

(No Model.)

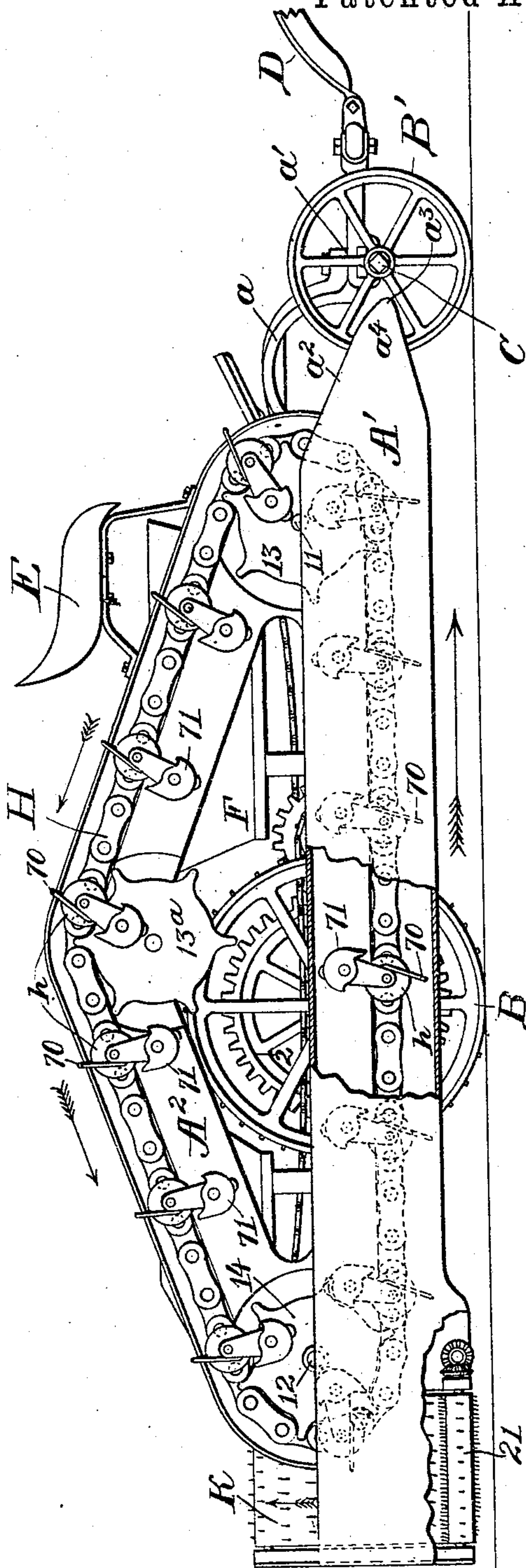
5 Sheets—Sheet 1.

B. GAUSE.
COTTON HARVESTER.

No. 503,041.

Patented Aug. 8, 1893.

Fig. 1.



Witnesses

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(No Model.)

