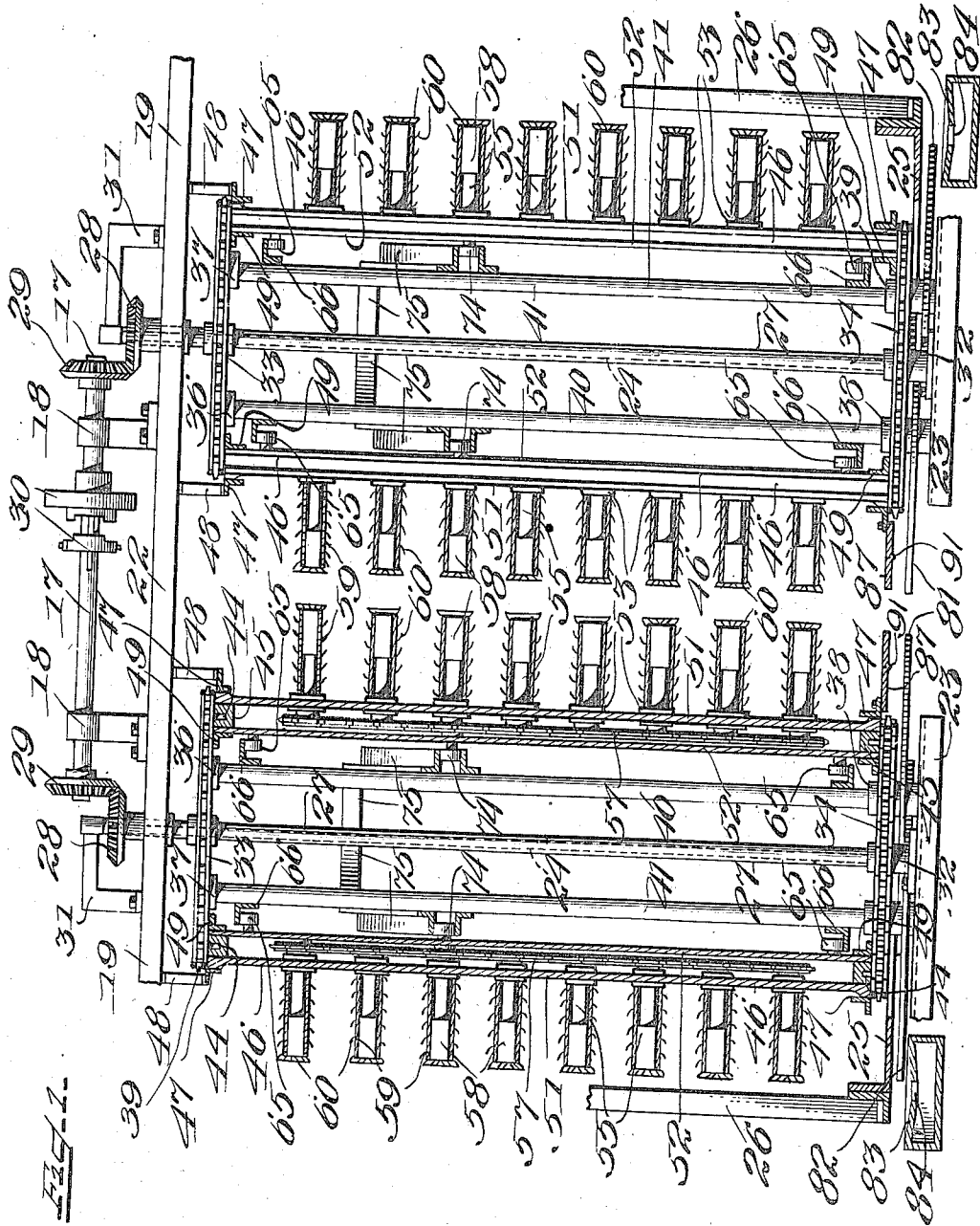


G. LISPENARD.
COTTON HARVESTER.
APPLICATION FILED JAN. 12, 1909.

976,084.

Patented Nov. 15, 1910.

