J. B. NEIL.

COTTON PICKER.

APPLICATION FILED JAN. 9, 1913.

1,213,529.

Patented Jan. 23, 1917.

5 SHEETS—SHEET 1.

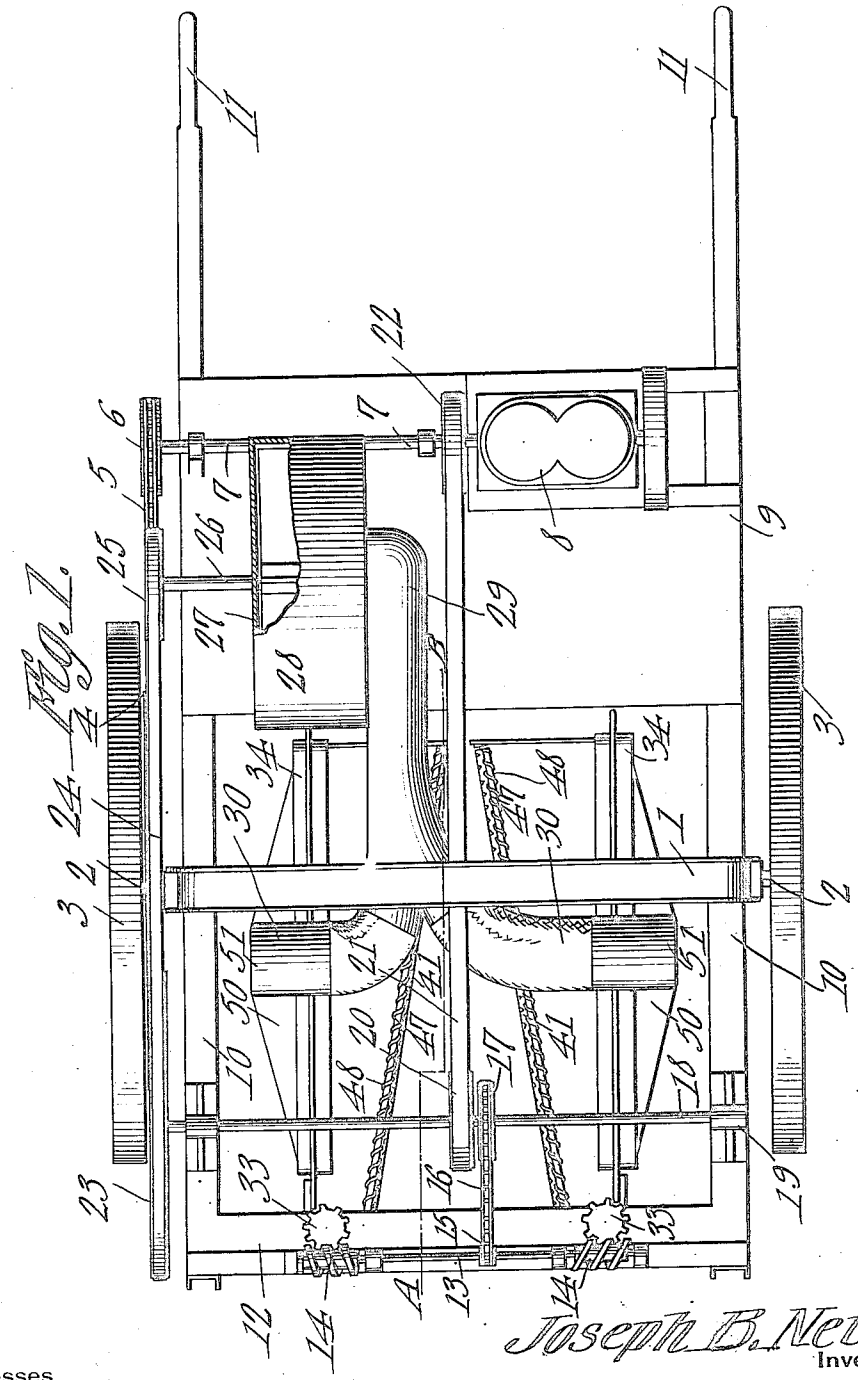


FIG. 1.