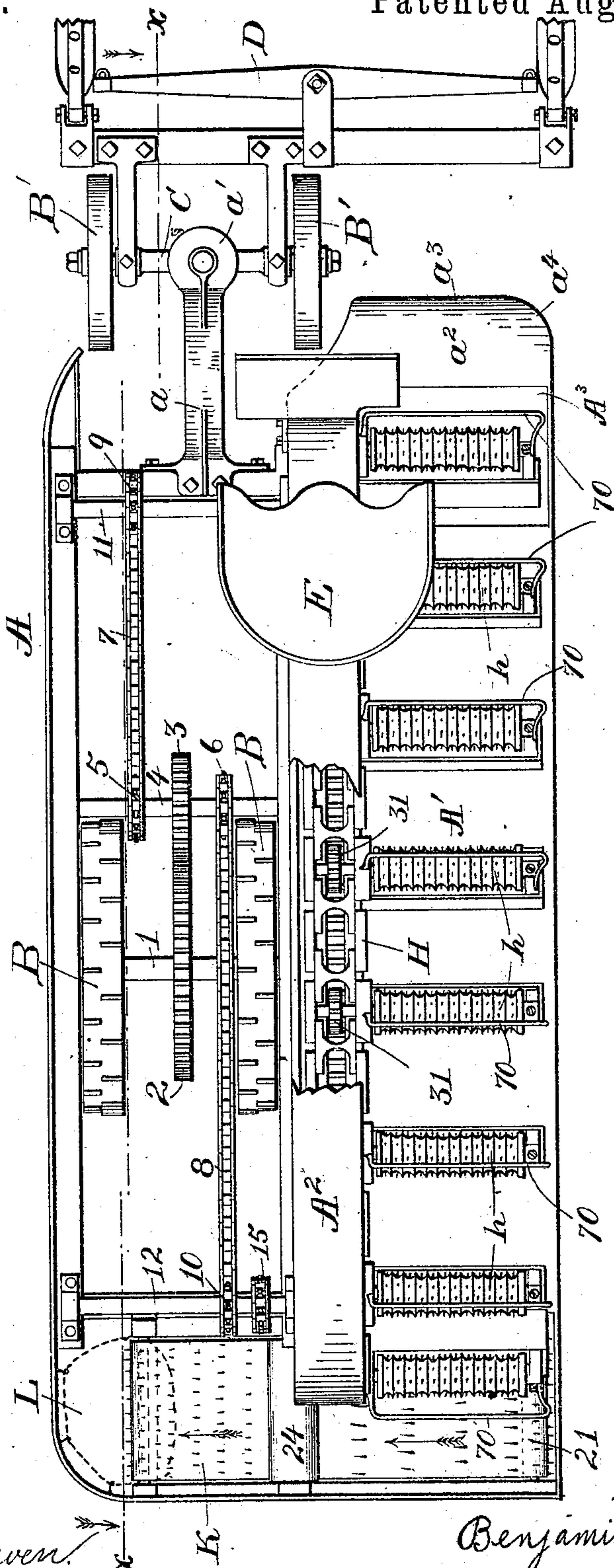
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Fig. 2.



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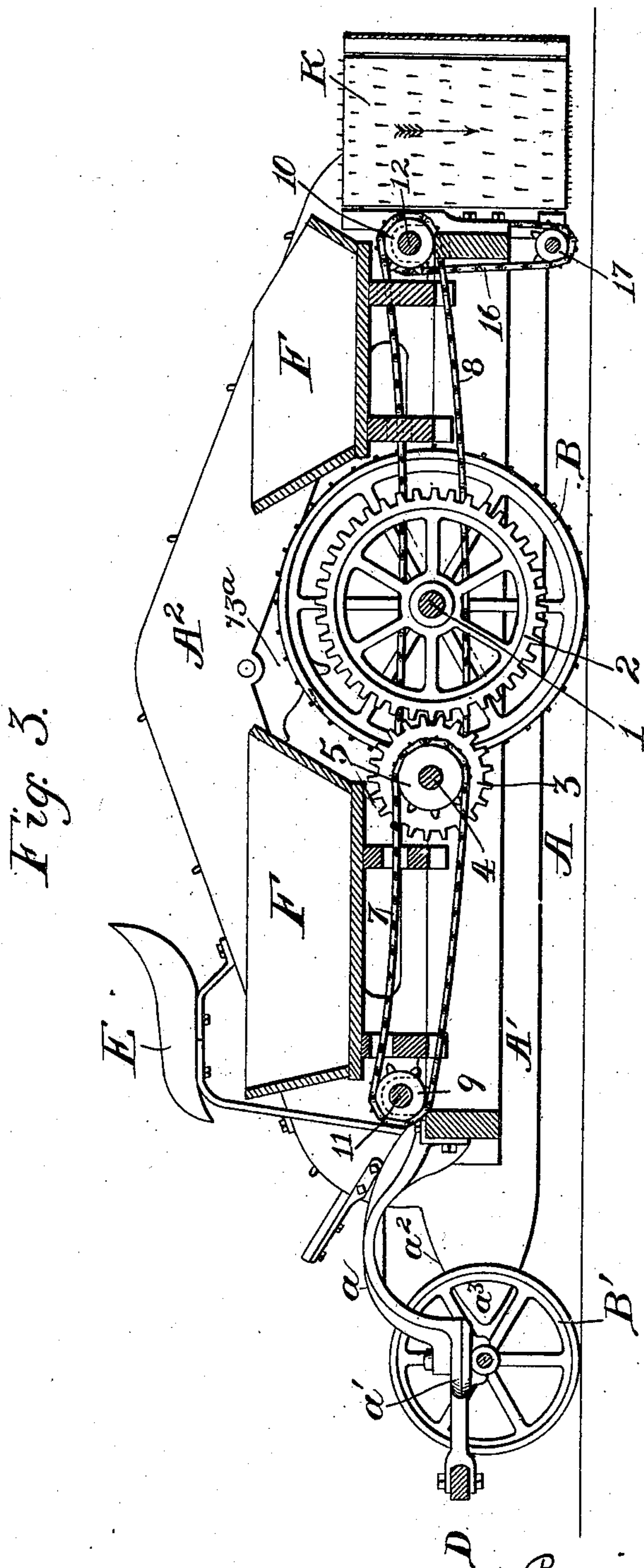


