

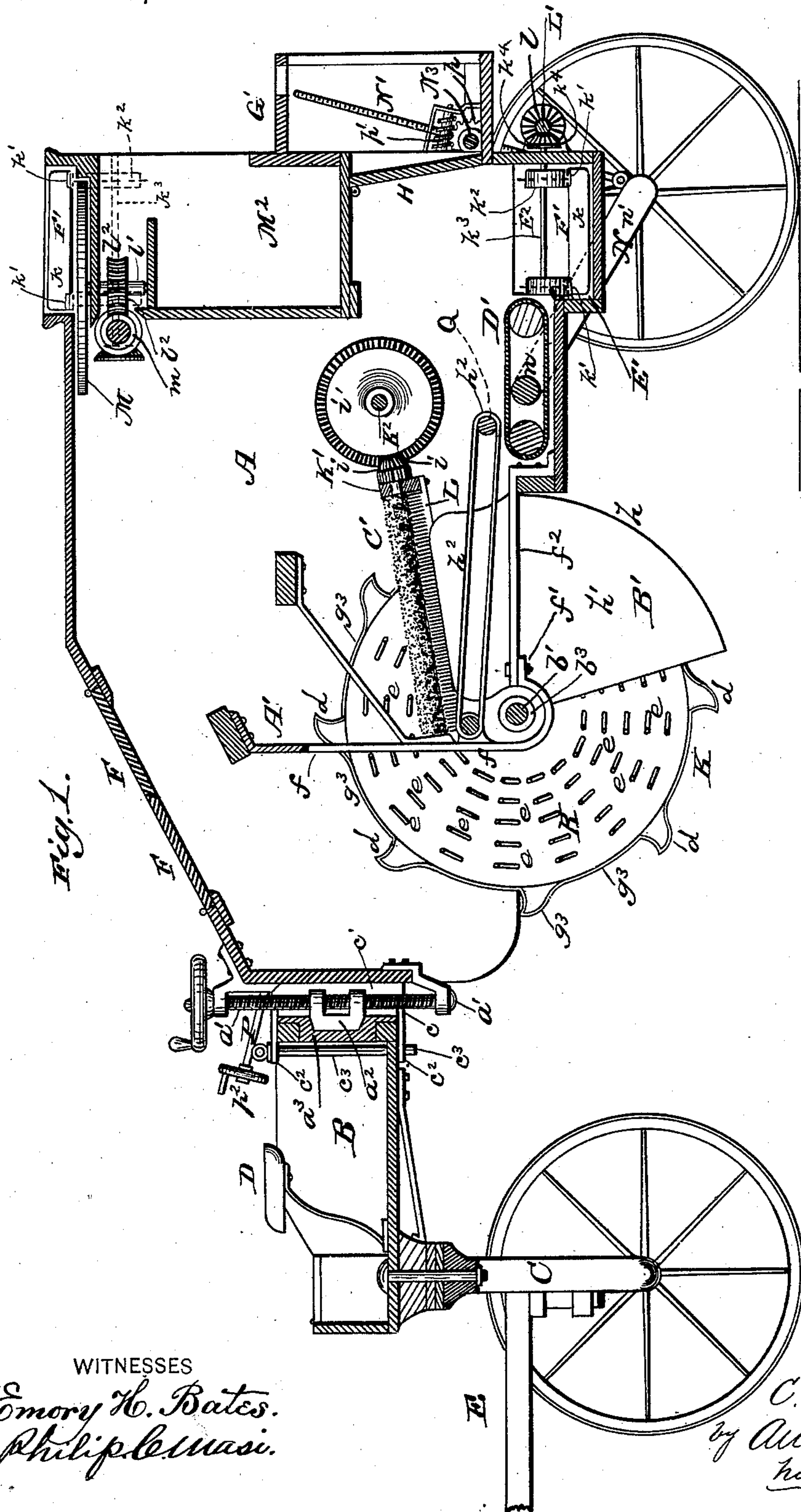
(No Model.)

8 Sheets—Sheet 1.

C. C. PRICE, Jr.
COTTON PICKING MACHINE.

No. 279,799.

Patented June 19, 1883.



WITNESSES

Emory H. Bates.
Philip C. Masi.

INVENTOR

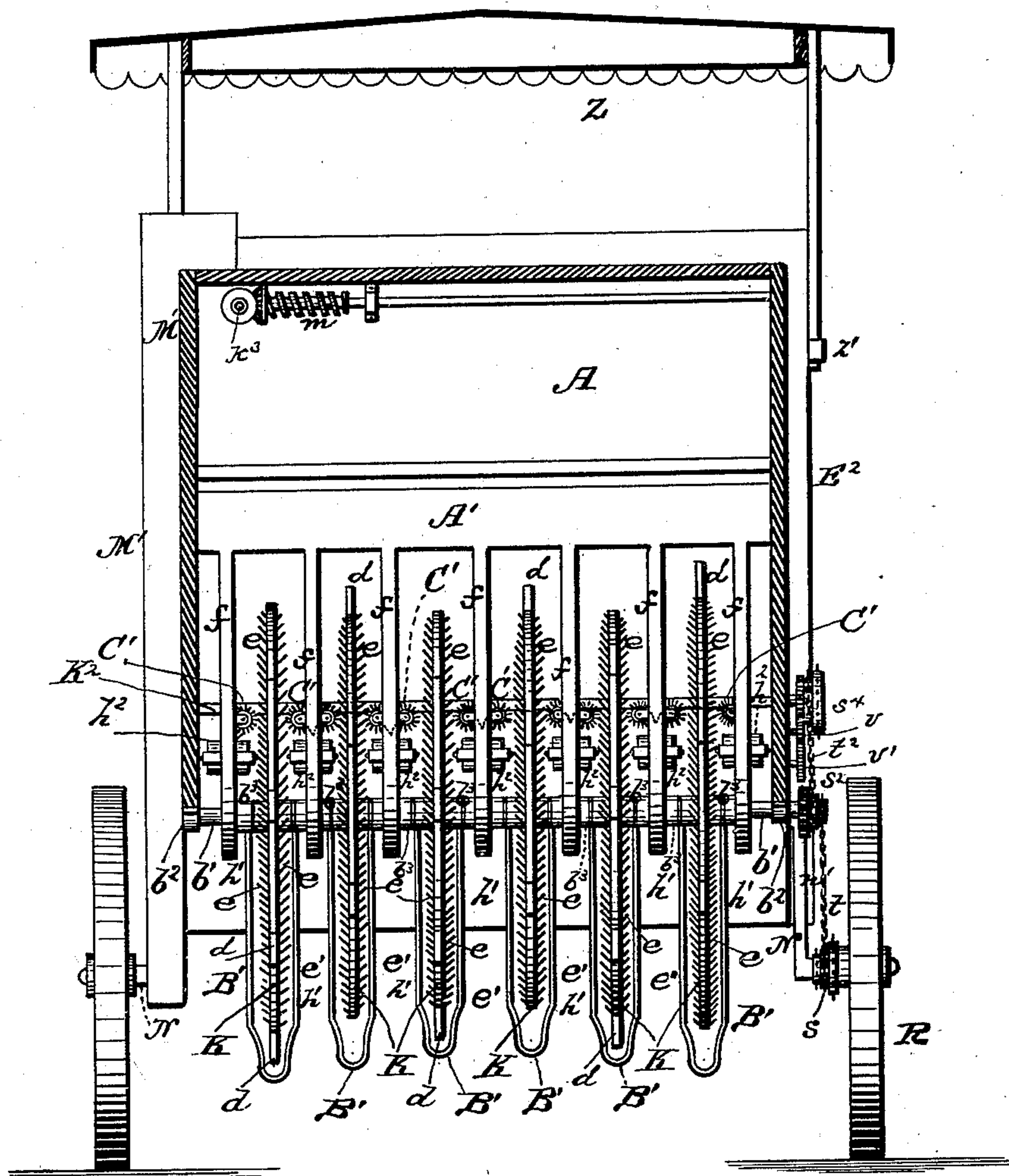
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8 Sheets—Sheet 2.