Witnesses

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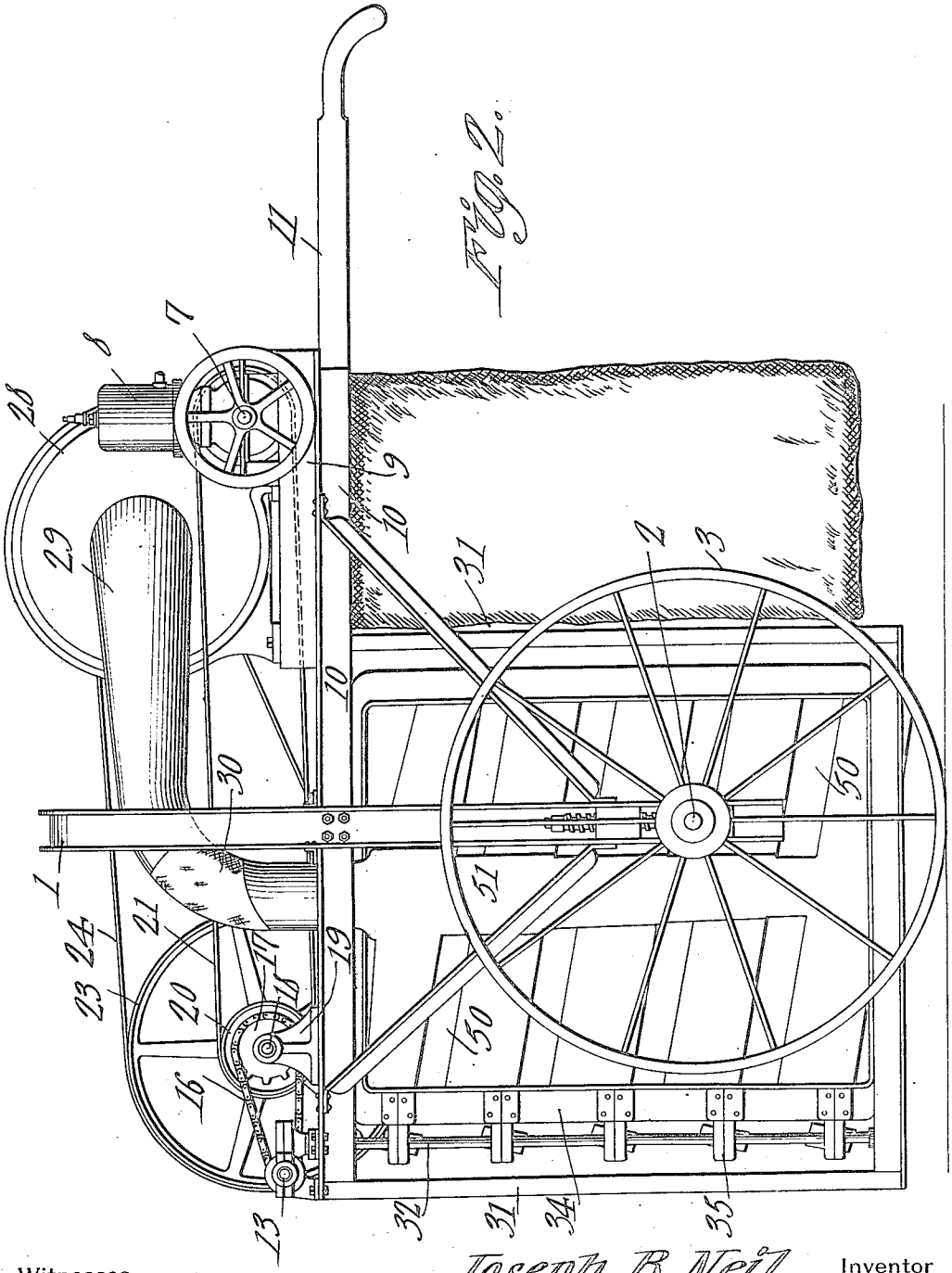
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5 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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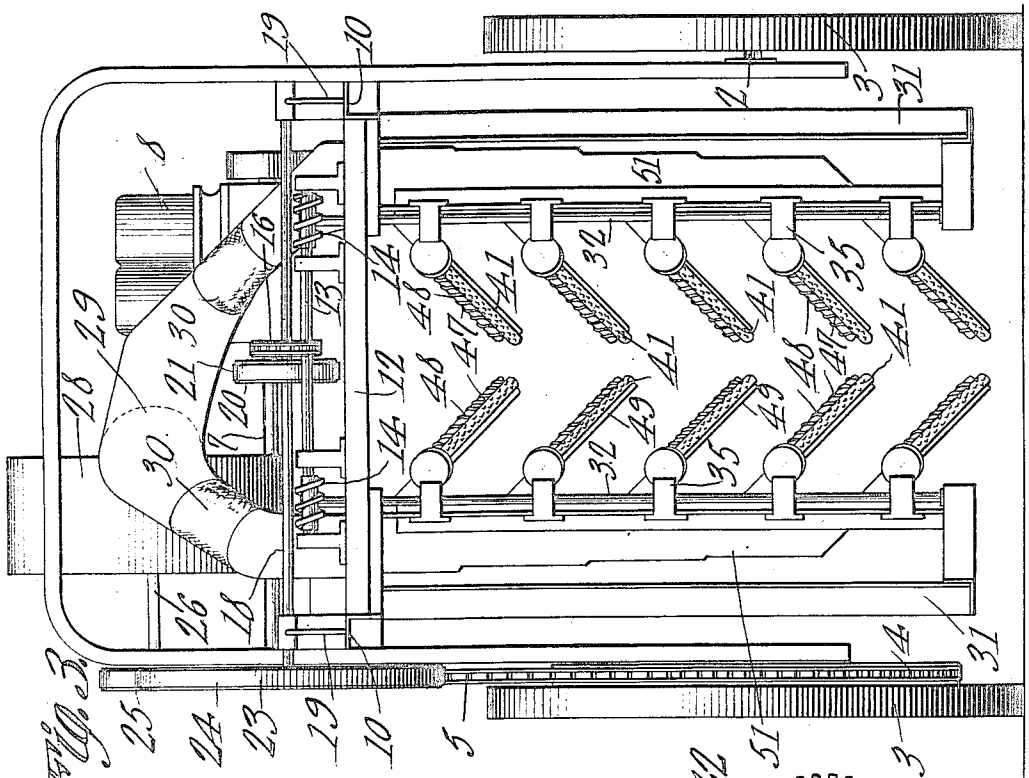


