6.

Fig. 9.

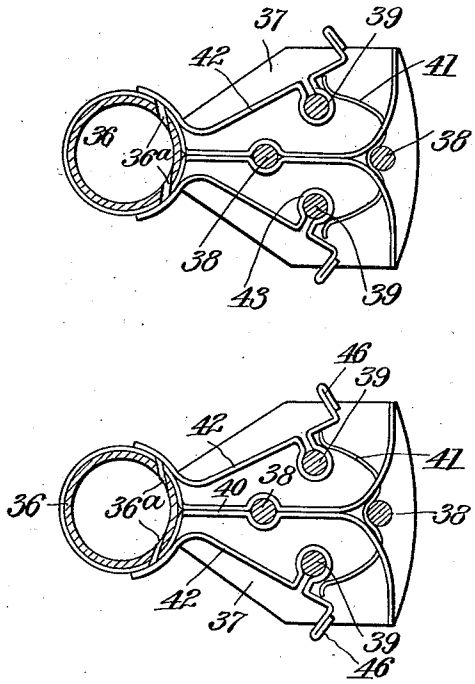


Fig. 10.

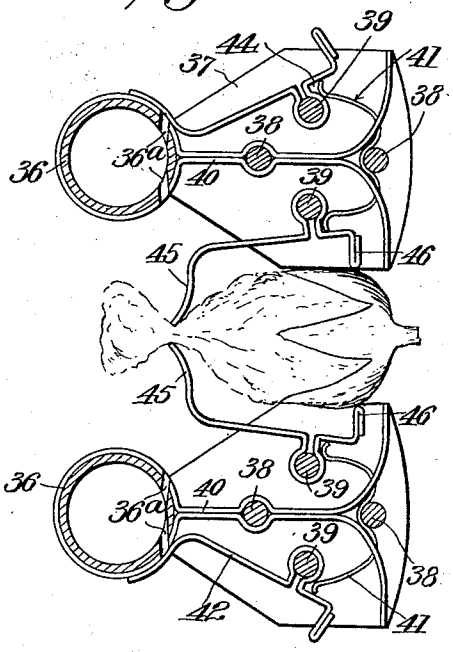


Fig. 11.

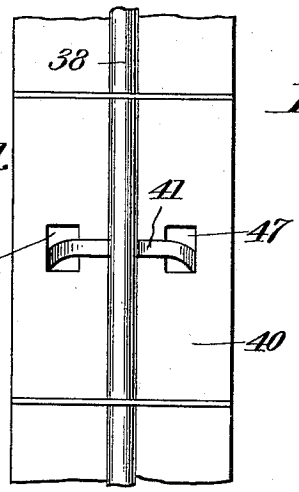
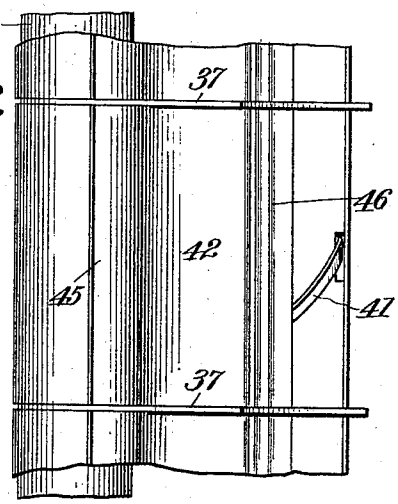


Fig. 12.



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UNITED STATES PATENT OFFICE.

EDWARD SWINDELL, OF APALACHICOLA, FLORIDA.

COTTON-PICKER.

1,080,127. Specification of Letters Patent. Patented Dec. 2, 1913.

Application filed August 9, 1912. Serial No. 714,214.

To all whom it may concern:

Be it known that I, EDWARD SWINDELL, a citizen of the United States, residing at Apalachicola, in the county of Franklin and State of Florida, have invented certain new and useful Improvements in Cotton-Pickers, of which the following is a full, clear, and exact specification.

My invention relates to cotton pickers, and one object of the invention is to provide a machine which may be readily transported over a cotton field, and which during its travel will remove from the successive plants all the ripened cotton and deliver the same to a bag or other receptacle carried by the machine.

A further object of the invention is to provide a vertically movable cotton picker and means whereby the picker in its vertical movement strips the cotton from the plant.