5 SHEETS—SHEET 1.



Witnesses:
C. S. Ashley
D. S. Harris

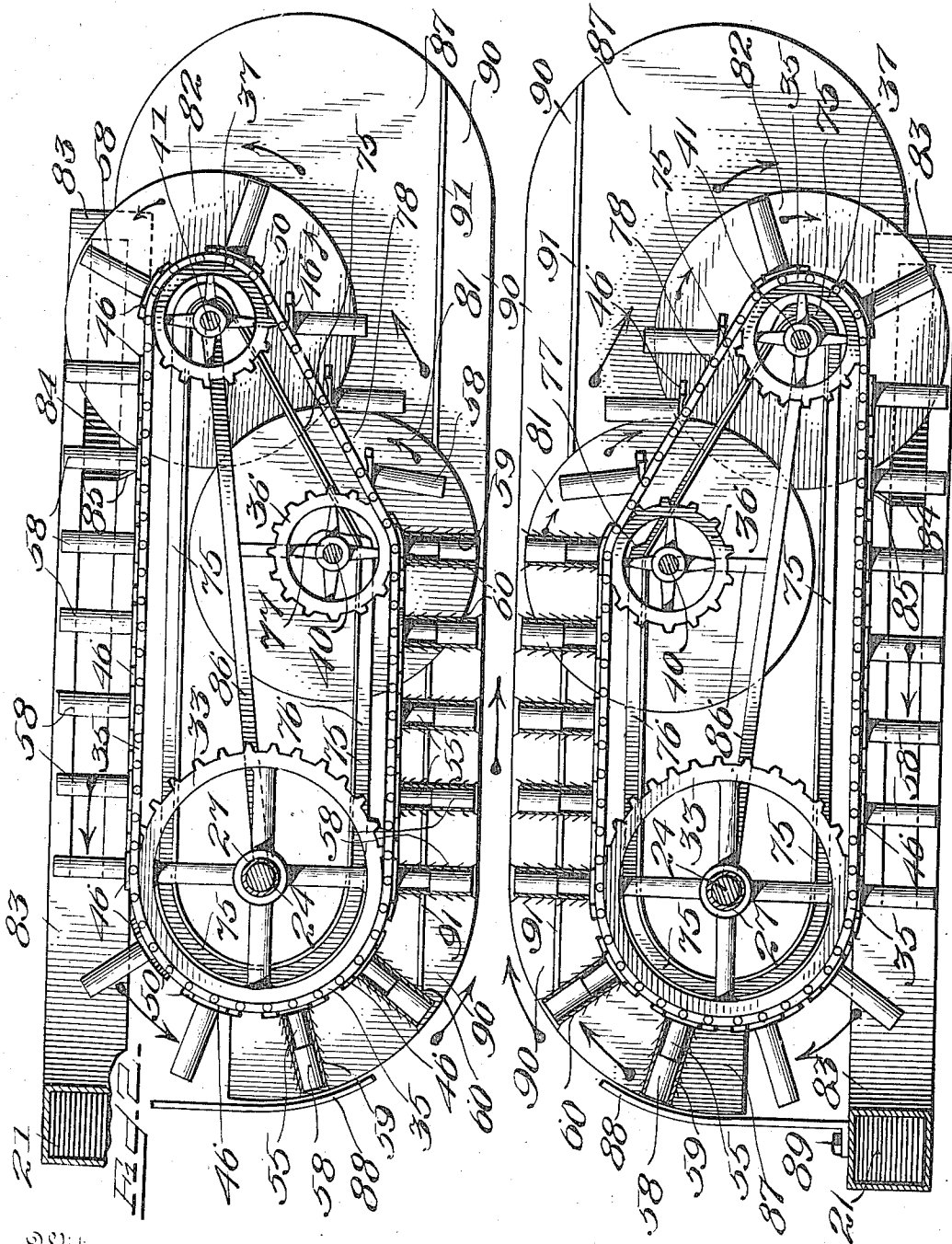
Inventor:
George Lispenard
By his attorney
Robert H. Walker

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Witnesses:
C. S. Ashley
B. S. Daniels

