

No. 768,400.

PATENTED AUG. 23, 1904.

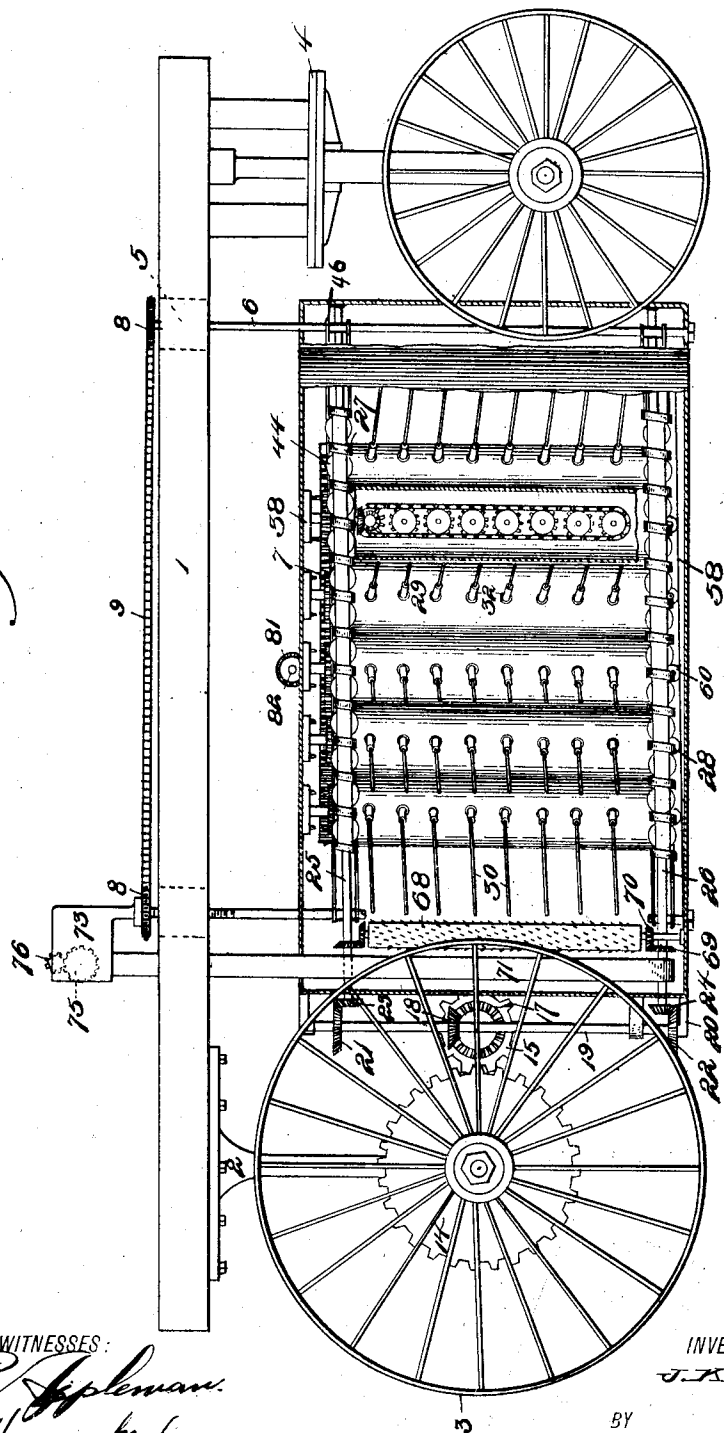
J. K. PIPER.
COTTON PICKER.

APPLICATION FILED APR. 28, 1898.

NO MODEL.

6 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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A. Haymaker.