A further object of the invention is to provide means whereby the cotton will be effectually withdrawn from the bolls without any leaves or other trash, so that the work of cleaning and ginning the cotton will be facilitated and the value of the cotton increased.

A further object of the invention is to provide means whereby a cotton plant will be completely inclosed by the cotton picking devices and the said devices manipulated so that the cotton gripping elements will automatically engage the cotton and withdraw the same from the bolls, without injury to unripe bolls.

A further object of the invention is to provide simple and efficient means whereby the cotton will be removed from the cotton engaging members by means of air blasts and delivered upon conveyers which will carry it to the bags or other receptacles placed to receive the same.

The invention seeks generally to improve the construction, arrangement and operation of the parts of a cotton picking apparatus to the end that the durability and efficiency of the same may be increased, without prohibitive cost of manufacture.

All these stated objects and such other incidental objects as will appear as the description of the invention proceeds are attained in apparatus of the character illustrated in the accompanying drawings, the invention residing in certain novel features which will be particularly pointed out in the claims following the detailed description.

In the drawings, wherein similar numerals of reference are used to indicate corresponding parts in each of the several views—Figure 1 is a side elevation of a cotton picker embodying my improvement; Fig. 2 is an end elevation of the same; Fig. 3 is a plan view of the apparatus; Figs. 4 and 5 are respectively side and end elevations of the picker arms; Fig. 6 is a detail side elevation of the picker arms spread; Figs. 7 and 8 are detail plan views of the picker arms, showing the same as respectively in the closed and opened positions; Fig. 9 is an enlarged horizontal section through two adjacent picker arms, showing the same in the positions assumed when not in engagement with a cotton boll; Fig. 10 is a similar view, showing two of the grippers in engagement with a cotton boll; Fig. 11 is a rear elevation of a portion of a picker arm; and Fig. 12 is a side elevation of the same.

In carrying out my invention, I employ a platform 1, which is supported upon a truck comprising wheels 2 and running gear 3. Mounted upon the truck and the platform is a frame comprising upwardly extending braces or supports 4 and 5, and beams 6 carried by said supports, as shown most clearly in Fig. 1. At the upper ends of the forward braces or supports 4 are secured a plurality of cross bars 6^a, from which extends a forwardly projecting head frame 7, upon which the group of picker arms is suspended. The braces 4 are connected by pivotal cross rods at various points indicated at 4^a and these cross bars are connected with the braces by unions or couplings 4^b. At the opposite sides of the unions stop collars 4^c are adjustably secured upon the cross bars so that the braces may be secured at any desired distance apart according to the size of the plants or the distance between the rows. The braces and side bars of the frame are moved toward and from each other by a turn buckle 4^d which is interposed in one of the cross bars.

Connected centrally to the front side of the head frame 7 by a swivel indicated at 8, is a supporting rod 9, which extends downwardly to a point in advance of and approximately in the same horizontal plane with the platform 1. Slidably mounted upon said supporting rod or bar 9 is a collar 10 from which the cable 11 passes upwardly

to a pulley 12, hung upon a lateral supporting pin or rod 13 at the upper end of the bar 9, and thence passes rearwardly to a pulley 14, from which it depends to carry a counterbalance weight 15. Perforated lugs or ears 16 are provided on the sides of the collar 10 and extend above and below the same, while trunnions or pivot pins 17 are formed on the front and back of said collar, as shown. The counterbalance cable 11 is secured to the upwardly extending lugs 16, while the operating cable 18 is attached to the lower lug, the said cable being hereinafter more fully referred to. Upon the pivot pins or trunnions 17 are mounted links 19 which have their lower ends pivoted to the upper ends of longer links or levers 20, which have their lower ends bent toward each other and pivoted together at the point of intersection, indicated at 21, the extremities of the said levers or links being rigidly secured below their pivotal connection to sockets or castings 22. Between the said lever links 20 is a collar 23, in which are fitted the pivot pins 21, and at the upper end of the said collar 23, at the sides of the same, are guide eyes or pulleys 24, which receive the cables 18, extending downwardly from the lugs 16 on the upper collar 10. The cables 18 extend through the eyes or pulleys 24 and thence pass upwardly to guide pulleys supported at the upper end of the rod 9, and thence over pulleys indicated at 25 on the head frame 7, from which they depend to a point within convenient reach of the operator upon platform 1. Short links or straps 26 are mounted upon the pivot pins 21 and cables 27 extend upwardly therefrom and thence to the rear of the machine, where they are equipped with counterbalance weights 28. It will be readily understood that the counterbalance weights tend to hold the upper collar 10 in its raised position, while the weight of the picker arms carried by the levers 20 tend to hold the collar 23 in its lowered position. Consequently, if a pull be exerted upon the cable 18, it will draw downward on the collar 10 and thereby lower the said collar so that the links 19 will push against the upper ends of the levers 20 and as a result, will spread apart so that the said levers will swing about their pivotal connections and consequently move the sockets 22 into an inclined position so that the lower ends of the picker arms will be spread, and the cotton engaged by the pickers stripped from the plants.