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Fig. 2.



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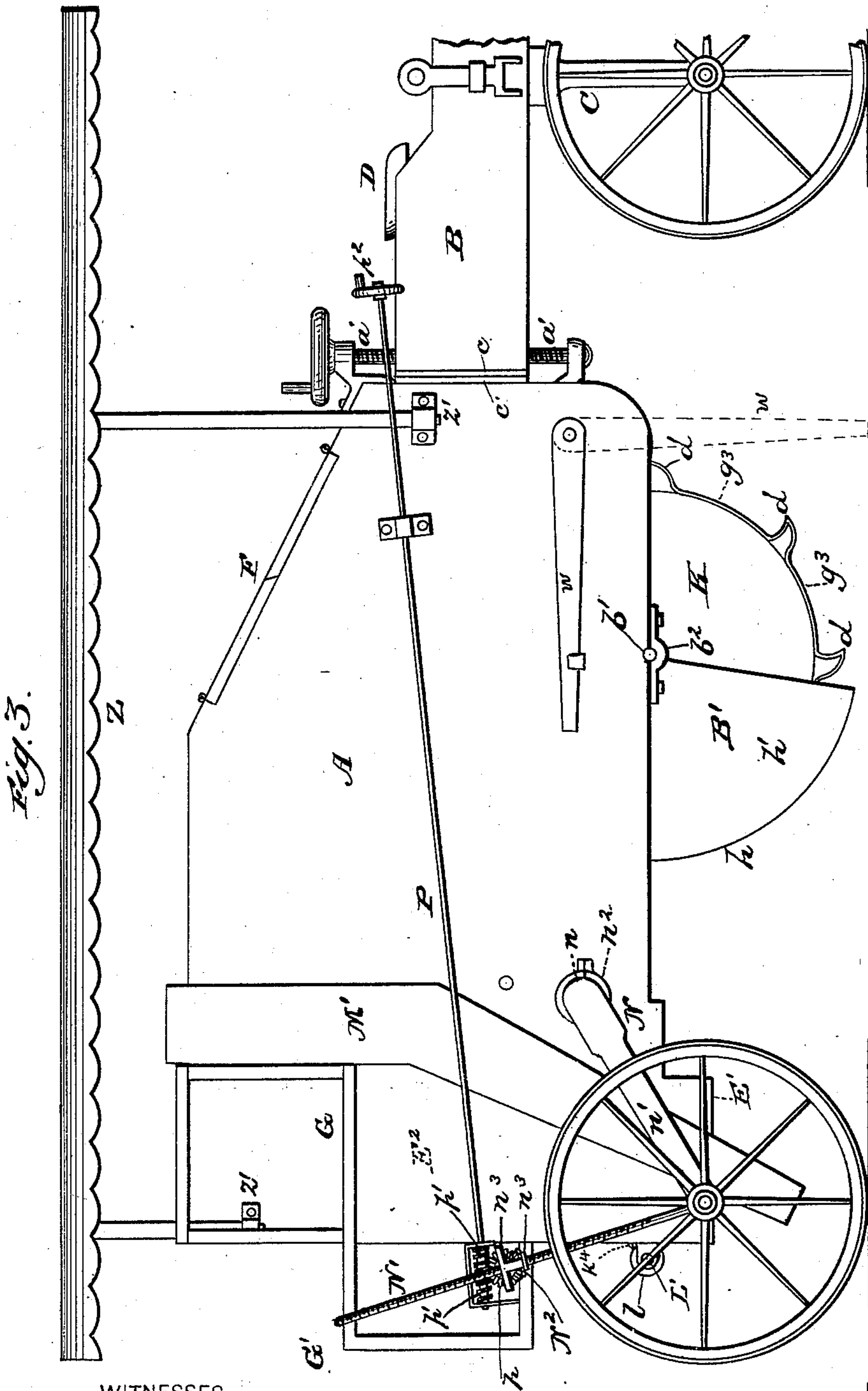
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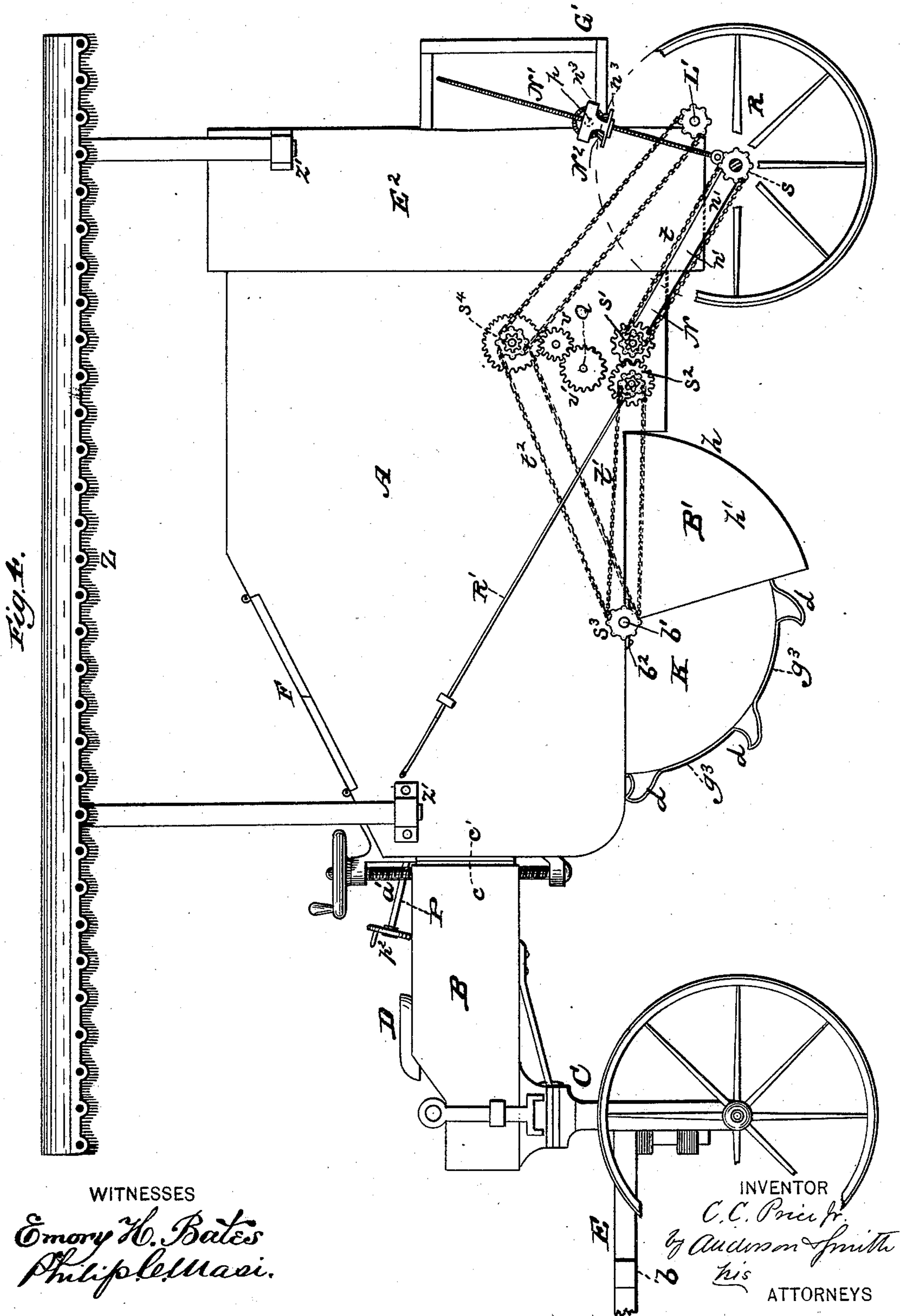
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(No Model.)