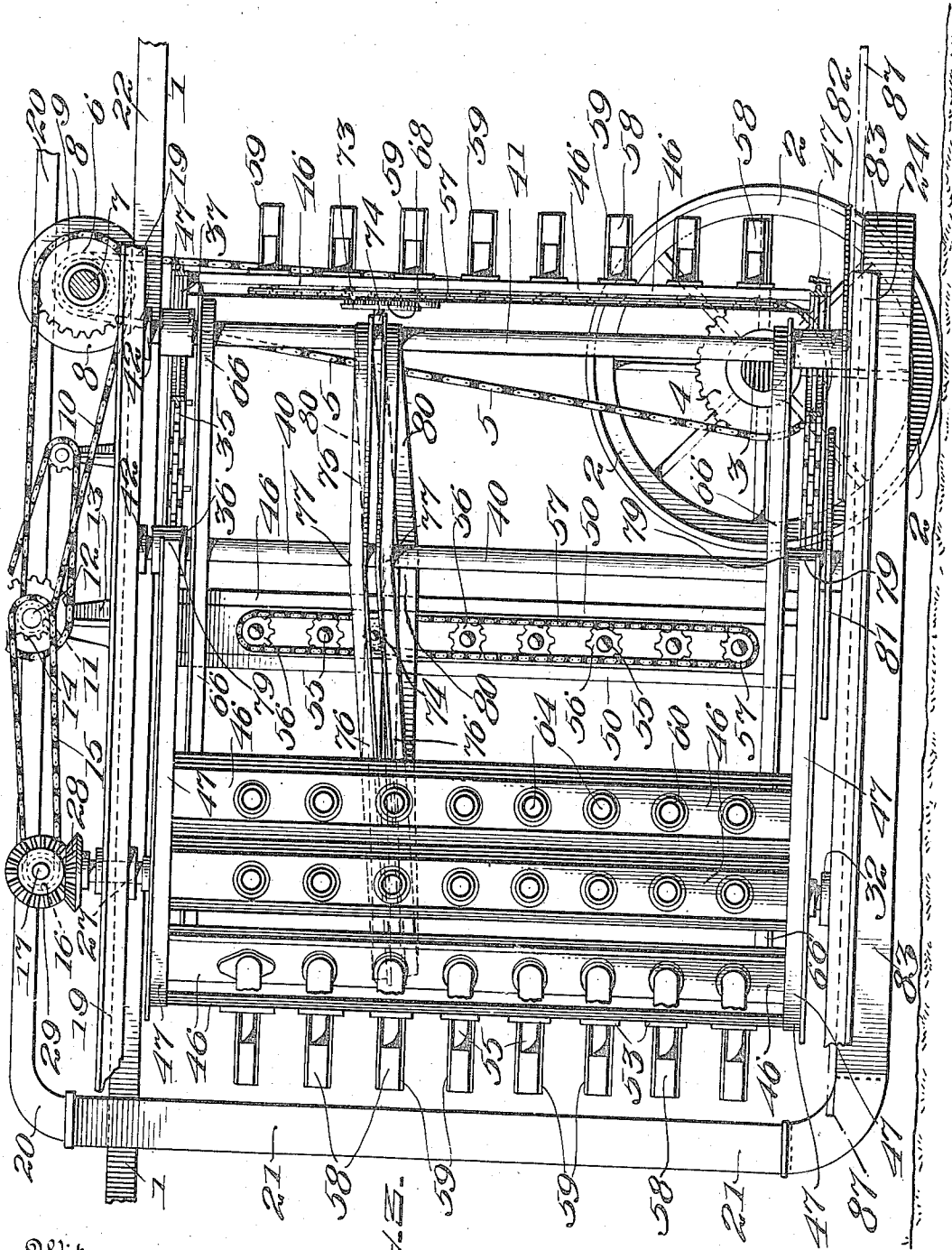
Inventor
George Lisperard
By *Robert W. Ashley*

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5 SHEETS—SHEET 3.



Witnesses:
G. S. Ashley
B. S. Hamble

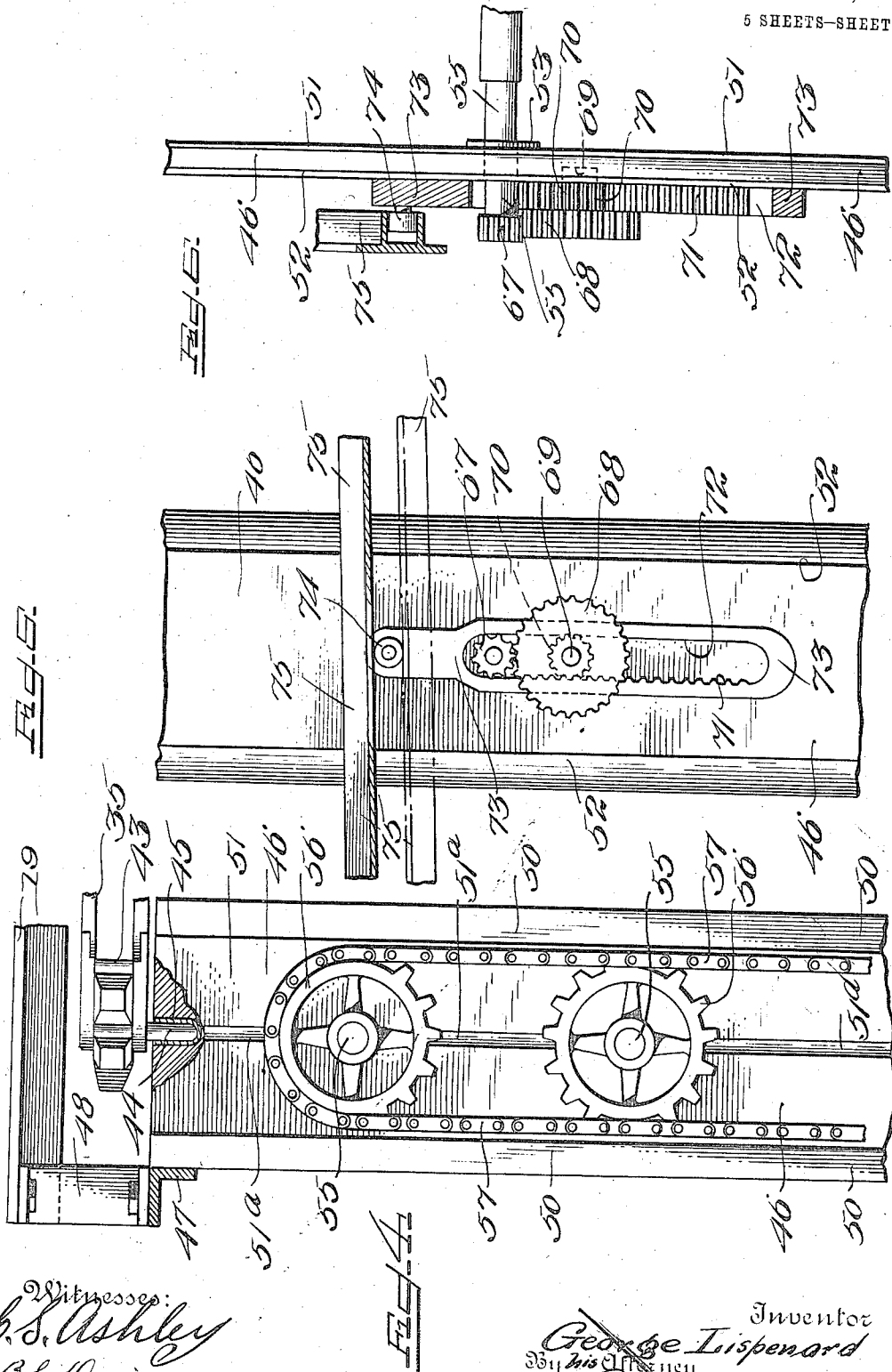
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5 SHEETS—SHEET 4.