Fig. 3.

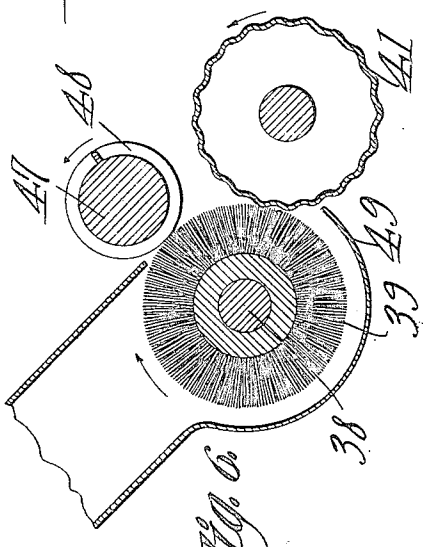


Fig. 6.

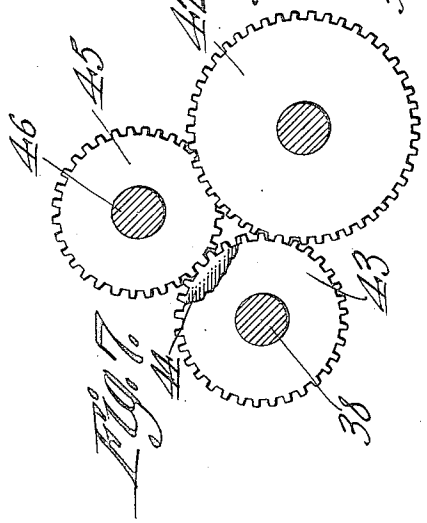


Fig. 7.

Witnesses

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5 SHEETS—SHEET 4.