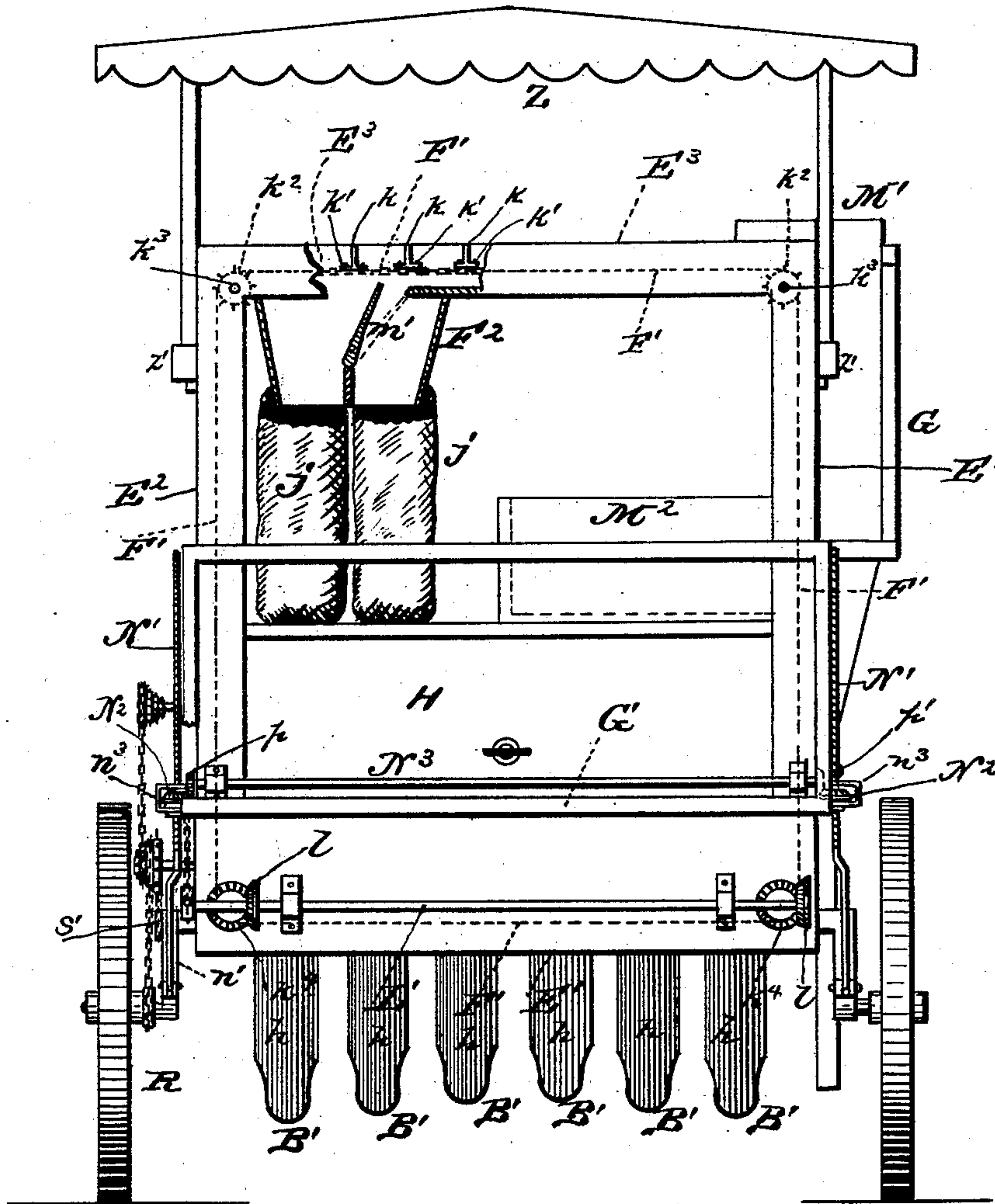
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Fig. 5.