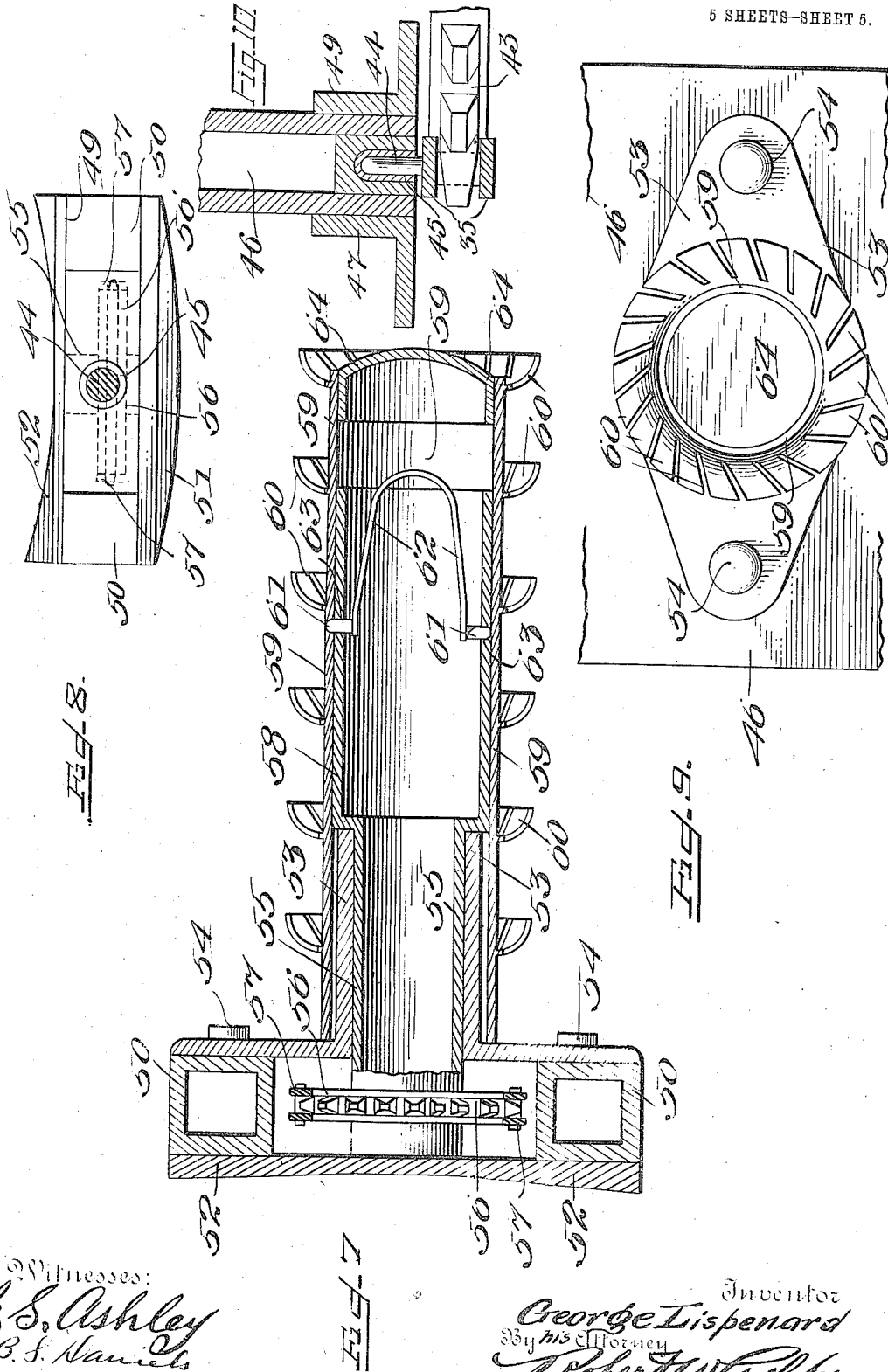
Witnesses:
B.S. Ashley
B.S. Daniels

Inventor
George Lisperd
By *his Attorney*
Robert W. Ashby

976,084.