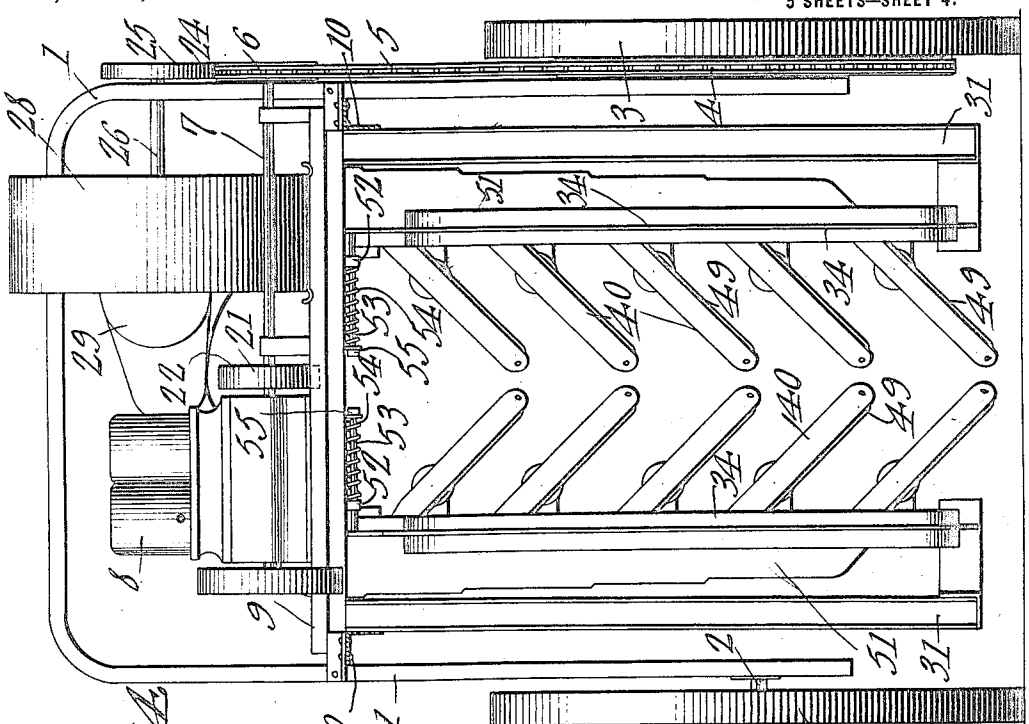


Fig. 4.

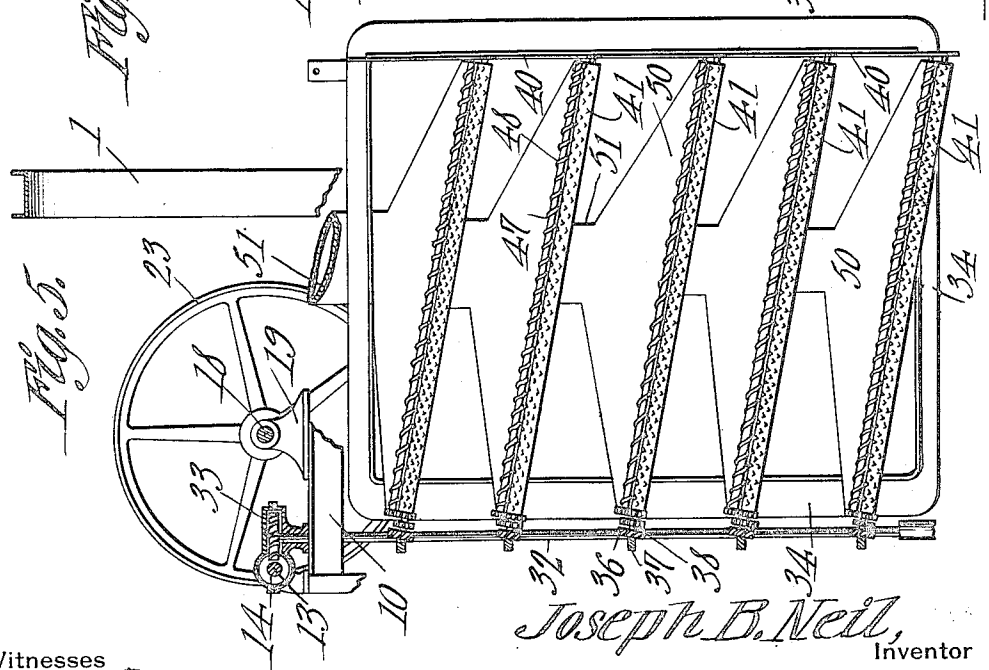


Fig. 5.

Witnesses

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5 SHEETS—SHEET 5.