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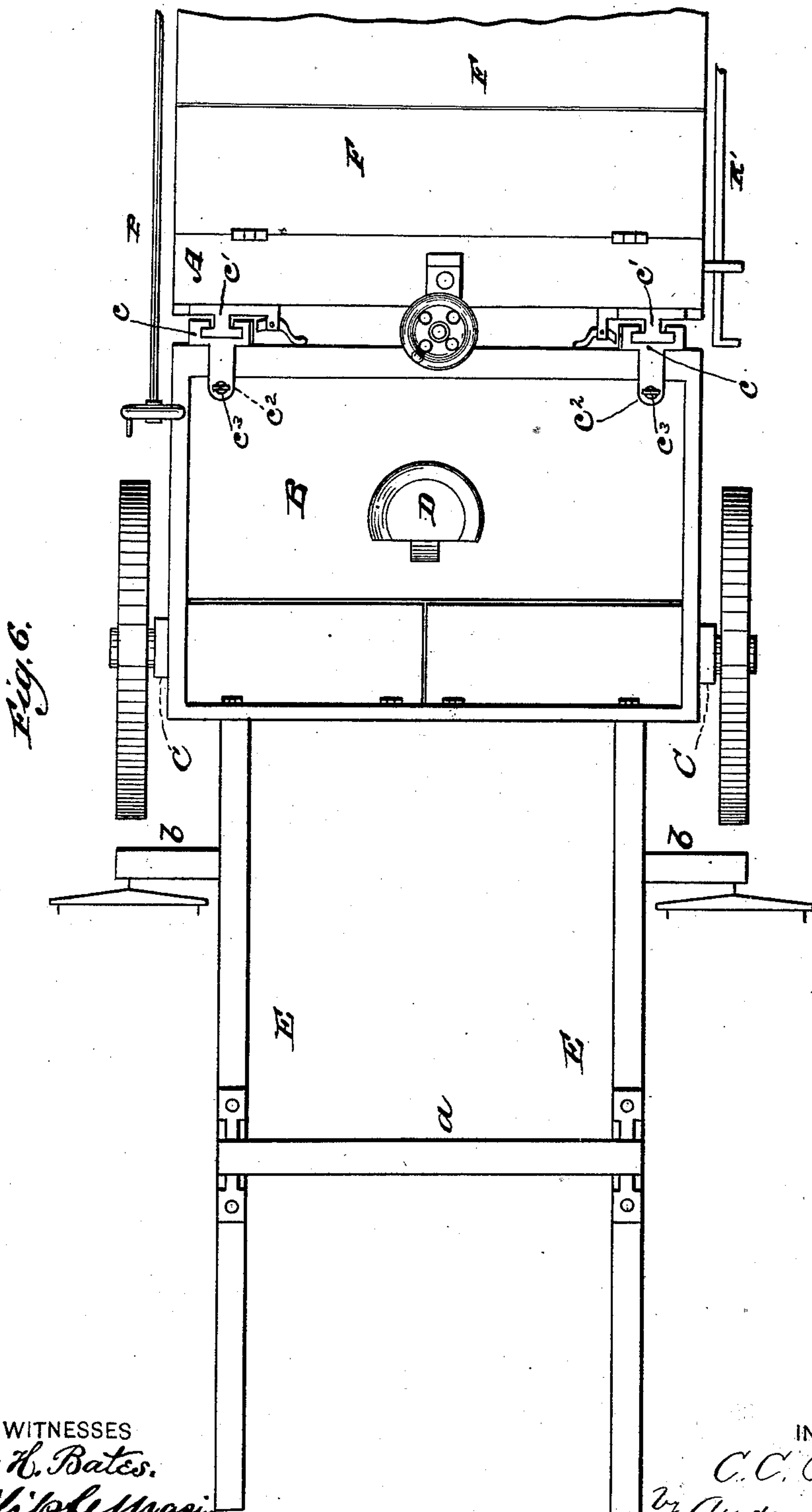
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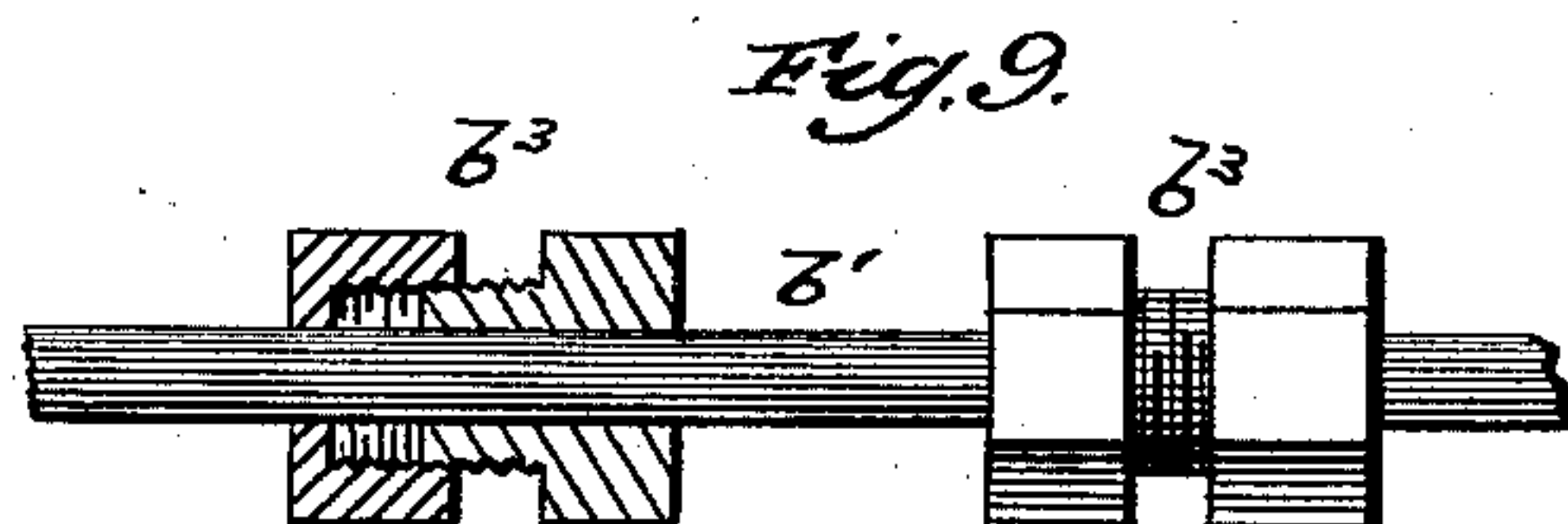
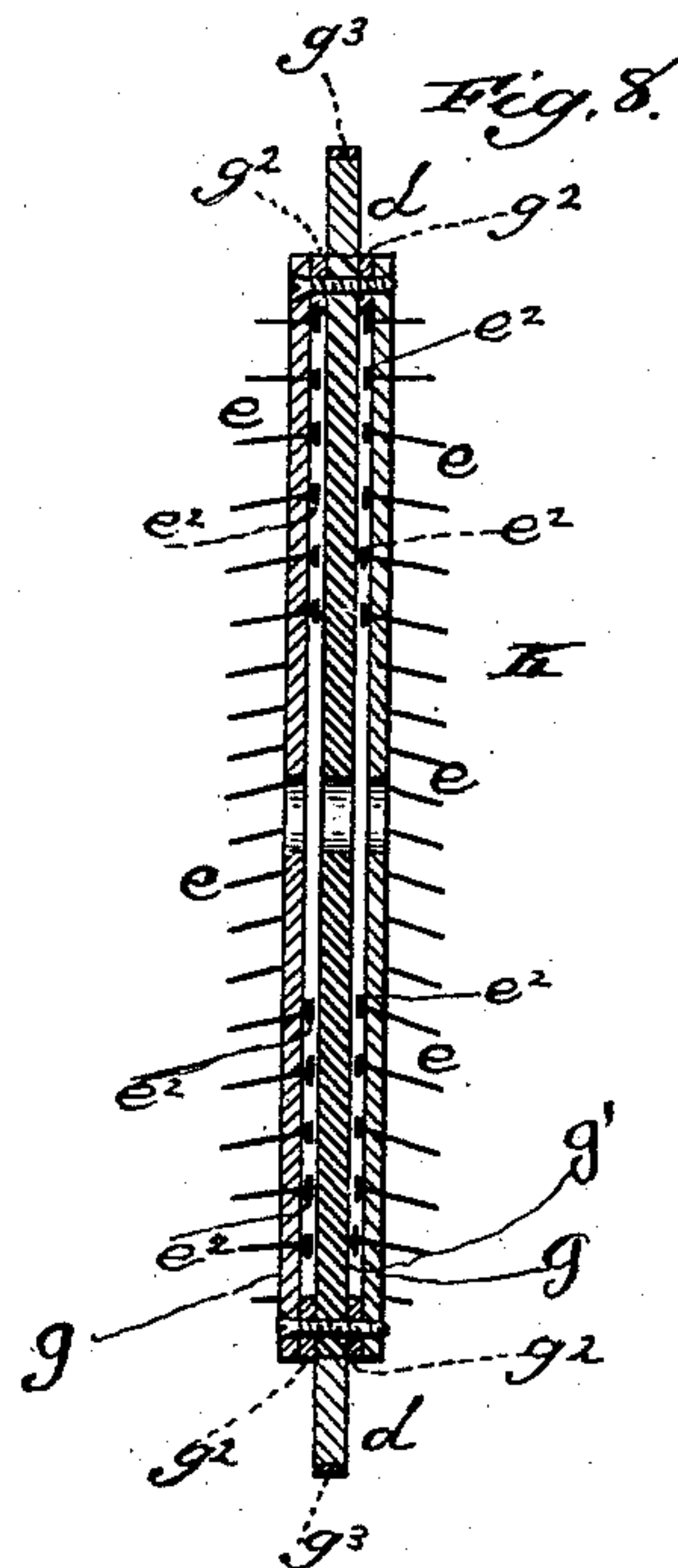