INVENTOR

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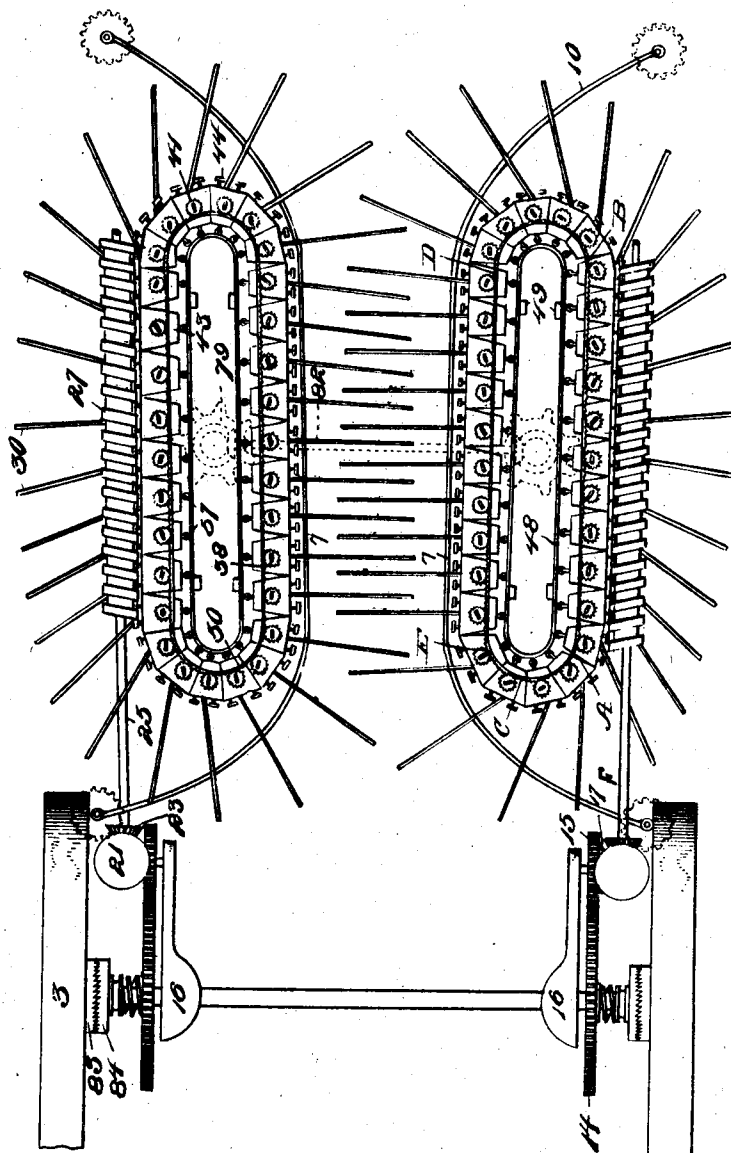
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NO MODEL.

6 SHEETS—SHEET 2.

Fig. 2.



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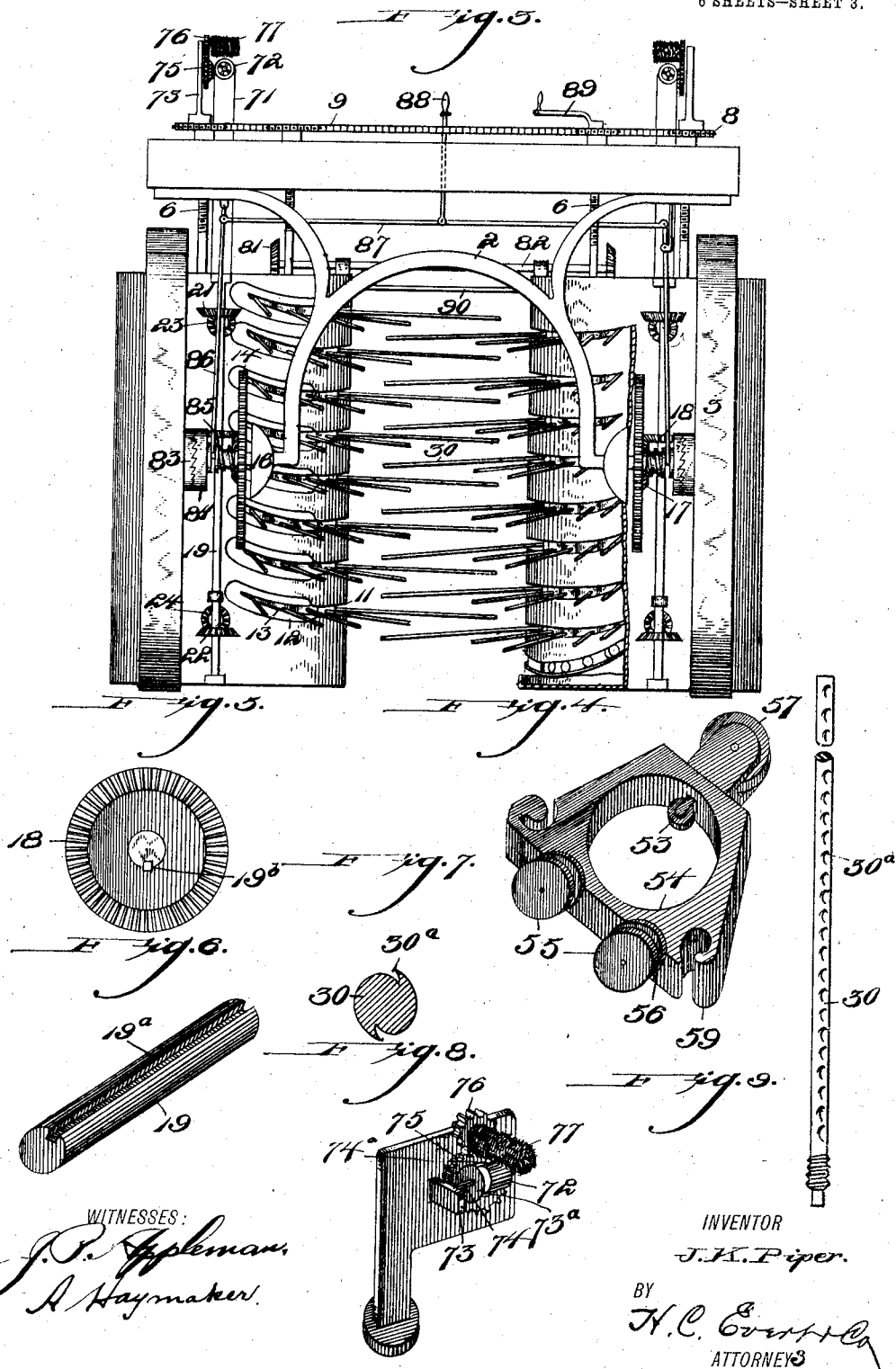
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6 SHEETS—SHEET 3.