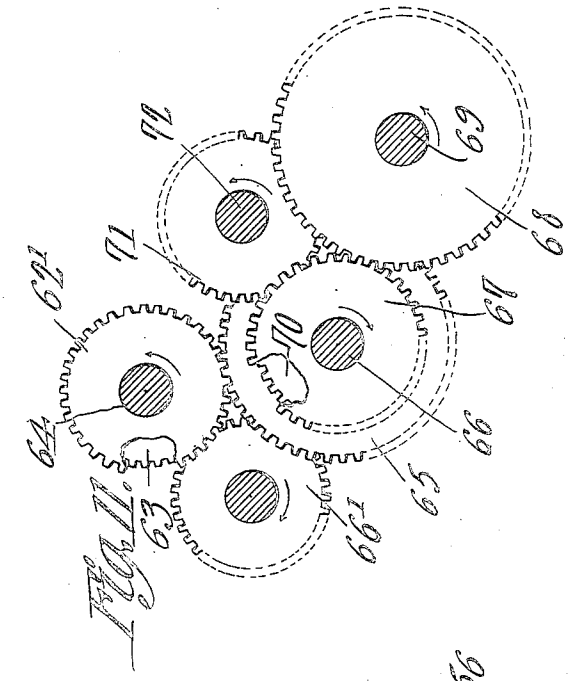


Fig. 11.

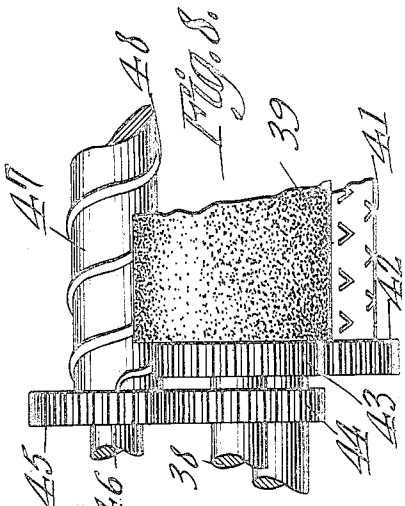


Fig. 8.

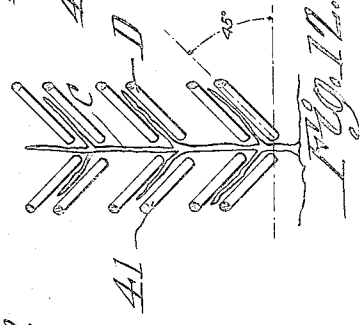


Fig. 12.

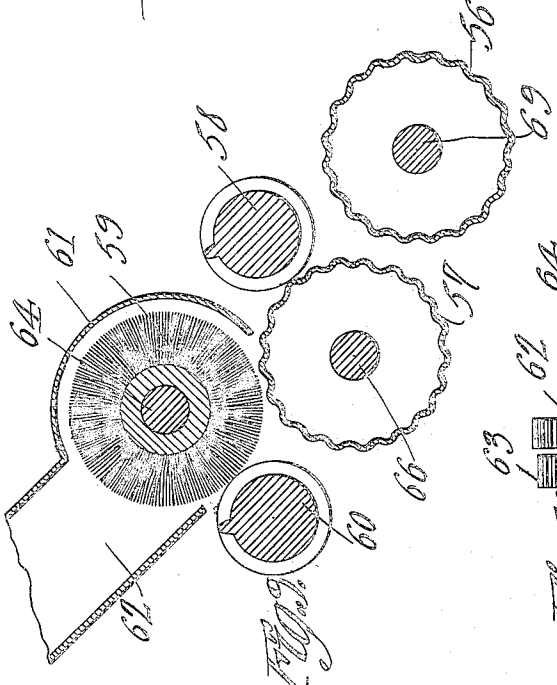


Fig. 9.

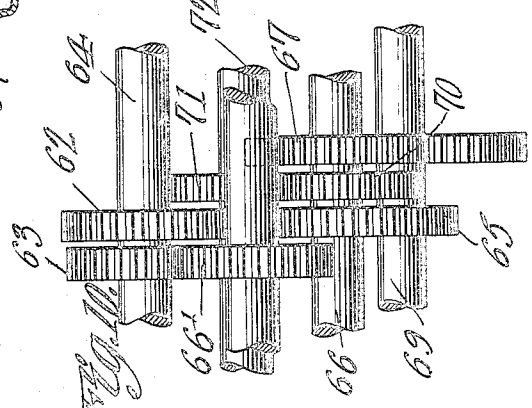


Fig. 10.

Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH B. NEIL, OF FILBERT, SOUTH CAROLINA, ASSIGNOR TO SOUTH CAROLINA COTTON PICKER COMPANY, OF YORKVILLE, SOUTH CAROLINA.

COTTON-PICKER.

1,213,529. Specification of Letters Patent. Patented Jan. 23, 1917.

Application filed January 9, 1913. Serial No. 741,058.