A flexible brace 19^a is connected to and extends between the links 19 and the levers 20 and this flexible brace or connection serves as a stop to limit the outward movement of said joints and thereby prevent excessive spreading of the links and the levers. The collars 10 and 23 are likewise connected by a chain, wire or other flexible device, indicated at 23′, and which will prevent the upper collar being moved from the lower collar to such an extent as to permit the links 19 and levers 20 to be brought into alinement, it being understood that if the links and levers approach alinement the movement of the same to spread the picker arms would be uncertain and unreliable.

The pickers are arranged in series at each side of the central longitudinal plane of the machine, and are pivotally connected to each other at their upper ends, so that they may be arranged in a longitudinal plane of the machine or be swung into a semi-circular relation, so that the groups of picker arms at the two sides of the machine will be caused to approach and completely encircle the plant from which the cotton is to be picked. The upper ends of the outer picker arms as shown most clearly in Fig. 4, are formed at their inner ends with inwardly projecting lugs or ears 29, through which pivot pins are inserted to pivotally attach the said ends to the upper ends of the adjacent inner picker arms which in turn are pivoted to the central casting or socket 22. Extending laterally from the lower ends of the casting or socket 22, are arms 32 to which are attached connecting rods 33 and pivotally attached to the outer edges of the outer heads 22^a of the outer picker arms are links 34 which converge to and are pivotally connected with the rods 33. Cables 35 are attached to the outer ends of the said rods 33 and extend upwardly therefrom and over suitable guide pulleys at the upper end of the machine and thence downwardly to a point near the platform 1, as shown in Fig. 1. When a pull is exerted on the cable 35, said pull will be exerted through the rods 33 and the links 34, to cause the several heads 22^a to assume positions in the same vertical plane as shown in Fig. 7. When the pull on the cable 35 is withdrawn, and the pickers are lifted, the weight of the levers 33 and the links 34 will cause the outer heads 22^a to swing about their pivotal connections so that they will assume an arcuate relation, as illustrated in Fig. 8, so that if the picker arms be then lowered at the opposite sides of the next cotton plant, the plant will be entirely inclosed so that the picker arms will be in position to strip the same.

The picker arms each consists of a main vertical tubular member 36 secured rigidly in and depending from its respective head 22^a, and having plates 37 projecting laterally therefrom at intervals throughout its height. Securing bolts or rods 38 are inserted through the several plates 37, and pivot rods 39 are also inserted through the said plates, the securing bolts or rods 38 being disposed in the central longitudinal

plane of the plates, while the pivot rods are arranged at opposite sides thereof as clearly shown in Figs. 9 and 10. Partition plates 40, are fitted around the tubes 36 and extend to the outer corners of the plates 37 to reinforce the structure and also furnish supports for springs 41, bearing upon the inner ends of the grippers 42. The said grippers are preferably sheet metal plates of suitable dimensions to fit between the horizontal spaces or division plates 37, and are formed with intermediate tubular offsets 43 adapted to fit around the pivot rods 39, to permit the grippers to swing in horizontal planes. The gripper plates are extended laterally a slight distance from the eyes or sleeves 43 to provide shoulders or bearing points 44, against which the springs 41 may act, and they extend in opposite directions from the said offset bearing point 44, their outer extremities being slightly curved as shown at 45, to fit against the tubular support 36, and constitute cotton engaging fingers. The inner ends of the grippers are bent laterally to constitute boll-engaging fingers 46, disposed a slight distance from the bearing points or shoulders 44, and the springs 41 extend through openings 47 in the partition plate 40 to engage the said bearing points and normally hold the said fingers 46 projected as shown in Fig. 9, whereby as the picker arms are oscillated through the connecting rods 33, the said fingers 46 will be brought against the butts of the cotton bolls, and the grippers thereby oscillated about their pivotal supports to bring the fingers 45 into firm engagement with the cotton, as shown in Fig. 10. The continued movement of the picker arms will then act through the grippers to withdraw all the cotton from the bolls, leaving the same stripped clean. As the picker arms swing away from the cotton plant, the fingers 46, will, of course, clear the boll, and the springs 41 will then return the grippers to their normal position and release the cotton.