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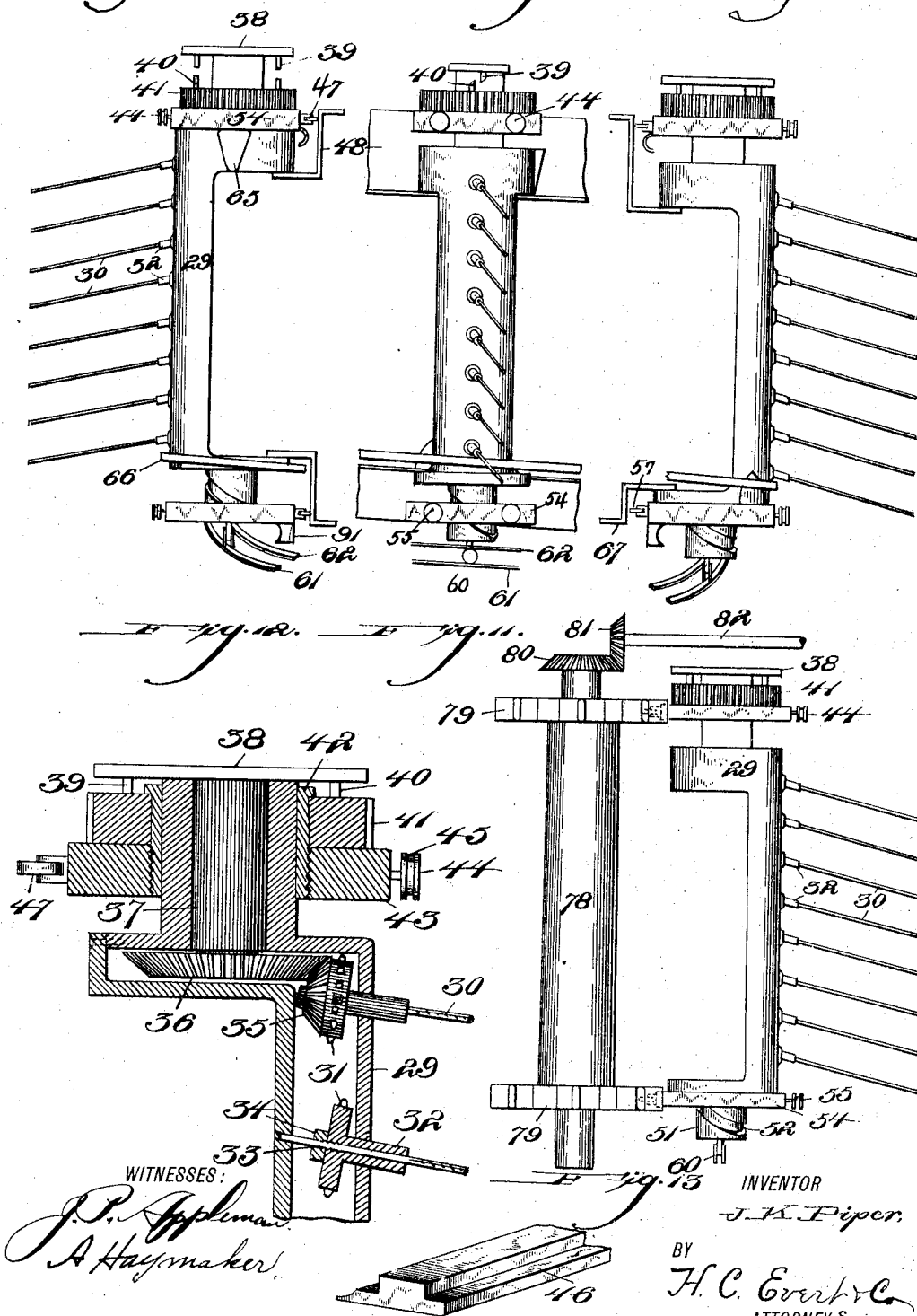
NO MODEL.

6 SHEETS—SHEET 4.

Fig. 10

Fig. 10. a

Fig. 10^b



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6 SHEETS—SHEET 5.