To all whom it may concern:

Be it known that I, JOSEPH B. NEIL, a citizen of the United States, residing at Filbert, in the county of York and State of South Carolina, have invented a new and useful Cotton-Picker, of which the following is a specification.

This invention relates to cotton picking machines and is more particularly designed as an improvement upon the structure disclosed in Patent No. 1,121,592, issued to me on Dec. 15, 1914.

One of the objects of the invention is to reduce to the minimum the number of picking rolls necessary to remove the cotton fiber from all portions of the plants in the path of the machine.

A further object is to provide means whereby the mechanism for actuating the rolls can be greatly simplified.

A further object is to provide improved means for removing the cotton from the picking rolls and conveying it to a point where it can be taken from the machine.

Another object is to condense, lighten, and otherwise improve upon devices of this character such as heretofore constructed.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings, Figure 1 is a plan view of the machine. Fig. 2 is a side elevation thereof. Fig. 3 is a front elevation. Fig. 4 is a rear elevation of the machine. Fig. 5 is a section on line A—B Fig. 1, the air trunk being broken away and only a portion of the main frame being shown. Fig. 6 is an enlarged section through one picking unit and showing its doffing brush, its air trunk and its spiral plan engaging member. Fig. 7 is a detail view of the gears employed for transmitting motion from the shaft of the doffing brush to the picking roll and to the spiral roll of the same unit. Fig. 8 is a back elevation of a portion of one of the doffing brushes and the adjacent spiral and picking roll and showing the power transmitting gearing. Fig. 9 is a view similar to Fig. 6 but showing a modified structure in which two picking rolls are combined in one unit. Fig. 10 is an edge view of the gearing utilized for transmitting motion to the various parts of the unit shown in Fig. 9. Fig. 11 is a side elevation of said gearing, the shafts being shown in section and certain of the parts being broken away. Fig. 12 is a view showing diagrammatically a plant and picking rolls acting upon the limbs of the plant.

Referring to the figures by characters of reference 1 designates an arch having spindles connected to the end portions thereof, as shown at 2, these spindles being engaged by supporting wheels 3, one of which has a sprocket 4 secured thereto whereby motion is transmitted to the wheel through a chain 5. This chain is driven by a sprocket 6 secured to a shaft 7 which, in turn, is driven by a motor 8 mounted on a platform 9. This platform is supported by rearwardly extending beams 10 constituting the top of the main frame, said beams being provided at their back ends, with handles 11.

A cross beam 12 connects the front ends of the side beams 10 and has a shaft 13 extending longitudinally thereof, this shaft being provided, near its ends, with worms 14. A sprocket 15 is secured to shaft 13 and receives motion through a chain 16 from another sprocket 17 secured to an intermediate shaft 18. This intermediate shaft is journaled within bearings 19 secured to the side beams 10 and a pulley 20 is carried by said shaft 18 and receives motion, through a belt 21 or the like, from a pulley 22 secured to shaft 7. Another pulley 23 or the like is secured to the shaft 18, preferably at one end, and serves to drive a belt 24 or the like which transmits motion to a pulley 25 or similar element secured to the shaft 26 of a fan 27 mounted for rotation within a fan casing 28. This casing is supported on the platform 9 and has an air trunk 29 extending to the inlet thereof, said trunk being provided with oppositely extending flexible branches for the purpose hereinafter set forth.

Downwardly extending side frames 31 are secured to the side beams 10 and extend under the ends of the arch 1. Journaled

upon the bottom portions of the side frames and within the cross beam 12 are upstanding parallel shafts 32, the upper ends of which are provided with worm wheels 33 meshing with the respective worms 14. These shafts 32 are spaced apart a distance slightly greater than the width of a large size cotton plant.

Arranged between the side frames 31 are upstanding movable frames 34, each of these movable frames being provided, upon its front end, with forwardly extending casings 35 adapted to swing about the adjacent shaft 32 as a pivot. Each casing constitutes not only a connection between the movable frame 34 and the shaft 32 but also serves to house a worm gear 36 and another worm gear 37, the last named gear 37 being secured to the shafts 32 so as to rotate therewith. Each gear 36 is secured to one end portion of a shaft 38 of the doffing brush 39 of one picking unit. The rear end of each shaft 38 is journaled within the free end of an arm 40 extending inwardly from the rear portion of the movable frame 34 of the shaft, this arm being disposed at an angle of 45 degrees to the horizontal as will be apparent by referring to Fig. 4. Furthermore the shaft 38 and the brush thereon is inclined downwardly and rearwardly and said shaft and the frame 34 diverge rearwardly so that all parts of the longitudinal axis of the shaft 38 occupy a plane extending at an angle of 45 degrees to the horizontal, the front end of the shaft being nearer the frame than the rear end.