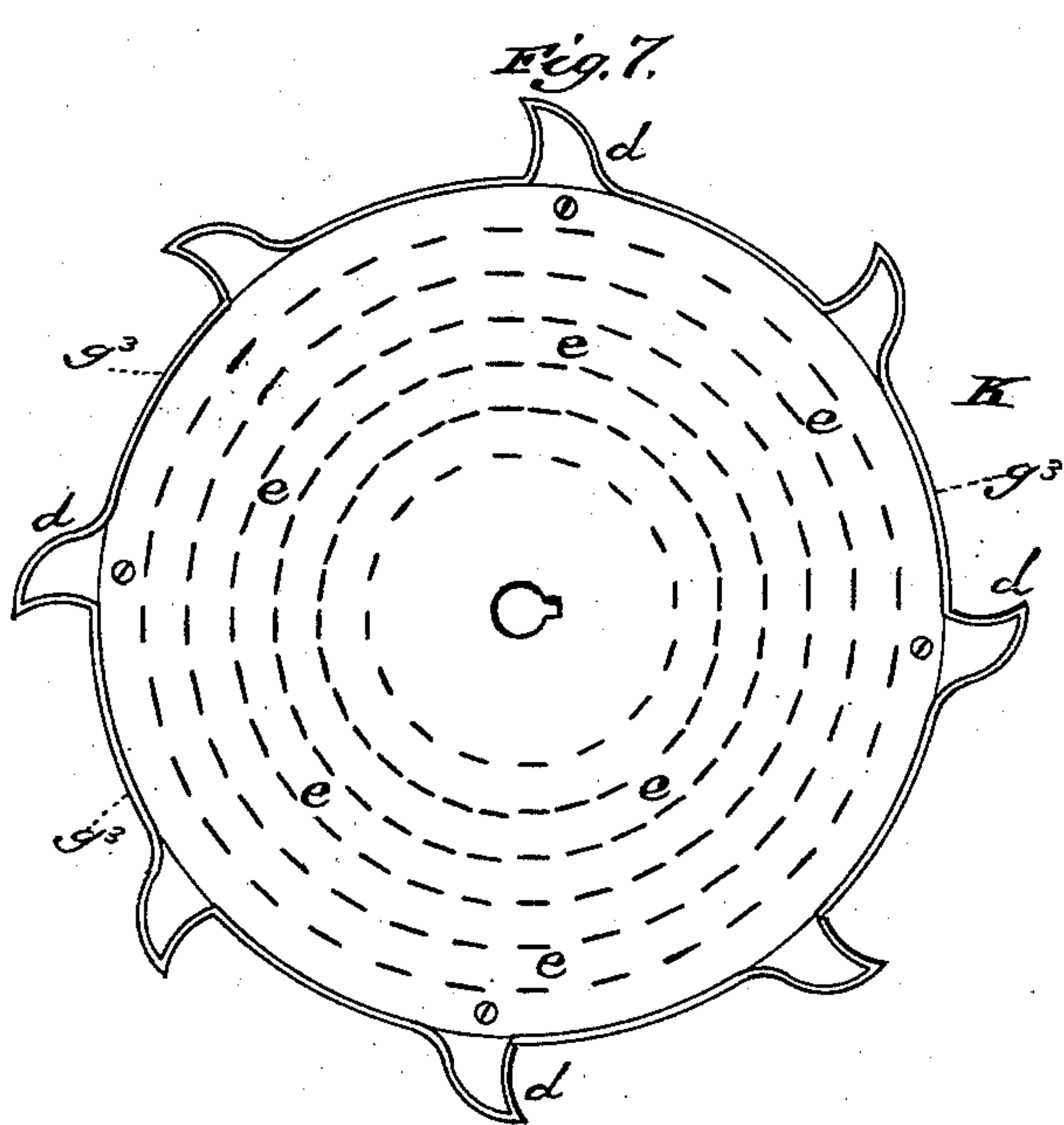
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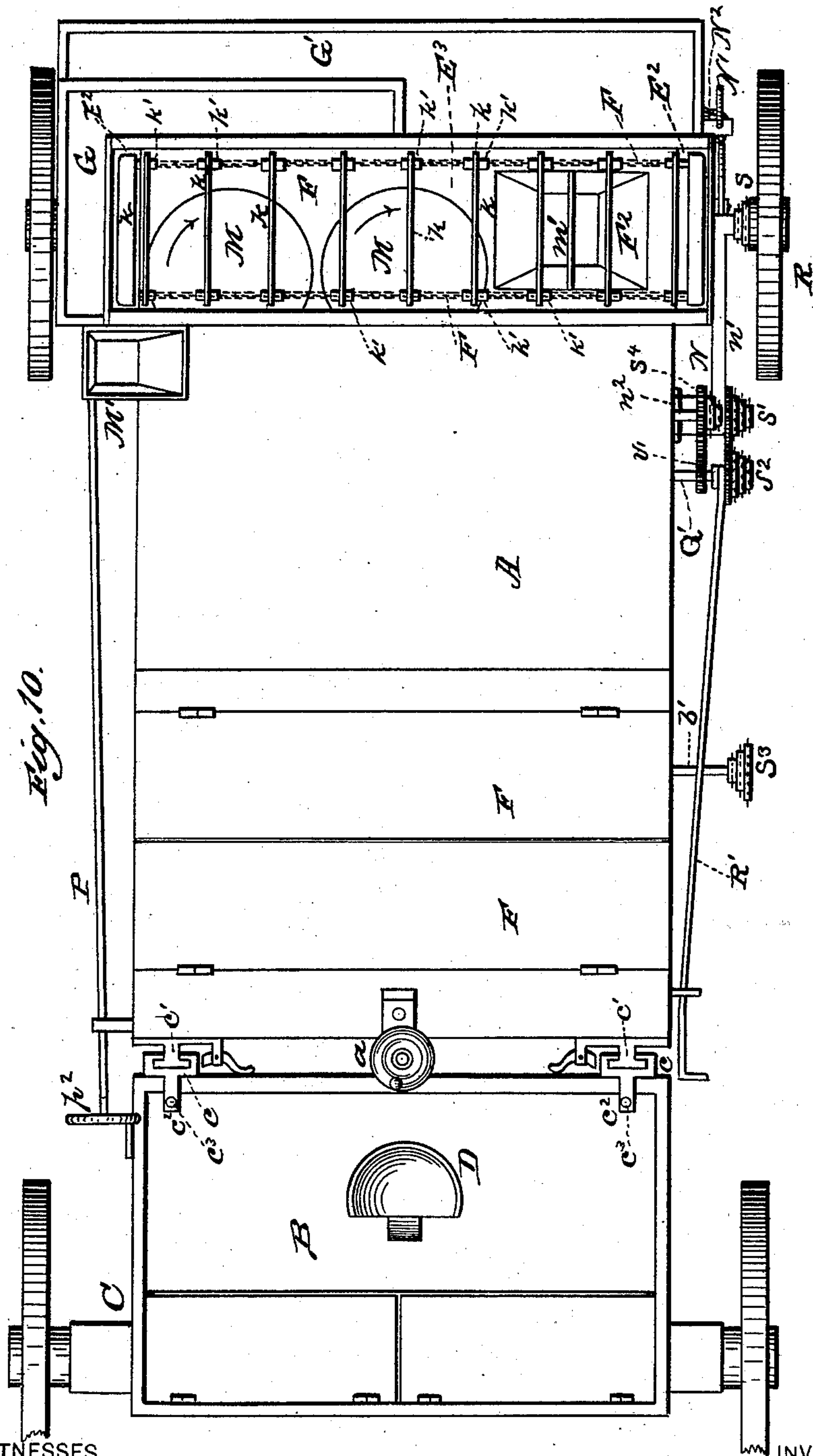
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UNITED STATES PATENT OFFICE.