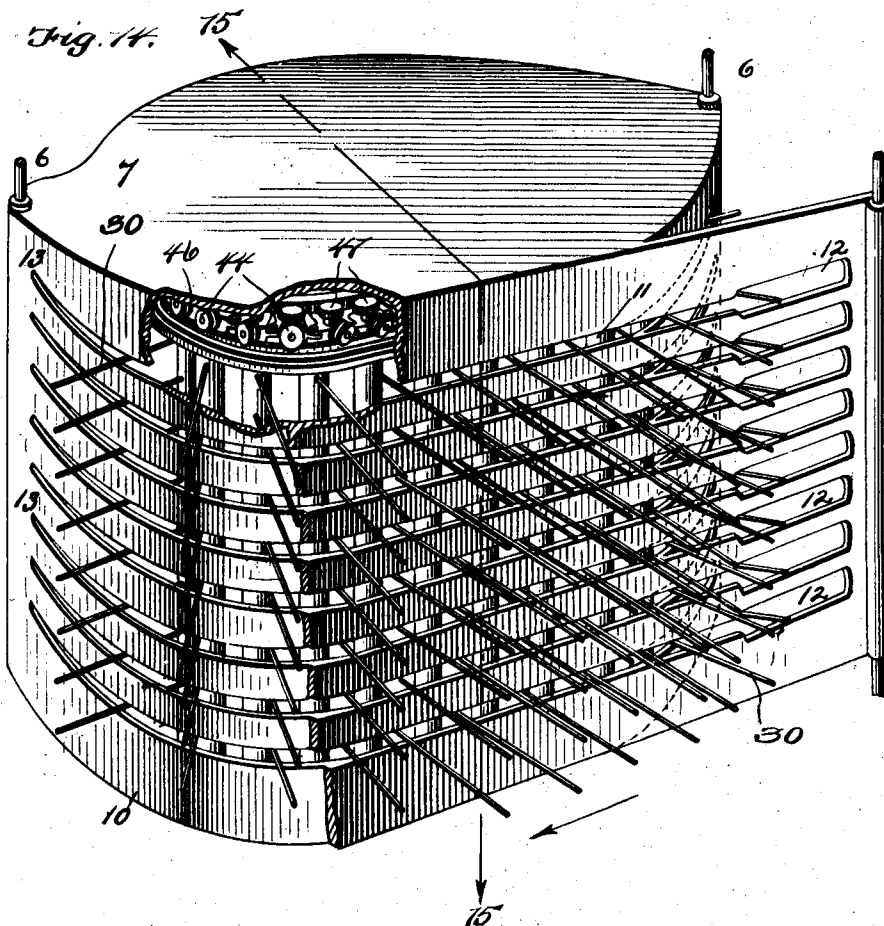
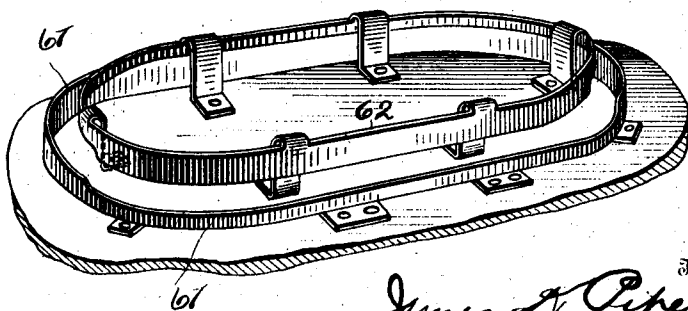


Fig. 16.



Witnesses

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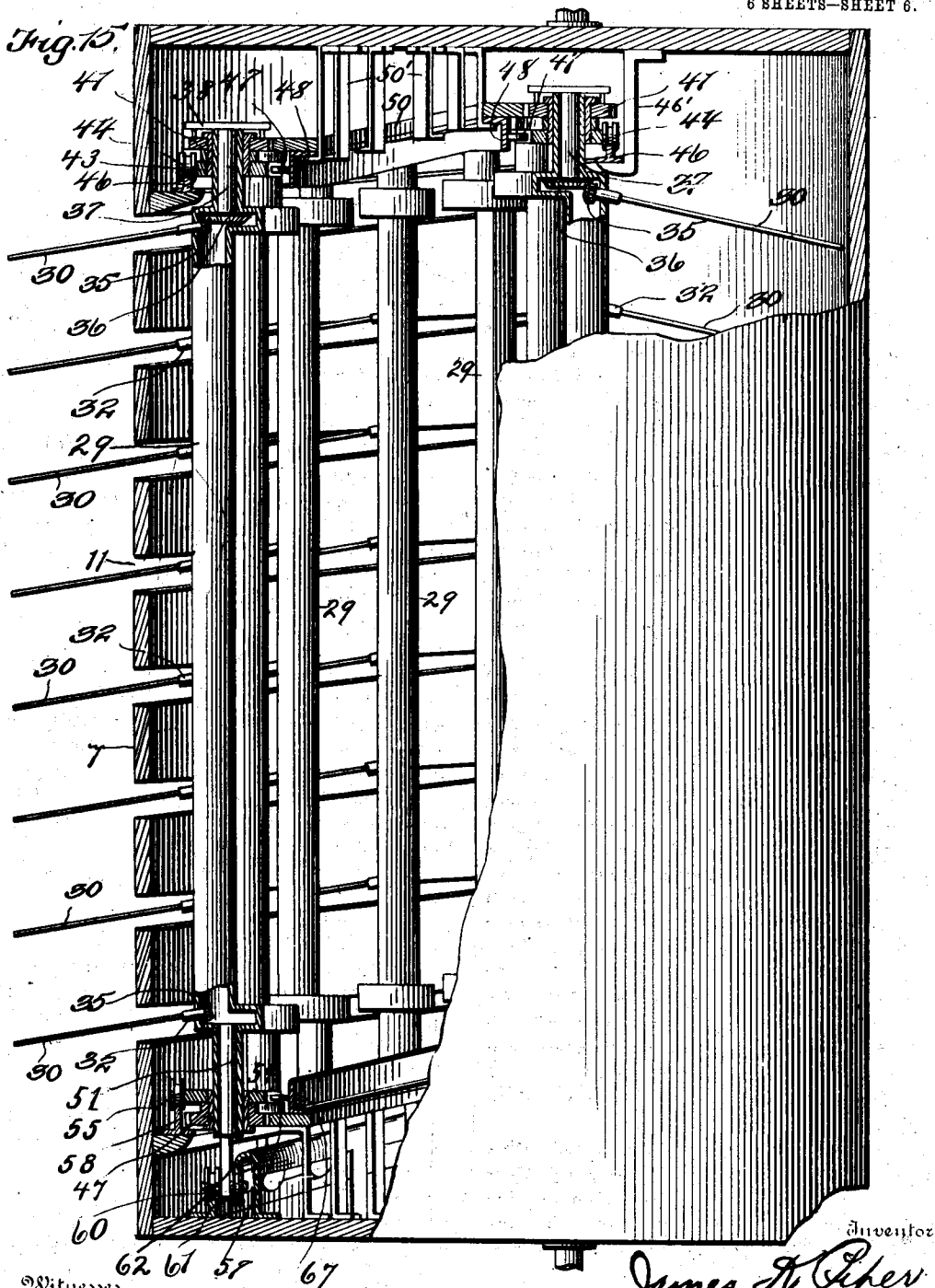
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J. K. PIPER.
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APPLICATION FILED APR. 28, 1898.