The cotton released from the grippers is deposited upon conveyers which carry it to bags or other receptacles provided on the platform 1, and to prevent loss of the cotton, I provide at the sides of the groups of picker arms guards consisting of frames 48, which project forwardly from the truck 3 at the sides of the pickers and are covered with netting, the frames being shaped to extend close to the lower ends of the picker arms and under the arcs described by the lower ends of the same, when they are vibrated to strip the cotton from the plant. To insure the discharge of the cotton upon the conveyers 49, which have their front ends disposed within the guards just described, as shown clearly in Fig. 1, I provide the tubes 36 with perforations 36ª, throughout their length, and connect the upper ends of the tubes to flexible pipes or hose indicated at 50 by dotted lines, with nipples 51ª, depending from the upper portion of the supporting frame. The said upper portion of the supporting frame and the braces 4 are hollow and are connected with any convenient form of blower which may be mounted upon the platform 1, and as indicated conventionally at 51ª.

The conveyers 49 are supported at the sides of the truck as clearly shown in Figs. 1 and 2 and are driven through chain and sprocket gearing, indicated at 51, receiving motion from the driving mechanism. As the conveyers may be of any well known belt and slat construction, I have indicated the same in the drawings in a conventional manner, as otherwise the drawings would be obscure. Adjacent the upper end of the conveyers, bags or other receptacles not shown may be placed to receive the cotton delivered by the conveyers. The driving shaft 53 of this gearing is provided at its center with a crank to which is connected a pitman 54 having its front end pivoted to a hand lever 55 fulcrumed upon the platform. The chain and sprocket gearing is connected with the axle of the front wheels 2, so that by vibrating the lever 55 motion will be imparted to the crank shaft 53, and through the same transmitted to the chain and sprocket gearing so as to drive the carrying wheels 2 and the conveyers 49, whereby the machine will be moved into position to act upon the next plant and the cotton deposited upon the conveyers will be moved part way to the bags or other receptacles.

While the hand propelled mechanism is illustrated for convenience, it is to be understood that the invention contemplates the use of a motor or the employment of a traction engine.

The rear wheels are connected by a cross bar or fifth wheel 56, from which rises a king bolt 57, provided at its upper end with a crank arm 58 having a cross head 59, at its free end. The ends of this cross head 59 are connected by links 60 with a vibratory bar or lever 61, pivoted upon the platform adjacent the front end thereof, so that by vibrating the said bar or lever the steering wheels may be turned to an angle with the line of draft and the machine consequently caused to follow any irregularities in the line of plants.

It is thought the operation and advantages of my improved cotton picker will be readily understood from the foregoing description taken in connection with the accompanying drawings. The machine is moved over the field with the picker arms at the opposite sides of a row of plants and is halted at intervals as the picker arms reach the successive plants. The picker arms