Patented Nov. 15, 1910.

5 SHEETS-SHEET 5.



Witnesses:
G. S. Ashley
B. S. Daniels

Inventor
George Lispernard
By his Attorney
Robert W. Kelley

UNITED STATES PATENT OFFICE.

GEORGE LISPENARD, OF BROOKLYN, NEW YORK, ASSIGNOR TO S. K. LICHTENSTEIN,
TRUSTEE, OF NEW YORK, N. Y.

COTTON-HARVESTER.

976,084.

Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed January 12, 1909. Serial No. 471,892.

To all whom it may concern:

Be it known that I, GEORGE LISPENARD, residing at Brooklyn, in the county of Kings and State of New York; have invented certain new and useful Improvements in Cotton-Harvesters, of which the following is a specification.

This invention relates to improvements in cotton harvesters having particular reference to apparatus adapted to travel over the rows of cotton bushes under its initial motive power, the operative parts of said apparatus and means associated therewith being actuated to pick or strip said cotton bushes of the ripe cotton thereon, obviating the disturbance of the unripe cotton and all possible injury to the cotton plant or bush.

One object of the invention is the providing of means carrying a plurality of rotative pickers between which the cotton bushes are received as the apparatus travels along or over the rows of plants, having also associated therewith means for feeding or guiding said plants in the path of said pickers, and means for controlling the positions of said rotative picker supporting means for preventing the barking or tearing of said cotton plants by the actuated operative means of the apparatus.

Another and further object of the invention is the providing of means associated with said picker means adapted to facilitate their picking or stripping capacity and means for actuating one of said pickers whereby all or a plurality of pickers of a predetermined series are actuated from one or a common point.

In the following is described in connection with the accompanying drawings, one embodiment of the invention, the features thereof being more fully described hereinafter in the claims.

In the drawings, Figure 1 is a vertical cross sectional view of the picker carrier supporting and actuating means of the apparatus, parts being shown in elevation to more clearly illustrate the essential features of the operative parts thereof; Fig. 2 is a plan view of the picker actuating means illustrating in connection therewith the means of removing or cleaning said pickers after the picking operation, the means of collecting and conveying the picked or recovered values of cotton and means of finally conveying said recovered cotton to a

suitable source of deposit; Fig. 3 is a longitudinal elevation of said picker, supporting and actuating means, parts thereof being broken away and showing in part by diagrammatical illustration the main supporting frame, auxiliary or picker carrier supporting frame and motive or traction power generating means; Fig. 4 is a detail face elevation of one form of picker bar illustrating the picker actuating means and means for pivotally supporting said bar on the picker bar supporting and conveying means; Fig. 5 is a detail face elevation of the rotative picker actuating mechanism. Fig. 6 is a detail side elevation of the structure shown in Fig. 5. Fig. 7 is an enlarged detail longitudinal sectional view of one form of picker the bearing and actuating mechanism therefor, illustrating in detail the cupped formation of the toothed or saw disks. Fig. 8 is a detail plan view of the picker bar illustrating the construction utilized to facilitate the travel of said bar on an arc or predetermined curve; Fig. 9 is a detail face elevation of the structure shown in Fig. 7, and Fig. 10 is a detail vertical sectional view of the picker stem supporting bar and guides therefor.

Similar numerals or references indicate similar parts throughout the several views.

In the drawings, 1 indicates the main frame or superstructure of the apparatus, carrying traction means 2 comprising preferably a running gear of the well known motor vehicle type, including a shaft 3 supported by means of suitable structural framework, said shaft 3 having mounted thereon a driving sprocket 4 adapted to receive chain 5, actuated from sprocket 6, mounted on drive shaft 7 of motor 8, said drive shaft 7 being mounted in suitable bearings carried by said superstructure 1. Drive shaft 7 has also mounted thereon sprocket 9 carrying chain 10 engaging sprocket 11 on intermediate drive shaft 12, mounted in bearings 13, supported by superstructure 1, said shaft 12 having also mounted thereon sprocket 14 carrying chain 15 engaging sprocket 16 mounted on picker actuating drive shaft 17, supported in bearings 18, mounted on auxiliary frame or vertically adjustable structure 19; said adjustable structure and means for actuating same, together with said motive power, generating and traction means are only

partially shown herein the object of said non-disclosure being hereinafter described.