NO MODEL.

6 SHEETS—SHEET 6.



Witnesses

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J. J. Jones

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James K. Piper
Attorney

UNITED STATES PATENT OFFICE.

JAMES K. PIPER, OF WILMERDING, PENNSYLVANIA.

COTTON-PICKER.

SPECIFICATION forming part of Letters Patent No. 768,400, dated August 23, 1904.

Application filed April 28, 1898. Serial No. 679,122. (No model.)

To all whom it may concern:

Be it known that I, JAMES K. PIPER, a citizen of the United States of America, residing at Wilmerding, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Cotton-Pickers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in cotton-pickers, and has for its object to construct a machine for this purpose that will effectually pick and deposit the cotton from the open bolls within a suitable receptacle, performing this operation without injury to the green bolls, blooms, or stalks of the cotton-plants.

The invention has for its further object to construct a machine for this purpose that may be readily adjusted vertically, so as to conform to the height of the cotton-plants.

The machine is also provided with a lid which serves to depress such plants as may be too high to have the picker-fingers engage the bolls; further, a machine having a series of fingers to engage the open bolls, together with the novel construction for operating these fingers in such a manner as to assure their effectual engagement with the open boll.

The machine is also provided with novel means for removing the cotton from the picker-fingers after the latter have removed the same from the bolls, which construction, together with the aforementioned, will all be hereinafter specifically described, and particularly pointed out in the claims.

In describing the invention in detail reference will be had to the accompanying drawings, forming a part of this specification, and wherein like figures of reference indicate similar parts throughout the several views, in which—

Figure 1 is a side view of my improved cotton-picker with the casing partly in section to show the interior construction. Fig. 2 is a top plan view. Fig. 3 is a rear elevation with the casing partly broken away to show the mechanism. Fig. 4 is a perspective view of one of the carrier-frames. Fig. 5 is a plan view of the adjustable gear mounted

upon the slotted vertical shaft. Fig. 6 is a perspective view of a portion of the slotted vertical shaft. Fig. 7 is a cross-sectional view of one of the fingers. Fig. 8 is a perspective view of the removing-brush and its supporting-bracket. Fig. 9 is a side view of one of the fingers partly broken away. Figs. 10, 10^a, 10^b are detail side views of the finger-carriers, showing the carrier-frames in three different positions. Fig. 11 is a detail side view of one of the finger-carriers, showing the auxiliary driving means. Fig. 12 is a sectional view of a portion of one of the finger-carriers, showing carrier-frame and driving means also in section. Fig. 13 is a perspective view of a portion of one of the oval-inclined tracks for the carrier-frames and which is supported by the hanger-rods. Fig. 14 is a view in perspective of one of the guards or casings partly broken away to show the inclosed mechanism. Fig. 15 is an enlarged vertical sectional view of a part of one of the guards or casings, showing part of the mechanism inclosed therein. Fig. 16 is a detail perspective view of part of the bottom of one of the casings, showing the tracks or ways thereon.