Fig. 3.

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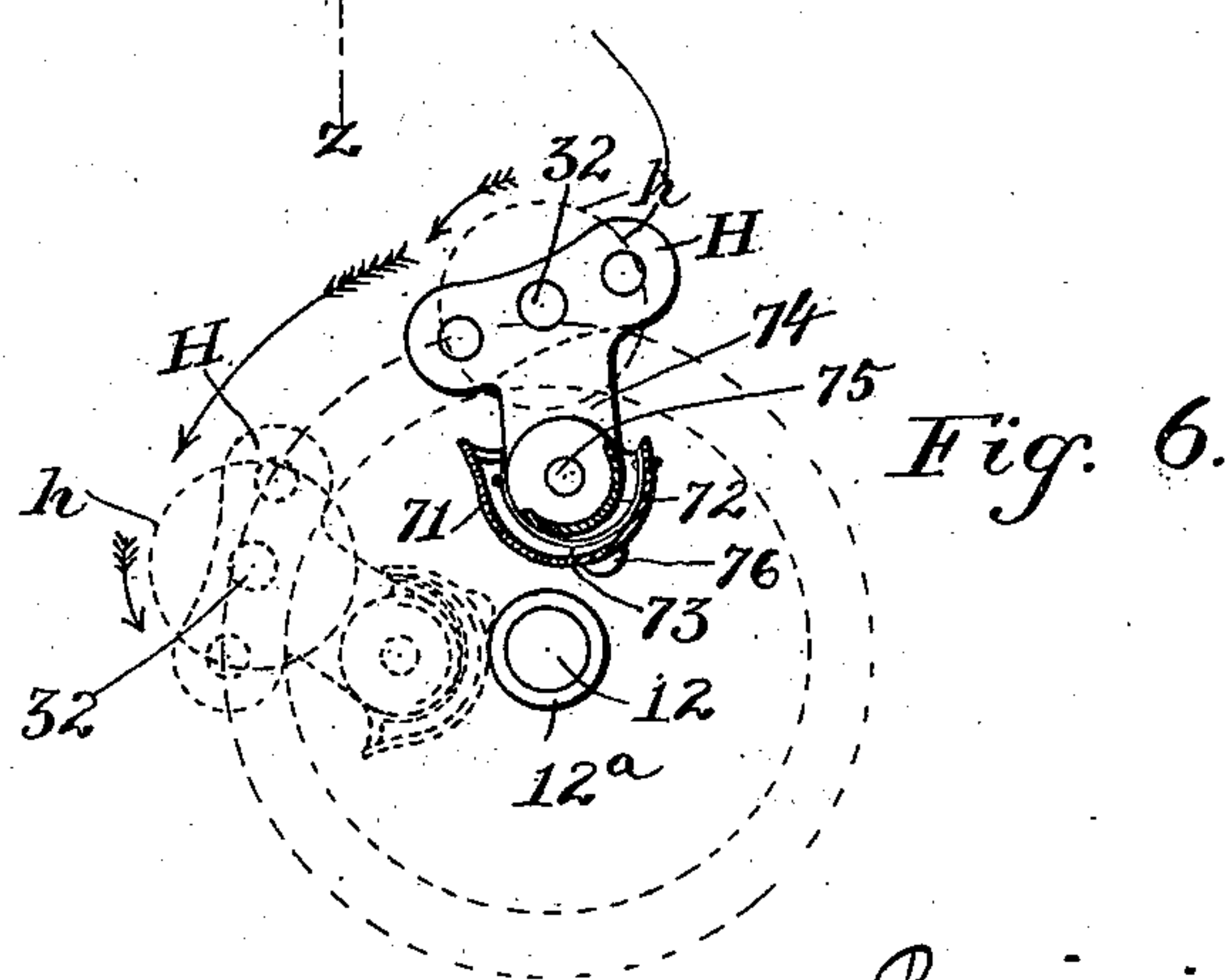
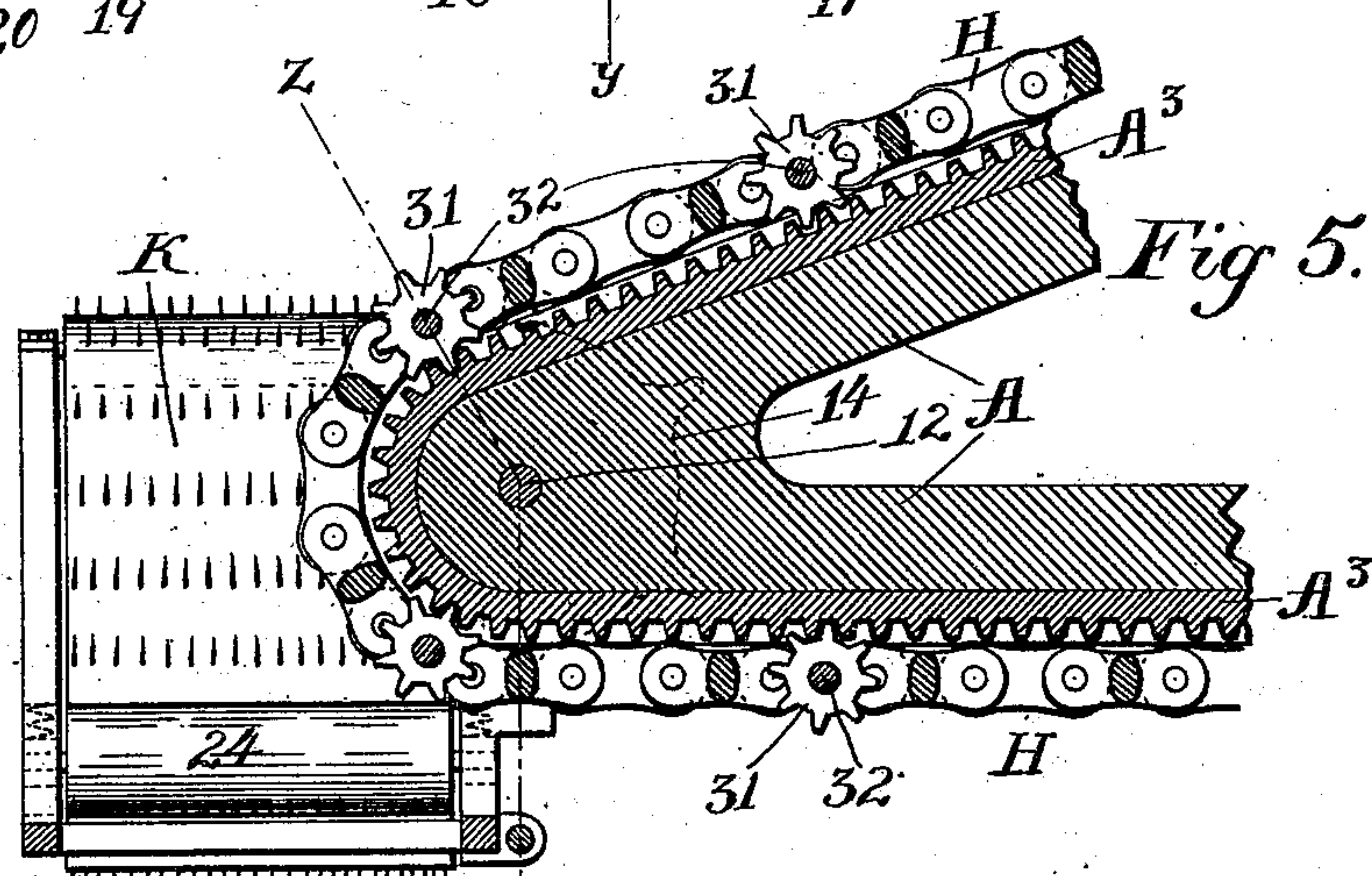