Combined with each brush are the picking, limb holding and cotton withdrawing means constituting the balance of the picking unit. The picking roll, indicated at 41, has its longitudinal axis parallel with the shaft 38, this roll being formed with longitudinal corrugations as shown and being likewise provided with picking teeth extending transversely of the corrugations. Inasmuch as this roll does not constitute any part of the present invention, it has not been deemed necessary to enter into a detailed description thereof or to illustrate the same specifically, the exact structure being illustrated in my application hereinbefore referred to. One end of the roll has a gear 42 revoluble therewith, this gear receiving motion through a smaller gear 43 from the shaft 38 of the doffing brush. Another gear 44 of the same size as gear 43 rotates with shaft 38 and meshes with a gear 45 secured to a shaft 46. This shaft is located parallel with the shaft 38 and the axis of picking roll 41 and is disposed above the space between the picking roll and the shaft 38, as shown particularly in Figs. 6 and 7. Shaft 46 carries a roll 47 provided with a spiral 48 and this spiral is so pitched that, when the same is rotating, during the forward movement of the machine as hereinafter set forth, the spiral will feed backwardly the limbs engaged thereby so as thus to compensate for the forward drag or pull upon the limbs and, consequently, maintain the limbs practically in their normal positions while the machine is passing them and removing the cotton therefrom.

It is to be understood that the doffing brush 39 is located along the outer portion of the picking roll 41 so that it will not interfere with said roll coming into engagement with the plant. A hood or housing 49 houses the major portion of the doffing brush and extends thereunder and close to the picking roll 41 while the upper portion of the hood extends close to the pass between the doffing brush and the spiral roll 47. An air flue 50 extends upwardly from the hood so as to occupy a plane disposed at 45 degrees to the horizontal, and the front and back portions of this flue converge toward the center of the back of the flue where said flue opens into an upwardly extending trunk 51 with which one of the flexible branches 30 communicates. It is to be understood of course that the doffing brush extends throughout the length of the picking roll and that, consequently, the hood or housing 49 extends likewise throughout the length of said roll and of the doffing brush. All parts of the hood and of the flue 50 are disposed at the same angle to the horizontal as are the movable elements of the picking unit so that, when viewed in front elevation, the parts of said unit will appear as occupying a plane disposed at an angle of 45 degrees to the horizontal. This will be apparent by referring to both Fig. 3 and Fig. 4. Ears 52 are extended downwardly from the platform 9 and are slidably engaged by rods 53, these rods extending inwardly from the rear portions of the movable frames 34. Springs 54 are mounted on the rods and each bears at one end against one of the ears 52 and at its other end against a head 55 upon the rod. Thus the springs operate to push normally against the heads 55 and thus hold the rear end portions of the movable frames 34 normally extended toward each other. Said frames are free, however, to swing laterally at their rear ends in order to permit passage of any objects which may be received between the rear end portions of the oppositely arranged picking units.

It is to be understood that each of the movable frames 34 is provided with a series of picking units such as has been described, the units on one frame being arranged directly opposite the units on the other frame.

It is a well known fact that cotton plants grow with their limbs extended approximately along lines at 45 degrees to the horizontal. Thus it will be seen that, by ar-