Motor 8 has associated therewith vacuum generating means communicating with a
 5 pipe or tube 20, which in turn connects with elevator tube 21 forming part of the cotton collecting and retaining means, said pipe 20 being adapted to convey or carry the collected or recovered cotton to any suitable
 10 source of deposit. Auxiliary frame 19 comprises upper and lower transverse beams 22 and 23 having mounted thereon supporting rods 24, carrying on their lower ends longitudinal braces 25 which in turn have
 15 rigidly fastened thereto uprights 26, said uprights 26 comprising the frame supporting means for the vertical adjustment or the lifting and lowering of the cotton picking mechanism. Said rods 24 have loosely
 20 mounted thereon sleeves 27 carrying at their extreme upper ends beveled gears 28 meshing with gears 29 mounted on drive shaft 17 and controlled by means of clutch 30. Rods 24 are supported at their upper ends
 25 by means of bracket bearings 31, and at their lower ends by bearings 32 mounted on and forming part of auxiliary frame 19 and in its adjustment allowed to travel therewith. Sleeves 27 are supported in any suitable
 30 manner in frame 19 and have mounted thereon driving sprockets 33 slightly below transverse beam 22, and sprockets 34 slightly above beams 23 carrying sprocket chains 35, engaging in their circuits idler sprockets 36
 35 and 37 at the top of the structure and idler sprockets 38 and 39 at the bottom of said structure, said idlers 36 and 38 being mounted on shaft 40 and idlers 37 and 39 being mounted on shaft 41, said shafts 40 and 41
 40 being supported at their extreme ends in bearings 42, also mounted on beams 22 and 23. Chains 35 have mounted in links 43 pins 44 adapted to engage sockets 45 Figs. 1 and 4 formed or mounted in the upper
 45 and lower ends of picker supporting bars 46, the object of said pivotal supporting means for said bars being to provide means whereby said bars may be free to turn at a predetermined point in the circuit of their
 50 travel.

Driving sprockets 33 and 34, described above, as carrying chains 35 passing over the set or series of idler sprockets and bars 46 are adapted to run in guides 47 supported by means of hanging brackets 48
 55 on said transverse beams 22 and 23, which also support at both the upper and lower portions of the picker actuating mechanism interior guides 49, the object of said guides 47 and 49 being to provide means whereby chains 35 carrying bars 46 may be compelled or forced to travel in a rigid position, retaining means obviating all possible
 60 lateral or side motion while the apparatus is in operation.

Picker bars 46 comprise two vertically set tubes 50, having mounted on their face thereof a convex plate 51 having cut therein an oil groove 51^a for lubricating purposes and on their backs concave plates 52, the object
 70 of the same being to provide face and back members that will readily conform to the contour or face of the surface over which said bars travel. Said face plates have mounted thereon a plurality of bearings 53
 75 fastened thereto by means of bolts 54, said bearings 53 having in turn mounted therein sleeves or shafts 55 having mounted on their outer ends between said plates and tubes, sprockets 56 carrying a chain 57 adapted to
 80 engage all of the sprockets 56 mounted on the inner ends of the several sleeves, the outer ends of the sleeves forming bearings and holding surfaces 58 for picker stems 59 having suitably mounted thereon or cast
 85 therewith cup shaped slotted picker disks 60. Picker stems 59 are held in place on said bearings 58 by means of lugs 61 on hand springs 62 engaging holes 63 in the respective members thereof, the extreme outer end
 90 of said stems being closed by means of plug 64. Said picker bars 46 have mounted on their inner sides at their upper and lower ends roller bearings 65, engaging the interior
 95 surfaces of supporting guides or rails 66 supported by structural frame attached to said transverse beams 22 and 23 in any suitable manner, the object of said roller bearings 65 being to provide means for preventing said picker bars from sagging, being
 100 thrown, or from being jarred out of their predetermined course of travel which would necessarily tend to create a drag on the operative parts of the picker actuating mechanism.

The apparatus as herein shown and described is designed to travel between the rows of cotton bushes or plants, one row of said bushes being fed between or intermediate of the picker frames, said frames being
 110 raised or lowered at will within approximately two inches of the ground line, the hills or tufts of earth passing between and sometimes touching the guides and protecting plates or shields of the apparatus, the
 115 upper portion of said bushes or plants or that part bearing the ripe and unripe cotton bolls, including the stems and leaves, being forced to come in contact with and passing through the actuated picker stems
 120 carried by the traveling picker bars.

The sleeves or shafts 55 on preferably every third picker stem on each of said picker bars 46 are longer than the other of said sleeves and extend through the rear
 125 plate 52 and have mounted thereon gears 67 engaging pinions 68 supported on stud shafts 69 mounted in bars 46. Said shafts 69 have also mounted thereon stud pinions
 70 engaging racks 71 formed on the inte 130