are normally in the position shown in Fig. 8, so that as they are lowered they will inclose the entire plant and the several picker arms are spaced apart sufficiently to permit the open bolls to pass between the adjacent arms. To facilitate the downward passage of the picker arms and cause the several stems or branches of the plants to pass into the spaces between the arms, I provide the lower ends of the picker arms with fenders consisting of wires or similar devices 52, secured to the lowermost plate 37, and converging downwardly therefrom to be secured to the lower extremity of the innermost bolt or securing rod 38. These fenders serve to separate the branches and stems of the plant and guide them into the spaces between adjacent picker arms. After the picker arms have been thus positioned around the plant, the cables 35 are pulled so as to draw upon the connecting rods 33 and the links 34, thereby bringing the picker arms into the position shown in Fig. 7, whereby all the bolls engaged by the picker arms will be brought into planes parallel with the conveyers. A pull is now exerted upon the cables 18 and the lower bights of the said cables, which are in engagement with the guides or pulleys 24, will thereby be shortened so that the collar 23 will be drawn upwardly and the levers 20 oscillated about the pivots 21, thereby causing the lower ends of the picker arms to swing in opposite directions toward the sides of the apparatus. As the arms swing outwardly the fingers 46 will engage the bolls as shown in Fig. 10, so that the plant will be stripped of its cotton. The cotton is discharged upon the conveyers, which deliver it to the bags or other receptacles to facilitate its storage or transportation to the baling presses. When the pull upon the cables 18 has caused the arms to be spread sufficiently to pick the cotton, outward movement of the arms is limited or stopped by the action of the brace 19^a, whereupon continued pull on the cables 18 will elevate the picker arms above the cotton plant, ready to be moved to the next plant. When the pull upon the cables 18 is released the levers 20 resume their normal positions, and thereby return the picker arms to the position shown in Fig. 8. It will be readily understood that after the picker arms have been fully spread, the continued pull upon the cable 18 will cause the picker arms to rise, so that they may be lifted to the height necessary to permit them to clear the plant, after which the machine is moved to the next plant and the former operation repeated.

It will thus be noted that I have provided a very compactly arranged and easily operated machine, by the use of which all the ripened cotton upon a plant will be stripped therefrom, free of leaves, stems or other trash, so that the subsequent operation of cleaning and ginning the cotton will be simplified and expedited.

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

1. A cotton picking apparatus comprising a plurality of picker arms, means for raising and lowering said arms in a vertical direction whereby they are caused to encircle the plant and engage the cotton thereon, and means for moving said arms laterally from the plant to strip the same of the cotton.

2. A cotton picking apparatus comprising a plurality of picker arms, means for raising and lowering said arms in a vertical direction whereby they are caused to encircle the plant and engage the cotton thereon, and means for oscillating said arms to strip the cotton from the plant.

3. A cotton picking apparatus comprising a plurality of picker arms disposed at opposite sides of a plant, means for causing said arms to encircle the plant, means for bringing the arms on one side of the plant into parallel relation with the arms on the opposite side thereof, and means for subsequently moving the arms clear of the plant.

4. A cotton picking apparatus comprising groups of picker arms, means for moving said arms vertically, means for bringing the arms of each group into position relative to each other whereby the two groups may inclose a plant, means for bringing the groups into parallelism, and means for moving the parallel groups in opposite directions to strip the cotton from the plant.

5. A cotton picking apparatus comprising a plurality of picker arms, means for vibrating the said arms, and grippers mounted upon said arms and adapted to automatically engage the cotton bolls and strip the cotton therefrom as the picker arms are vibrated.

6. A cotton picking apparatus comprising a plurality of picker arms, means for vibrating said arms, and grippers pivotally supported from said arms and adapted to automatically engage the cotton bolls and strip the cotton therefrom as the arms are vibrated.

7. In a cotton picking apparatus, the combination with a series of picker arms, of lateral supports carried thereby, grippers pivotally mounted upon the said supports and adapted to engage the cotton bolls as the picker arms move past the same, and springs carried by the supports and engaging the grippers to hold the same normally in position to engage a boll.

8. In a cotton picking apparatus, the combination of a picker arm, a gripper carried

by said arm and provided at one end with a boll engaging finger, and at its other end with a cotton engaging finger, and means for normally holding the gripper in position to engage a boll.

9. In a cotton picking apparatus, the combination of a picker arm, division plates extending laterally therefrom, pivot rods extending through the division plates, grippers mounted on said pivot rods and provided with boll engaging fingers at one side of the same and with cotton-engaging fingers at the opposite side thereof, and means for holding the grippers normally in position to engage a boll.

10. In a cotton picking apparatus, the combination of a picker arm, a lateral support thereon, grippers pivotally mounted upon the support and extending in both directions from the pivotal point, the opposite ends of the grippers being formed into fingers adapted to engage a cotton boll and the cotton projecting therefrom, and a spring carried by the said lateral support and bearing upon the grippers adjacent the pivots thereof to hold the same normally in position to engage the cotton bolls.