Referring to the drawings by reference-figures, 1 denotes the two side rails, which are supported at the rear end by a brace 2, formed integral with the axles, for the rear or drive wheels 3. At their forward end these side rails are supported from the front axle and are or may be provided with a suitable fifth-wheel 4.

The side rails 1 are connected together by cross-pieces 5, which receive the front and rear pair of hanger-rods 6, passing through and supporting the casings or guards 7, which protect the operating mechanism. These casings or guards extend longitudinally of the machine and diverge outwardly slightly toward their forward end, so that the distance between the same at the point where the picker-fingers enter is greater than at the point of exit for said fingers. The guards are operated vertically by the aid of the hanger-rods 6, which are screw-threaded on that portion engaging the cross-pieces 5 and each of which carry on their upper ends a sprocket-

wheel 8 to be engaged by an endless drive-chain 9. The endless drive-chain 9 surrounds all the sprockets 8, and by drawing the drive-chain in one direction or the other all the sprocket-wheels 8 will be turned simultaneously in one direction or the other, according to the direction of movement of the drive-chain, and the guards thereby elevated or lowered. At each end of the operating mechanism on each side of the machine the casings or guards are provided with forwardly and rearwardly extending curved branches 10, which are provided with slots 11 to receive the picker-fingers, for which they act as guides. These slots terminate at the rear in larger openings 12, so that the accumulated cotton on the finger may not be removed by its engagement with the guards. These slots or runways 11 for the fingers are in alinement with the slots or runways 13 provided therefor in the ends of the guards at the rear of the operating mechanism, said slots or runways curving in the same radius as is described by the picker-fingers in their operation and being reduced gradually to a point at their ends, so that the cotton accumulated upon the fingers will be removed thereby.

Mounted upon the rear axles are gears 14, which are adapted to mesh with and operate spur-gears 15, supported on a bracket 16, carried by the rear axle. These spur-gears 15 have cast integral therewith or otherwise suitably secured thereto a bevel-gear 17, which engages and operates a miter-gear 18, mounted upon the vertical shaft 19. This shaft 19 is journaled in a bracket 20, carried by the base of the inclosing casing, said shaft having mounted thereon miter-gears 21 22, the former engaging gear 23 and the latter engaging gear 24 of the two shafts 25 and 26. These two shafts 25 26 are supported by the guards 7, in which they are journaled, and they carry thereon or have a portion thereof formed into operating-worms 27 28, these worms turning with the shafts 25 26 and serving to impart motion to the carrier-frames, as will be hereinafter described. In order to secure the perfect meshing of the gears 17 and 18 at all times, as may be required by the adjustment of the machine, I provide the vertical shafts 19 with a longitudinally-extending slot 19^a, Fig. 6, to receive the sliding key 19^b, Fig. 5. The finger-carriers 29 are hollow, and each finger 30 secured in said carriers has a sprocket 31, Fig. 12, mounted upon a hub 32, which is journaled in the front wall. For the purpose of securing the finger firmly within its hub I may provide the same with a threaded portion 33, which engages in the hub, and then place a jam-nut 34 on the finger at the rear of the sprocket-wheel and engaging said threaded portion. On each upper finger of each carrier is mounted a bevel-gear 35, which meshes with a like gear 36, carried by shaft 37, which

carries on its upper end the clutch 38. This clutch 38 carries clutch-pins 39, which engage clutch-pins 40, carried by the spur-gear 41, loosely mounted upon a sleeve 42, the latter being loosely mounted on the hub in which the shaft 37 operates. This sleeve 42 is provided on its lower half with exterior screw-threads to receive the upper carrier-frame 43. This upper carrier-frame 43 has on its one side two rollers 44, the axis of which is horizontal and each of which is provided with peripheral grooves 45, which receive the oval inclined upper tracks or guides 46. These tracks or guides 46 are supported by the hangers 46', depending from the casing 7. The upper carrier-frames 43 also carry on the opposite side from the rollers 44 a roller 47, which is mounted with its axis vertical and which engages an oval inner track 48, supported by vertical standards attached to the base of the inclosing casing. The spur-gear 41, carried by each one of the carrier-frames 43, engages an oval-shaped and inclined rack 50, which is or may be supported from the hangers 50', depending from the casing 7. The rollers 44 are engaged by the worm 27, communicating motion to the carrier-frames 43 and carrier 29. The lower end of the carriers 29 is formed into a hub 51, provided with a spiral groove 52, which is adapted to receive a roller 53, mounted vertically within the aperture which receives said hub. These lower carrier-frames 54 are likewise provided with two horizontally-mounted rollers 55, having the peripheral grooves 56 and the oppositely-disposed roller 57. The rollers 55 travel upon the lower track 58, which is of the same style as the upper track 46, the tread of said tracks engaging in the peripheral grooves of the horizontally-mounted rollers of both the upper and lower carrier-frames. Both of these tracks are slightly inclined upwardly toward the forward part of the machine. The said rollers 55 are engaged by the lower worm 28 and motion communicated to the lower carrier-frames thereby. The upper carrier-frames 43 and the lower carrier-frames 54 are each provided with hooks or knuckles 59, Fig. 4, by means of which they may be hooked together, so as to act as a continuous chain. On the lower end of the hubs 51 is mounted a roller 60, which travels on the track 61 arranged therefor. The shafts 25 26 also communicate the motion to the rotary comb 68 by means of bevel-gears 69 on the shafts 25 26 engaging bevel-gears 70, mounted on the shaft which carries said rotary comb. This latter shaft is or may be journaled in the base and top of the inclosing casing. The shaft 26 also carries a pulley to receive the carded belt 71, engaging pulley 72, which is supported by a bracket 73, which is or may be secured on top of one of the rods 6. The shaft 74, which carries pulley 72, also has mounted thereon a bevel-