CHARLES C. PRICE, JR., OF ELIZABETH CITY, NORTH CAROLINA.

COTTON-PICKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 279,799, dated June 19, 1883.

Application filed July 11, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. PRICE, JR., a citizen of the United States, and a resident of Elizabeth City, in the county of Pasquotank and State of North Carolina, have invented a new and valuable Improvement in Cotton-Picking Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a vertical sectional view of my cotton-picker. Fig. 2 is a vertical cross-sectional view of the same. Fig. 3 is a side view; and Fig. 4 is also a side view, opposite side to Fig. 3. Fig. 5 is a rear view of the machine. Fig. 6 is a top or plan view of the front portion of the machine. Fig. 7 is a side view of one of the picking-disks. Fig. 8 is a vertical sectional view of the same. Fig. 9 is a detail view of part of the shaft on which the disks are secured, showing the adjusting devices; and Fig. 10 is a top view.

This invention has relation to machines for picking cotton; and it consists, mainly, in providing a transverse series of rotating picking-disks having peripheral lifting-teeth and lateral inclined prongs or teeth studding the sides thereof; in the shields covering the lower rear portions of the toothed picking disks or wheels; in the pairs of forwardly-extended brushes between the picking-disks, geared together and operated by miter-wheels on a transverse shaft; in the combination, with laterally-toothed picking-wheels and their shields and brushes, of the combing devices extending between the picking-wheels and engaging the brushes; in the combination, with the laterally-toothed picking-wheels, and their shields, brushes, and brush-clearing combs, of the small intervening endless bands between the picking-wheels, the broad endless band on which they discharge, and the endless elevator, working in a low trough and carrying the material deposited therein upward to the upper portion of the machine; in the combination, with the picking-wheels, and their shields, brushes, combing devices, and the endless carrying-bands and elevator, of the elevator-trough below the lateral elevator-passages, and the elevator-way above,

having the discharging-chute extending downward therefrom; in the construction and novel arrangement of the endless elevator-chain and its lifting boards or buckets; in the picking-wheel constructed of two outer studded disks and an inner disk or backing peripherally toothed and metal-bound, said disks being separably connected; and it further consists in features of novel construction and arrangement, as will be hereinafter fully described, and pointed out in the claims appended.

In the accompanying drawings, the letter A designates the rear part or body of this machine, and B the front part, which is detachable therefrom in the preferred construction. The front part, B, is supported by an arched front axle, C, suitable springs being usually provided above said axle to ease the movement of the machine. The front part is made in box form to serve as a receptacle for the sacks, and is provided with a chest or compartment in which the tools required for use upon the machine may be carried.

D represents the driver's seat, which is secured to the front section of the machine, and the operating-handles used in connection with the adjustable-parts of the mechanism may be assembled about it in such position as to be within easy reach of the driver.

E represents the double pole, the branches of which are connected by the transverse bar *a*, which is constructed in arched form to clear the tops of the cotton-bushes as the machine advances. Each branch of the double pole is provided with a lateral draft-arm, *b*, to which the horse is connected on the outside of the branch, a single-tree being usually provided, as indicated in the drawings. When the machine is constructed in two parts, as hereinbefore described, the heavy rear portion or body, A, can, at the close of the day's work, be left standing in the field, while the front part serves as a means of transportation for the driver and other operatives to their quarters. It will be observed that the arrangement of the draft is such that the horses are respectively in line with the front and rear wheels of each side of the machine. The horses are therefore well on the outside, and can in no way interfere with the cotton-rows being operated upon by the machine; but they are liable to come in contact with branches of plants

in the adjacent rows, and in order to protect them and avoid knocking the cotton off said rows it is advisable to provide shields, which extend horizontally around the lower portions of the horses. These shields may be each made in two parts or sections, whereof the inner part is designed to be secured to a branch of the double pole, and the outer part hinged to the inner part, so that it may be opened to admit the horse. These shields are designed to be curved outward at their lower edges in order to lift the lower portions of the cotton-bushes somewhat as the machine advances.

The rear section or body, A, of this machine is connected to the front section in such a manner that it shall be capable of a rising-and-falling movement. This may be accomplished by the employment of the vertical slide connections c c' , whereof the front slide is secured to the front section by means of perforated lugs c^2 and a pivot key-bolt, c^3 , or so that it can readily be detached from the front section, B. The rear slide is permanently bolted or screwed to the rear section, and a spring-pawl should be provided, which, when the front part, B, of the machine is detached, will engage a rack on the inside of the front slide and prevent it from falling. When the sections A and B are connected this pawl is relieved from the rack by means of a vertically-extended bearing on the rear end of the front section. Between the reciprocating connections, which are arranged near the sides of the machine, is located the vertical screw a' , the ends of which are seated in pivot-bearings secured to the rear section, A. This screw carries an internally-threaded rearwardly-projecting piece, a^2 , which, when the sections A and B are brought together, is designed to engage a recessed bearing-plate, a^3 , secured to the front section. By means of these devices the front part of the rear section of the machine can be depressed or elevated, according to the requirement of the work.

The rear section or body, A, of the machine is formed with a box-like inclosing-frame, which is open at its lower front part to expose the operating portions of the picking-disks. Doors F are arranged to close an upper front opening, which is provided to enable the driver or other operatives to easily get at the picking and brushing mechanism in the interior of the incasement when necessary. In rear the frame is provided with platforms or stands G and G' to support the trashers and baggers, and doors H and slides H' are provided in the wall of the case to enable the operatives to obtain access to the interior whenever it may be necessary.

K K indicate the vertical forwardly and upwardly revolving picking-disks, which are arranged in transverse series on a shaft, b' , which extends from side to side of the machine, its journals being seated in boxes b^2 at or near the lower edges of the side walls of the rear section, A, as indicated in the drawings. The disks K are keyed or otherwise secured

to the shaft b' , and are kept at the proper distance from each other at their centers by means of intermediate threaded or adjustable bearings, b^3 , on the shaft. Each disk K is provided with peripheral forwardly-bent teeth d , of large size, which are designed to enter the cotton-bushes below, and, moving forward and upward, to comb or raise the branches and twigs of the bushes upward, bringing them in suitable position to be subjected to the action of the inclined picking-teeth e , with which the sides of the disks are studded. In order to prevent the action of the peripheral teeth from being too abrupt near the main stalk of the plant, where the main branches are liable to be broken rather than bent, the middle disks are made smaller in diameter than the outer disks. Usually it is preferable to graduate the disks in size from the middle ones to those which are arranged on the outer side. An even number of disks should be employed, in order that one of the intermediate spaces, e' , shall be central and serve to ease the action of the machine with reference to the central portion or main stalk of the plant. It will be observed that the interspaces e' between the disks are bounded by the pin-studded sides of the disks, so that when the branches and twigs of the plants are lifted upward by the peripheral teeth of the disks the lateral inclined teeth of said disks will pass upward and forward over and through said branches and twigs, taking out the cotton from the opened bolls, the cotton being drawn upon the blunt-pointed pins e , so that the latter project through, ready to act upon other bolls as the machine advances. The teeth e are designed to be placed somewhat closely together, being arranged at about a half an inch from each other, so that the unopened bolls and larger branches will not pass in between them, but will pass through the interspaces e' out of the machine.

The disk K is usually constructed of three parts—two outer disks, g , and an inner disk or backing, g' , of somewhat greater thickness, which carries the peripheral teeth d . In the outer disks, g , are seated the lateral inclined teeth e , these being formed with inclined heads e^2 , in order that these heads may have a good bearing on the backing-disk g' . The teeth e are arranged in concentric circles, and are inclined forward at an angle of about sixty degrees to the face of each disk, as indicated in the drawings. The circular series of perforations through the outer disks, g , in which these lateral or face teeth e are seated, are also bored at the angle stated, in order to assist in holding the teeth at the proper inclination. It should be observed that the angular position of these teeth e may be varied somewhat without departing from the principle of the invention. The disks g and g' may be made of metal or wood, the latter being preferred on account of its comparative lightness. In order to secure the proper amount of strength in the three disks and to prevent warping, each disk should be made of two or more

thinner disks, which are secured together, with the grain of the wood crossing, by strong glue, and, if necessary, small screws. The outer disks, g , as well as the inner or body disk, g' , are designed to be constructed in layers, as stated, and when the teeth e are seated in said outer disks the three disks are secured together by suitable screws. In the spaces between the disks, caused by the interposition of the heads of the teeth e intermediate bearings are arranged, and especially annular bearings g'' between the margins of the disks, which serve to strengthen these margins, and at the same time to keep out dust and extraneous matter from the interior of the picking-wheel. Around the margin of the inner disk, including its peripheral teeth, when made of wood, extends an arming or tire, g'' , of wrought-iron, which materially strengthens the wheel and its lifting-teeth and prevents too rapid wear.