rior sides of slots 72, cut or formed in driving slides 73, having mounted therein at their extreme upper ends roller bearings 74 engaging tracks 75, supported by means of frame 19 or fastened to interior guides 49. Said tracks 75 starting at the center of the arc or circumferential guide of drive sprockets 33 are mounted or set in approximately a fifteen degree pitch or are diagonally inclined as at 76, said pitch ending at the extreme of the parallel as at 77, said tracks at this point following the horizontal axis of the supporting members of the frame. Where the pitch of said tracks 75 ends, indicated as at 77, the apparatus and frame therefor recede, as at 78, the frame or supporting structure of the device flares outwardly as shown in Fig. 2 of the drawings, guides 47 and 49 being cut away at the termination of the said pitch as at 79, permitting at this point picker bars 46 carrying the rotating picker stems 59 to turn at will, and cease rotation providing means of releasing any part of the plant, obviating all possible injury to the stems or leaves of said plant; said picker stems 59 retaining the cotton as extracted from the ripe bolls until said bars 46 have traveled till they reach the outside picker actuating means, wherein in this instance roller bearings 74 travel downwardly in track 75 indicated as at 80, toward the front of the device, thus reversing the rotation of said picker stems 59 said reverse rotation being faster than the speed of direct rotation, which causes the cotton as picked and held by them to be thrown therefrom, whence it falls upon rotating disks 81 and 82, mounted on and actuated by shafts 40 and 41. After the cotton is thrown upon disks 81 it is carried by the rotation thereof to disks 82 which in turn carry it to conveyor tubes 83 having formed therein openings 84 and deflector guides 85 adapted to feed the cotton into said openings 84, whence it is carried by said tubes 83, connecting with elevator tubes 21 at the front end of the apparatus by means of the vacuum generated and controlled by means as heretofore described.

The structure illustrated and referred to as track 75 acts as a deflector causing the cotton as collected by conveyor 71 to fall upon the upper surface of conveyor 82 whence it is conveyed to the vacuum conveying means.

Shafts 24, 40 and 41, described above as carrying the respective actuating sprockets, are supported by means of spider frame 86. Interior guides 47 of the vertical adjustable frame have suitably fastened thereto platforms 87 directly beneath the rotative picker stems 59 on the inner sides of the apparatus, extending forward a suitable distance in the rear of guards or deflectors 88, supported on vertical elevator tubes 21 by means of

bolts 89, the rear of said platforms 87 flaring outwardly, forming at that point suitable reception surfaces for collecting and retaining the particles of cotton that are discharged or jarred from the rotative cotton conveying disks 81 and 82. The inner edges 90 of said platforms 87 are hinged as at 91, providing a resilient guiding body for the stems and short runners or shoots of the cotton plant or bush.

The operation of the device is as follows: The device as herein shown and described is designed to travel between the rows of cotton bushes or plants by its own momentum or by a suitable vehicle traction means, the guards 88 and guides 90 thereof feeding or forcing the plants or that portion thereof containing the ripe and unripe cotton bolls, stems and leaves in the path of a plurality of rotative picker stems 59, having mounted thereon the cup shaped slotted picker disks 60; which extract and collect all of the cotton contained in the ripe bolls, the unripe bolls, stems and leaves of said plant or bush being protected from disturbance, removal or injury by means of the particular formation and position of the actuated rotative cotton pickers on said picker bars 46 during the picking positions of the apparatus, the direction of travel of said picker means being illustrated by the arrows shown in Fig. 2 of the drawings. In case a small portion of the picked cotton should be dropped from said picker stems 59 it is carried to rotating conveyers 81 and 82 where all of the picked cotton is compelled to fall by means of the reversed rotation of said picker stems, whence it is conveyed by said conveyers 81 and 82 to tubes 83 which in turn carry it to a suitable source of deposit by means of a vacuum or other means. The picking capacity of the apparatus starts at approximately the beginning of the parallel portions of the paths of the picker stems and ends at 79, the picker bars 46 carrying the plurality of picker stems 59 being thereafter free to turn at any angle until the actuating means therefor engages the guide tracks on the outside of the respective sections; the object of the same being to provide means for overcoming rigid lateral movements of said picker stems after they have passed beyond their picking positions, thus obviating any possible drag on any portion of the plant, at the same time rendering the apparatus less liable to injure the stems, leaves, unripe bolls or any portion of the body of said plant. The series of picker stems carried by each of said picker bars 46 are actuated by means of gear engaging pinion 68 on stud shaft 69, which in turn carry stud gears 70 operating in racks 71 actuated and moved vertically by means of roller bearings 74 engaging in track 75, said operation being forced by

means of the travel of the individual picker bars 46 pivotally mounted on chains 35 driven by means of sprockets 33 and 34, which in turn receive their initial power 5 through a series of transmission gears 28 and 29 mounted on shafts 17 and 27, said shaft 17 being actuated from motor 8 by means of suitable chain or shaft drive and controlled by means of said clutch 30.

10 Matter not shown, described, or claimed herein but referred to, is reserved, being shown, described and claimed in applicant's co-pending applications Serial No. 334092, filed September 1st, 1906, and Serial No. 15 407323, filed December 20th, 1907.

It is obvious that the apparatus as shown and described herein may be varied in many ways, particularly in structural features and form, size, materials used, specified operations and power generating means without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent of the United States is:

1. An apparatus of the character described, comprising a main frame, traction means, motive power generating means, an auxiliary frame mounted in said main frame, power transmitting means carried by said auxiliary frame actuated from said power generating means, chains associated therewith, a plurality of vertically set bars pivotally mounted on said chains, guides therefor, a plurality of rotative pickers mounted on said bars, means for actuating said pickers simultaneously from one or a common point, means for guiding and controlling the positions of said rotative pickers, means for rotating said pickers in a reverse direction and discharging the cotton picked thereby, a primary collector means, a secondary collector means, means for recovering the cotton gathered by said collector means, and means for guiding the body of the plant or bush in the path of said rotative pickers.