ranging oppositely disposed picking rolls with their front ends spaced apart greater distances than their rear ends and with their rear ends disposed in lower planes than their front ends, the said rolls will appear, in front elevation, as though disposed at 45 degrees to the horizontal. Obviously, therefore, when a picking roll, thus arranged, is brought against a plant, the front or raised end of the roll will engage the outer end portion of the plant and, as the roll moves forward, it will work down along the limb of the plant until the rear end of the roll moves off of the limb at a point close to the trunk of the plant. Thus it is possible, with a single picking roll, to act upon a limb of a cotton plant throughout the length of said limb. The present invention includes a plurality of rolls disposed in this manner, these rolls being arranged in opposed series and a sufficient number of them being employed to act upon practically all the limbs of a plant received between the said series. As the machine moves along a row the forward ends of the picking rolls 41 will engage the upper ends of the limbs of the plant and the rolls will work along the limbs and ultimately pass off of the limbs close to the trunk of the plant. The rolls are rotated during this forward movement of the machine and pick the fiber from the plant. The rolls carry the fiber upwardly and the brushes 39 doff it therefrom and the air rushing into the flue 50 to the trunks 51 and the fan casing 28 will suck the picked fiber off of the doffing brushes and into the casing 28 from which it will be discharged into a suitable receptacle provided therefor. As all parts of each picking unit are disposed substantially in the same plane which, when viewed in front elevation, is disposed at an angle of 45 degrees to the horizontal, it will be seen that none of the parts of the units will engage the limbs of the plant to an objectionable extent but all of them will pass freely between the limbs while said limbs are being acted on by the picking rolls. Furthermore the spiral rolls 47 will, during the picking operation, engage the limbs and hold them back so as to compensate for the forward pull or drag upon the limbs and thus maintain the limbs practically in their normal positions while the machine is acting upon them.

Instead of utilizing a single picking roll in each unit, two picking rolls may be provided, as shown in Figs. 9, 10 and 11. When two rolls are thus employed, said rolls being indicated at 56 and 57, one spiral roll 58 is arranged above the space between the two picking rolls while the doffing brush 59 is disposed above the outer picking roll or, in other words, above the picking roll farthest removed from the center of the machine. Another spiral roll 60 is disposed adjacent the outer portion of the doffing brush 59 and of the outer picking roll 57. The doffing brush 59 is extended within a hood or housing 61 communicating with a flue 62 such as hereinbefore described. The gearing employed for operating these parts can be of any preferred construction and arrangement. In the drawings the doffing brush 59 has been shown provided with two gears 62′ and 63 upon its shaft 64, the gear 62′ meshing with a large gear 65 secured to the shaft 66 of the picking roll 57, this shaft constituting the drive element. A gear 66′ meshes with gear 63 and is secured to the shaft of the spiral roll 60. A gear 67 is secured to the shaft 66 and drives another gear 68 secured to the shaft 69 of the other picking roll 56. A third gear 70 is secured to shaft 66 and drives a gear 71 which is secured to the shaft 72 of the other spiral roll 58. Thus it will be seen that during the actuation of the mechanism, rolls 56 will pick fiber from the plants and roll 58, which rotates at a greater speed, will pick the fiber off of the roll 56 and carrying it upwardly to the doffing brush 59 which in turn, will convey the fiber into the hood or housing 61 from which it will be sucked into flue 62.

The relation of the picking rolls to the limbs of a cotton plant has been clearly disclosed diagrammatically in Fig. 12 wherein the plant has been indicated at C and the picking rolls at D.

What is claimed is:—

1. A cotton picking machine having superposed housings arranged in opposed series all of the housings of each series being parallel and the housings of the opposed series converging downwardly toward one end of the machine, the inner sides of the housings being open, suction flues communicating with the housings at the outer sides thereof, and cotton picking means along the open inner side of each housing and parallel therewith.

2. In a cotton picking machine, superposed inclined housings open along their inner sides, said inner sides converging downwardly toward one end of the machine, suction flues communicating with the housings at the outer sides thereof, and a pair of picking rolls parallel with and disposed close to the open inner side of each housing.

3. In a cotton picking machine, superposed inclined housings open along their inner sides, said inner sides converging downwardly toward one end of the machine, suction flues communicating with the housings at the outer sides thereof, a picking roll parallel with and disposed close to the open side of each housing, and means for removing material from the picking roll and directing it into the adjacent housing.

4. In a cotton picking machine, superposed inclined housings open along their inner sides, said inner sides converging downwardly toward one end of the machine, suction flues communicating with the housings at the outer sides thereof, a pair of picking rolls parallel with and disposed along the open inner side of each housing, and doffing means within each housing for removing material from one of the rolls, said roll constituting means for removing material from the other roll.

5. In a cotton picking machine, the combination with two opposed series of housings having their inner edges converging downwardly at one end of the machine, a picking roll parallel with and adjacent the open inner side of each housing, and means for removing material from the picking roll and directing it into the adjacent housing, said housings and picking means being inclined to conform to the natural position of the limbs of plants whereby the housings and picking devices may enter between and move freely among the limbs of the plant, and suction flues communicating with the housings at the outer sides thereof.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOSEPH B. NEIL.

Witnesses:
H. W. DUNLOP,
JULIA SMITH.