gear 73^a, engaging a like gear 74^a, formed integral with a spur-gear 75, supported by the bracket 73. This spur-gear 75 in turn meshes with a smaller spur-gear 76, mounted on a shaft that is journaled in the bracket, said shaft also carrying a brush 77 for removing the cotton from the carded belt. It is also my purpose to provide means for communicating motion from the mechanism on the one side to the other side in case the operating mechanism on one side should become disabled, and to this end I arrange centrally of the tracks the two vertical shafts 78, which have sprocket or gear wheels 79 mounted thereon near each end and which are engaged and operated by the wheels 47 and 57, carried by the upper carrier-frames 43 and the lower carrier-frames 54, respectively, when the same are operated. On their upper ends these shafts carry a bevel-gear 80, which engages a twin gear 81, mounted on each end of the transversely-extending shaft 82.

The machine is placed in and out of gear by means of the stationary clutches 83 and the movable clutches 84, mounted on the rear axle. These movable clutches 84 are held normally in engagement with the stationary clutches 83 by springs 85 arranged upon the axles. They are disengaged by the vertical rods 86, connecting at the top to a horizontal rod 87, that is operated by a lever 88, extending to a suitable position for the operator. One of the rods 86 carries a crank 89 to elevate and lower the mechanism, all the said rods operating in unison by reason of the drive-chain 9 engaging the sprocket 8 mounted thereon.

For the purpose of depressing the cotton-stalks and bringing the bolls into position for engagement by the picker-fingers I provide a plate or cover 90 between the guards 7.

In Fig. 7 I show a cross-sectional view of one of the fingers, which shows the same provided with claws 30^a, though I do not wish to limit myself to this form of finger, as suitable engaging points of any form may be employed on these fingers.

Operation: Assuming that all parts have been secured in their respective positions, as heretofore described, and the gear placed in engagement so as to operate the mechanism when the machine is moved forward, the worms 27 and 28 being operated by their connection with the driving mechanism engage the rollers 44 55 and communicate motion to the frames 43 and 54, respectively. These frames, supporting the finger-carriers 29, move the same around their respective upper and lower tracks, while as these finger-carriers are moved they simultaneously through the medium of shaft 37, gears 35 36, and chain connecting the sprocket of the fingers together cause the rotation of the picker-fingers as they are carried through the slots or runways be-

tween the guards. By reason of the worms or screws 27 28 being on an incline extending upwardly toward the front of the machine corresponding to the inclination of the tracks which support the carrier-frames these worms or screws will come into engagement at their rear end (for illustration, at the point marked A) with the rollers of the carrier-frame, said rollers leaving the worms or screws at point marked B. At this time the clutch 38 engages the gear 41 (which although previously rotating as the carrier was moved forward has communicated no motion to the picker-fingers) and causes the clutch to operate the shaft 37 to operate the picker-fingers by the mechanism heretofore described. These picker-fingers are continued in rotation until they reach the lowest point of the two tracks, 46 and 58, (designated at C,) at which time the double rollers 60, riding upon the double tracks 61 and 62, elevate the carrier, and consequently disengage the clutch, so that the rotation of the fingers ceases between the points A and B. Thus it will be seen that as the finger-carriers reach the point B the fingers begin their rotation; but they are being thrust or moved forward on an incline until they arrive at D, the latter being the highest point of the track. The finger-carriers then again begin to descend on the tracks, while at the same time the fingers are traveling downwardly and rearwardly until the carrier-frames again arrive at point C. The carrier, however, begins its elevation at point E, at which time the double roller 60 is at the lowest point of tracks 61 and 62. This movement of the carrier-frames, the carriers, and the picker-fingers draws the latter through the scrapers, which scrape the cotton off the fingers until they leave the scrapers at point F. The cotton gathered upon the fingers being thus removed, the rotary comb 63 receives the same and transmits it to the corded belt, from which it is removed by the brush 77 into the chute or other receptacle provided therefor.

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

1. In a cotton-picker, the combination with the frame, running-gear and driving mechanism, of the two series of carrier-frames hooked together and traveling in an endless course, carriers mounted in said frames, rollers mounted on said frames, operating-screws engaging said rollers, endless tracks to support the frames, said tracks being inclined upwardly in the forward direction of the machine, a series of picker-fingers journaled in each of said carriers, means for imparting rotary motion to said picker-fingers during their movement rearwardly of the machine, means for rocking the carriers as they ride upwardly upon the inclined tracks, and means for transmitting motion from one series of carrier-

frames to the other so as to operate the same simultaneously, substantially as described.