Between the picking-wheels K extend downward the arms or fingers f of a transverse partition, A' , to the shaft b' , and the lower ends of said arms or fingers pass around said shaft and form bearings f' , which engage the forward ends of the horizontal arms or fingers f'' , which extend forward between the picking-wheels from the connected series of shields B' , transversely arranged in rear of the lower portions of said picking-wheels. These shields are sector-shaped, and are designed to inclose the rear lower portions of the picking-wheels, to prevent action on the plants by said portions, which have a general downward movement, and to facilitate the passage of the branches, twigs, and unopened bolls, which are by said shields disengaged from the lateral teeth of the picking-disks and afforded free passage to the rear as the machine advances. It will be observed that in this construction each shield or guard forms an inclosure about the rear lower portion of each picking-wheel, and is made with a curved rear wall, h , lateral walls h' , and an intermediate horizontal connection, f'' , whereby it is joined to the next shield or guard in the transverse series. Preferably the entire series of shields is rigidly connected, forming one piece, which can readily be adjusted in position or removed when necessary. The ends of the shield-rack thus formed should be securely bolted to the side portions of the incasement. The lateral walls h' of these guards or shields B' extend upward somewhat above the horizontal partition-fingers f'' , forming above the same the channels or troughs in which run from front to rear the small endless belts h'' , which serve to carry the cotton, which is dropped from the rotating brushes C' above, back to the rear end of the guard-rack, where they deliver it to the broad endless carrying-band D' , which extends from side to side of the machine, and, running to the rear, discharges the cotton into the trough of the endless elevator F' . The brushes C' are of small diameter, being made in the form of rotating fingers, which

extend from a transverse bearing-bar, K' , in rear of the picking-wheels and above the shields B' , forward between said picking-wheels. Two of these rotating brushes are located in each interspace e' , and are laterally arranged so that each brush will clean the teeth on the side of the picking-wheel next to which it is seated. The outer portion of each brush which engages the teeth e is rotated downward in order to take the cotton easily from said teeth, whose inclination is downward when they arrive in position to be swept by the brush. The front ends of the brushes are journaled in bearings attached to the fingers f of the transverse partition A' , and their rear ends to the bearing-bar K' , these ends being geared together in pairs by small beveled pinions i , which are operated by the bevel-wheels i' , secured to the transverse horizontal shaft K'' . Engaging the inner sides of the brushes C' is a comb or combs, L , the teeth of which extend into the inner sides of each pair of brushes, and, as the latter revolve, serve to clear off the cotton therefrom, which falls on the small carrying-belts h'' below, thence to be conveyed by the broad band D' back to the elevator-trough in the lower rear portion of the case.

From the ends of the transverse elevator-trough E' inclosed passages E'' extend upward in the sides of the case to the ends of the upper horizontal elevator-way, E''' , which extends across the top of the rear portion of the case, being open in such a manner as to expose the horizontal upper portion of the elevator with the material brought up from the trough below, so that the operatives on the rear of the machine can readily take out the trash, allowing the cotton to pass on and fall through the discharging-chute F'' into the bag, which is attached at the lower end of said chute to receive it, as indicated at j .

The elevator F' consists of two parallel endless chains, which are transversely connected by the lifters or bucket-boards k , which are attached to said chains in such a manner as to preserve their position at right angles to the direction of the chains. This may be accomplished by providing the buckets with transverse irons or arms k' , which are connected to the links in advance and in rear and serve to hold the buckets in proper position. The endless chains move on the sprocket-wheels k'' , which are provided on the short horizontal shafts k''' , which are seated in bearings at the upper and lower ends of the vertical passages E'' . The lower shafts, k''' , are provided with bevel-pinions k'' to engage the bevel-wheels l of the transverse shaft L' , by means of which they are turned and the chain-belt is operated.

Extending into the upper elevator-way, E''' , in such a manner that their upper surfaces shall be flush with its bottom, are the rear portions of horizontal circular moving disks or spreaders M , which are provided with vertical pivot-stems l' , seated in bearings in the frame, and having on their lower portions toothed wheels l'' , designed to engage a worm, m , or

other gearing arranged to move the rear portions of these horizontal disks forward or toward the discharging-chute F^2 somewhat more rapidly than the elevator-chain is traveling through the way E^3 in the same direction. The object of this construction is to disintegrate the masses of cotton and the trash which are brought up by the elevator-chain and to spread the same, so that the trashers can readily pick out the trash while the cotton is carried forward. At the same time the cleanest portions of the cotton, falling between the lifting-boards of the elevator-chain, are carried forward out of the way of the trashers by the horizontal disks. M' indicates a laterally-arranged trash-chute, which extends downward from the top of the machine and serves to guide the trash which is thrown therein from above downward, discharging it in rear of the machine, or so that it will not fall on the adjacent rows of plants.

The trashers' platform or platforms G is arranged at a higher level in this machine than the platform G' for the bagger, and the former platform may be adjustable in order that it may be arranged to suit the height of the operators, who will frequently be, for this work, of small size. These platforms can readily be provided with seats, if desired.

Under the elevator-way, on one side of the rear portion of the machine, is a recess, M^2 , in which are stowed the empty bags in convenient position to be reached by the bagger on the left. A similar recess on the other side, under the elevator-way, serves to receive the bags which are to be filled, the same being attached to the lower end of the discharging-chute F^2 , which projects downward into this recess, as indicated in the drawings.

In the chute F^2 is located a vibratory board or valve, m' , which may be turned toward one side or the other of the chute in such a manner as to close either side of it and at the same time open the other, so that the stream of cotton descending will be directed first by the opening on one side of the valve into one of the two bags fastened to the chute below until this bag is filled, and then, the valve being turned, by the opening on the other side into another bag, the first bag being then removed forward to the driver's box and another substituted in place thereof under the chute. In order to pack the loose cotton falling in the bags, rear openings are made in the chute F^2 , through which the bagger, provided with a suitable packing-rod, can work.

N represents the arched adjustable rear axle, on which the rear part of the machine is principally supported. The transverse portion n of this axle is seated in bearings n^2 , which may be provided with springs incased in the boxes and serving to ease the movements of the machine over rough roads. From the ends of the transverse portion n extend downward in a vertical or inclined position, according to the adjustment, the crank-arms n' , to the ends of which are secured the spindles carrying the

hind wheels. The axle N is therefore adjustable about the transverse portion n as a center, the crank-arms n' being raised or depressed by suitable mechanism in order to depress or raise the rear portion of the body A of the machine. In order to operate this axle conveniently from the driver's box, the rear ends of the crank-arms n' are provided with threaded rods N' , the lower ends of which are strongly pivoted to the lower ends of the arms n' , and serve not only to adjust said arms, but also to brace the same in position. The rods N' extend upward obliquely through nuts N^2 and through bearings above and below said nuts, as indicated at n^3 , which are respectively pivoted on the ends of a transverse shaft, N^3 , having bevel-pinions p , which engage the bevel-teeth of the nuts N^2 . Also engaging the teeth of one of the nuts N^2 is a worm, p' , on the rear end of the operating-shaft P , which extends forward in suitable bearings, and is provided with a hand-wheel, p^2 , whereby it can be readily turned by the driver when necessary. By turning the rod P the rods N' are caused to move upward through the toothed nuts N^2 to raise the crank-arms n' , and thereby to depress the body of the machine in rear. By reversing the movement of the shaft P the crank-arms are depressed and the rear portion of the body of the machine is raised. By means of the front and rear adjusting devices the rear section or body of the machine can be arranged in level position at any height desired. In traveling over roads or to and from the field of work the machine is adjusted in the raised position. While at work in the field it is depressed to suit the work.