11. In a cotton picking apparatus, the combination of a picker arm, lateral division plates extending therefrom, partitions projecting from the picker arms between the plates and provided with openings adjacent their free ends, pivot rods extending through the several division plates at opposite sides of the partitions, securing rods extending through the division plates, grippers mounted upon the pivot rods, between the division plates, and springs extending through the openings in the partitions and fitted against the outer securing rods at their centers and having their free ends bearing upon the grippers.

12. In a cotton picking apparatus, a plurality of picker arms, a lateral support on each arm, grippers mounted pivotally upon the supports and extending in both directions from the pivotal point, the opposite ends of the grippers being formed into fingers adapted to engage a cotton boll and the cotton projecting therefrom, and springs carried by the lateral supports and bearing upon the grippers adjacent the pivots thereof to hold the same normally in position to engage the cotton bolls, means for moving said arms into engagement with a plant and means for oscillating said arms to strip the cotton from the plant.

13. In a cotton picking apparatus, the combination of a plurality of picker arms, lateral division plates extending therefrom, partitions projecting from the picker arms between the plates and provided with openings adjacent their free ends, pivot rods extending through the several division plates at opposite sides of the partitions, securing rods extending through the division plates, grippers mounted upon the pivot rods between the division plates, and springs extending through the openings in the partitions and fitted against the outer securing rods at their centers and having their free ends bearing upon the grippers, means for moving said arms into engagement with a plant and means for oscillating said arms to strip the cotton from the plant.

14. In a cotton picking apparatus, the combination of a portable frame, a support thereon, a plurality of tubular picker arms sustained by said support, means for raising and lowering said support about a plant, means for creating a blast of air through said arms, and means carried by said arms to strip cotton from a plant and release the same in the path of said blast.

15. In a cotton picking apparatus, the combination of a portable frame, a support thereon, a plurality of picker arms sustained by said support, means for raising and lowering said support whereby the picker arms are caused to encircle a plant, and means for vibrating said arms to strip cotton from the plant.

16. In a cotton picking apparatus, the combination of a portable frame, conveyers mounted thereon, a support on the frame, a plurality of picker arms sustained by said support and disposed between the conveyers, means for raising and lowering said support whereby the picker arms are caused to encircle a plant, means for vibrating said arms to strip cotton from a plant, and means for creating a blast of air through the arms to transfer cotton from the picker arms to the conveyers.

17. In a cotton picking apparatus, the combination of a supporting rod, a plurality of picker arms disposed adjacent the lower end of the rod, collars slidably held on said rod, levers pivotally mounted on the lower collar and connected to the picker arms, links pivoted to the said levers and to the upper collar, and a cable secured to the upper collar passing downwardly therefrom to the lower collar and then upwardly therefrom.

18. In a cotton picking apparatus, the combination of a support, a plurality of picker arms mounted thereon and pivotally connected, and means connected with the outermost picker arms whereby to move them about the inner picker arms, substantially as and for the purpose set forth.

19. In a cotton picking apparatus, the combination of a support, a plurality of picker arms mounted thereon, means for raising and lowering said arms about a plant, a socket, means connected with said socket for vibrating all of said arms, pivotal connections between the picker arms and the

socket and means for moving the picker arms about their pivotal connections, substantially as described.

20. In a cotton picking apparatus, the combination of a support, sockets disposed adjacent the lower end of the support, levers mounted on the support and connected with the said sockets, a plurality of picker arms pivotally connected to each other and to the said sockets, a lever pivotally connected to the said sockets, connecting rods between the outmost picker arms and the said levers and means for vibrating the said levers.

21. In a cotton picking apparatus, the combination with uprights, cross bars connecting said uprights, a support depending from said cross bars, a plurality of picker arms mounted on said support at the lower end thereof, adjustable connections between the cross bars and the uprights, means for extending one of the cross bars whereby to move the uprights toward and from each other, means for causing the picker arms to inclose a plant and means for moving said arms laterally to strip the cotton from the plant.

22. A cotton picking apparatus comprising picker arms, means for raising and lowering said arms about a plant, means for spreading said arms laterally and simultaneously stripping cotton from the plant.

23. A cotton picking apparatus comprising vertically disposed picker arms, means on said arms to engage cotton between them, and means for lowering the picker arms around a plant and spreading said arms laterally and raising the arms to strip the cotton from the plant.

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

EDWARD SWINDELL.

Witnesses:
CHAS. E. RIORDAN,
A. M. PARKINS.

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