2. An apparatus of the character described, comprising a main frame, traction means mounted thereon, power generating means associated therewith, a vacuum generating means an auxiliary frame, means for supporting said auxiliary frame vertically within said main frame, driving shafts carried by said auxiliary frame driven from said power generating means sprockets mounted thereon, traveling chains carried by said sprockets, pivotal supports mounted on said chains, a plurality of vertically set bars mounted in said pivotal supports, guides for said bars, a plurality of rotative bearings mounted on each of said bars, picker stems mounted on said rotative bearings and free to turn therewith, means for rotating one of said bearings to simultaneously actuate all of said bearings, guides for said rotative bearing actuating means, means for imparting an oscillatory movement to said bars on

said support, a plurality of cupped disks mounted on each of said picker stems adapted to extract the cotton from its boll, means for rotating said picker stems in a reverse direction and discharging the cotton gathered thereby, means for guiding a plant or bush in the path of said rotative picker stems, rotative conveyer means actuated from said picker traveling and operating means, stationary conveyers, means for drawing the cotton through said stationary conveyers by means of the vacuum generated by said power generating means, and a platform carried by said auxiliary frame provided with a hinged guide for the cotton plant or bush adapted to recover the cotton discharged from said pickers and conveyers.

3. An apparatus of the character described, comprising a main frame, motor vehicle means associated therewith, an auxiliary frame supported vertically within said main frame, a driving shaft mounted on said auxiliary frame actuated by said motor vehicle means, driving means on said driving shafts vertically mounted shafts provided with actuating means engaging the driving means on said driving shafts, sprockets mounted on said vertically set shafts, chains engaging said sprockets, pivotal supports carried by said chains, a plurality of supporting bars mounted on said pivotal supports, bearings mounted on said bars, a plurality of rotative sleeves mounted in said bearings, picker stems mounted on and free to turn with said sleeves, cupped disks provided with a plurality of slots mounted on said stems, guide tracks supported by said auxiliary frame a portion of each of said tracks being horizontally disposed and other portions being inclined, roller bearings on said bars engaging said tracks, driving racks mounted on each of said bars, means mounted on certain of said picker stem sleeves engaging said racks, sprockets mounted on each of said sleeves, chains carried by said sprockets, the travel of said bars being adapted to actuate one of said picker stems and cause the simultaneous forward and reverse rotation of all of said pickers, rotative collector and conveyer means, a stationary collector means adjacent to and adapted to receive the cotton from said rotative collector and conveyer means, a platform provided with a resilient receiving surface adapted to feed the cotton bush in the path of said rotative pickers and to recover the cotton discharged by said rotative collector and conveyer means, guards supported by said main frame adapted to force the spreading parts of a cotton bush in the path of said pickers, and means for releasing said bars from their traveling guides to prevent barking or tearing of the body of said cotton bush.

4. An apparatus of the character de-

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scribed, including a main frame an auxiliary frame mounted within said main frame comprising depending sections adapted to have pass between them a row of cotton bushes, 5 shafts carried thereby, means for actuating said shafts, sprockets mounted on said shafts, chains carried by said sprockets, pivotal supporting means associated with said chains, a plurality of vertically set bars mounted on 10 said pivotal supports, a plurality of rotative pickers mounted on said bars, cam tracks mounted in each of said depending sections, means actuated from one of said rotative pickers on each of said bars engaging said 15 cam tracks for actuating all of said pickers on each bar simultaneously, means for reversing the rotation of said pickers for discharging the picked cotton therefrom, platforms carried by each of said sections, rotative collectors and conveyers mounted in 20 each of said sections, stationary conveyers adjacent to each of said rotative collectors and conveyers, and means for recovering and conveying the cotton collected by said 25 conveyers.

5. An apparatus of the character described including a main supporting frame, a depending frame mounted on said supporting frame comprised of two independent sec-

tions, and a picker stem actuating means 30 mounted in each of said independent sections comprising a guide track and roller bearings adapted to engage said guide track, a portion of each of said tracks being hori- 35 zontally disposed and other portions thereof inclined, racks associated with said roller bearings, picker stem supporting means, ro- 40 tative picker stems mounted in said supporting means, driving means on each of said picker stem supporting means engaging said racks, and means mounted on one of 45 said rotative picker stems, engaging said driving means and means operatively connecting the last named picker stem with the other picker stems, the travel of said roller 50 bearings on said tracks in one of said inclined portions causing rotation of said picker stems in a forward direction and the travel of said roller bearings in the other of said inclined portions causing the reverse rotation of said picker stems.

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

GEORGE LISPENARD.

Witnesses:

W. F. ASHLEY,

H. W. REMINGTON.