2. In a cotton-picking machine, the combination with the frame, the running-gear and the mechanism, of a pair of guards which are connected to the frame and spaced apart to form a longitudinal passage centrally of the machine and which passage is wider at the forward than at the rear end of the machine, said guards being provided with slots or runways terminating in enlarged openings at the rear of the guards, inclined tracks arranged within the guards, carrier-frames upon the said inclined track, a series of carriers mounted in said frames, a series of picker-fingers journaled in each of said carriers, means for imparting rotary motion to said picker-fingers during the time they are traveling rearwardly of the machine through the longitudinal central passage of the machine, means for causing said picker-fingers to discontinue their rotary motion during a portion of the travel of the carriers, and means for operating said carriers and carrier-frames, substantially as set forth.

3. In a cotton-picking machine, the combination with the frame, the running-gear and the driving mechanism, of an upper and a lower track each of which is arranged at an incline extending upwardly toward the forward end of the machine, a series of upper carrier-frames connected together to travel in an endless course upon the upper track and a series of similar frames connected together to travel upon the lower of said tracks, carriers mounted in said upper and lower frames, a series of picker-fingers journaled in each of said carriers, a pair of guards spaced apart to form a longitudinal passage centrally of the machine, said guards being provided with slots or runways adapted to receive the picker-fingers during the time they are traveling rearwardly of the machine, means for operating said carriers and carrier-frames, means for imparting rotary motion to said picker-fingers while in the said inclined position, means formed in the said casing or guard to remove the cotton from said picker-fingers as they pass from engagement with said guards, and means for removing the cotton from said means, substantially as described.

4. In a cotton-harvester, the combination with a pair of guards spaced apart, of tracks arranged in said guards and being inclined upwardly from their rear ends, carriers supported on said tracks, and rotary fingers carried by the said carriers.

5. In a cotton-harvester, the combination with a pair of guards spaced apart, of carrier-supporting frames connected together, carriers mounted in said frames, revolving picker-fingers mounted in said carriers, rollers journaled on the said carrier-frames, worms journaled in the said guards and adapted to en-

gage the said rollers, and means for operating the said worms, substantially as and for the purpose specified.

6. In a cotton-harvester, a series of carriers provided at their lower ends with external spirally-grooved hubs, carrier-frames adapted to receive the hubs of the said carriers, a roller carried by each of the said frames adapted to travel in the grooves of the said hubs, means for connecting said carrier-frames together, picker-fingers journaled in the said carriers, means for simultaneously rotating said fingers, and means for moving said carriers vertically within the said frames, substantially as and for the purpose specified.

7. In a cotton-harvester, a series of carriers, hubs carried on the lower ends of the said carriers, said hubs carrying peripheral spiral grooves, a series of carrier-frames connected together and receiving the said hubs, another series of carrier-frames connected together and supporting the upper ends of said carriers, inclined tracks adapted to support the said carrier-frames, picker-fingers journaled in the said carriers, means for rotating said fingers, and means for preventing the rotation of the said fingers through the movement of the said carriers, substantially as described.

8. In a cotton-harvester, a series of carriers, carrier-frames supporting the said carriers, tracks adapted to support the said carrier-frames, picker-fingers journaled in the said carriers, means for rotating the said fingers between predetermined points of their travel, and means for moving the said carriers vertically in their frames, substantially as and for the purpose specified.

9. In a cotton-harvester, the combination with a plurality of endless carrier-frames consisting of a series of blocks linked together, ways on which said carrier-frames are movably mounted, and means for causing the carrier-frames to travel along said ways, of carriers mounted in said frames and means for moving said carriers independently of their frames at predetermined points.

10. The combination with the carrier-frames consisting of a series of blocks linked together, ways on which said carrier-frames are mounted, means for causing the carrier-frames to travel along the said ways, of carriers mounted in said frames, picker-fingers mounted in said carriers, cooperating clutch members carried by said carrier-frames and carriers respectively, and means for raising and lowering the carriers, whereby the clutch members are actuated.

11. In a cotton-harvester, the combination with the running-gear, and the frame mounted thereon, of guards mounted on the frame and spaced apart, inclined tracks mounted in the said guards, an inclined rack mounted in each guard above the inclined tracks thereof, upper and lower carrier-frames mounted upon

the said inclined tracks, carriers supported in
the said carrier-frames and horizontally-ar-
ranged gear-wheels mounted upon the said
upper carrier-frames, and adapted to engage
5 the said rack, said gears provided on their
upper sides with clutch-faces, a clutch mem-
ber secured to the upper end of each of the
said carriers, picker-fingers journaled in the
said carriers, means for rotating the said fin-
10 gers, and means for moving the said carriers

vertically to disengage the clutch members
thereof from the clutch members of the upper
carrier-frames.

In testimony whereof I affix my signature in
the presence of two witnesses.

JAMES K. PIPER.

Witnesses:

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E. W. ARTHUR.