The mechanism is designed to receive its motion from one of the rear supporting-wheels R , to the hub portion of which is secured a sprocket-wheel, s , engaging a chain-belt, t , which extends over and engages a cogged sprocket-wheel, s' , secured to a projecting end of the transverse pivoted portion n of the rear axle. The sprocket-wheel s' engages by its cogs a cogged sprocket-wheel, s^2 , which is graduated, being provided with several bearing-surfaces of different diameters, carrying teeth to engage the adjustable chain belt t' , which extends forward and engages a similar graduated sprocket-wheel, s^3 , on the shaft which carries the picking-disks. Means are thus provided whereby the speed of the picking-disks can be regulated to suit the work. A graduated sprocket-wheel, s^4 , is secured to the end of the shaft K^2 , which carries the large miter-wheels i' , and this sprocket-wheel is connected to the sprocket-wheel s^3 by the chain belt t^2 . In this manner devices are provided for changing the speed of the brushes. In some constructions it may not be necessary to employ adjustable gearing, it being, however, directed that the speed of the picking and lifting wheels shall be slow and that of the clearing-brushes rapid.

The sprocket-wheel s^4 is peripherally cogged to engage an intermediate toothed wheel, v ,

which engages the gear-wheel v' on the end of the shaft Q , which drives the small endless carrying-belts h^2 . The band D' may be driven by a gear-wheel, S^2 , on the end of the driving-shaft Q' .

Motion may be communicated to the transverse shaft L' , which operates the lower shafts of the elevator chain belt by means of a belt extending from the wheel s^4 on the end of the miter-wheel shaft K^2 ; and in order to turn the horizontal spreaders in the upper elevator-way, it is designed to place a bevel-wheel on the projecting end of one of the upper elevator-shafts, which is in juxtaposition to the end of the worm which engages the pinions on the stems of said spreaders.

The sprocket-wheel s^2 may have lateral motion on its bearing, or may be made separable from a cogged section, a clutch-sleeve being provided, so that by means of a long lever, R' , extending forward within reach of the driver, a disconnection may be effected at any moment, whereby the operation of the lifting, picking, clearing, and carrying devices will be stopped.

Instead of the gearing herein described, other arrangements of driving-gear may be adopted, which will serve to move the mechanism properly. I do not therefore confine this invention to the construction illustrated, as it may be varied in many ways by those skilled in the manufacture of agricultural machines.

The front section of the frame, when detachable, as hereinbefore described, should be provided with bolts or catches, which will serve to couple the box and the front axle and prevent the box from swinging around on the king-bolt when this part of the machine is detached; and in order to prevent the front part of the rear section from falling when the front section of the frame is taken away, the rear section is provided with adjustable or removable legs or props connected to it in front, as indicated at w , or in any other convenient manner.

It is important that a machine of this character should be provided with an awning, the frame Z of which may have its uprights seated in sockets z' , attached to the body of the machine.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. In a cotton-picking machine, a transverse series of forwardly and upwardly rotating picking-disks having peripheral lifting-teeth and laterally-projecting prongs or teeth studding the sides thereof, substantially as specified.

2. In a cotton-picking machine, the toothed picking-disks rotating in vertical planes, in combination with shields covering or inclosing the lower rear portions of said picking-disks, substantially as specified.

3. In a cotton-picking machine, the pairs of forwardly-extended brushes between the picking-disks, geared together and operated by

miter-wheels on a transverse shaft, substantially as specified.

4. In a cotton-picking machine, the combination, with laterally-toothed picking-wheels, and their shields, brushes, and brush-clearing combs, as described, of the small endless carrying-bands between the picking-wheels and under the brushes, substantially as specified.

5. In a cotton-picking machine, the combination, with picking, brushing, and clearing devices, as described, of endless rearwardly-carrying bands working between the pickers, a broad endless band receiving therefrom, and an endless elevator receiving from the broad band below and carrying upward to a discharging-chute, substantially as specified.

6. The combination, with the laterally-toothed picking-wheels, and their shields, brushes, and brush-clearing combs, of the small intervening endless bands between the picking-wheels, the broad endless band on which they deposit, and the endless elevator working in a low trough and conveying the material deposited thereon upward to the upper portion of the machine, substantially as specified.

7. In a cotton-picking machine, the rear transverse endless elevator-chain having the lifting boards or buckets, the elevator transverse troughs, passages, and the discharging or bagging chute, substantially as specified.

8. A picking-wheel having peripheral lifting-points and separable outer disks carrying laterally-projecting teeth, substantially as specified.

9. In a picking-wheel, the combination, with an inner disk or backing, of separable outer disks perforated at small intervals, and the bevel-headed teeth seated therein, substantially as specified.

10. In a cotton-picking machine, the combination, with a series of picker-wheels on a transverse shaft, and the forward partition having the partition-fingers extending downward into the spaces between the picking-wheels, of the gang or rack shield connected by its ends to the frame-work, substantially as specified.

11. In a cotton-picker, the combination, with an upper exposed elevator-way, of spreading devices flush with the floor thereof, moving in the direction of the discharging-chute, and means for operating the same, substantially as specified.

12. In a cotton-picker, a sectional detachable frame consisting of front and rear sections arranged, respectively, on the front and rear axles, and sliding connections between the same, allowing vertical adjustment to the rear or picking section, substantially as specified.

13. The combination, with a vertically-adjustable frame or case mounted on wheels carrying the picking devices, and mechanism for adjusting the same, of a detachable front section mounted on wheels carrying the front guides or slides for said frame or case, substantially as specified.

14. In a cotton-picker having an elevator and exposed elevator-way in rear, extending horizontally, a trasher's stand or platform and a trash-chute adjacent to said elevator-way, 5 substantially as specified.

15. In a cotton-picker, the bagger's stand or platform in rear of the machine, the bagging-recess under the upper horizontal elevator-way, the bagging-chute projecting downward into said recess, and the vibratory cut-off or valve in the bagging-chute, substantially as specified. 10

16. A picking disk or wheel consisting of the outer disks carrying the laterally-projecting picking-teeth, and the inner disk or backing having the peripheral lifting-teeth, and the metallic rim or binding-tire including said lifting-teeth, substantially as specified. 15

17. A cotton picking and bagging machine 20 having between the picking devices and the

bagging-chute an exposed horizontal way for the passage of the upper horizontal portion of the elevator, whereby the separation of the trash from the cotton is facilitated, substantially as specified. 25

18. In a cotton-picking machine, the combination of a series of advancing and upwardly-moving lifters with a series of forwardly and upwardly moving lateral picking-teeth arranged to form a series of intervening spaces, and guards or shields on each side of said intervening spaces, substantially as specified. 30

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

CHAS. C. PRICE, JR.

Witnesses:

J. F. RUSSELL,

D. C. LIPPINCOTT.