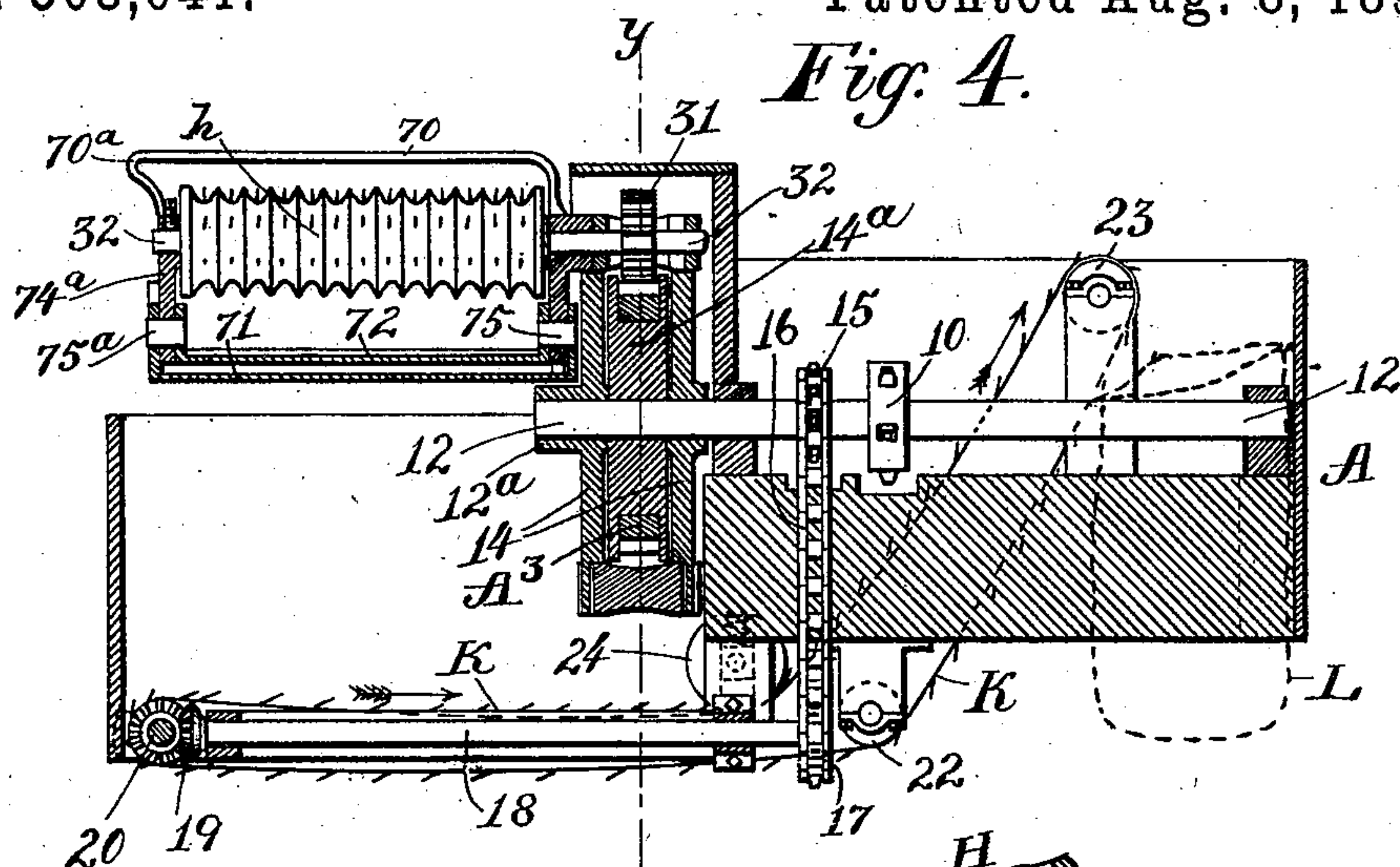
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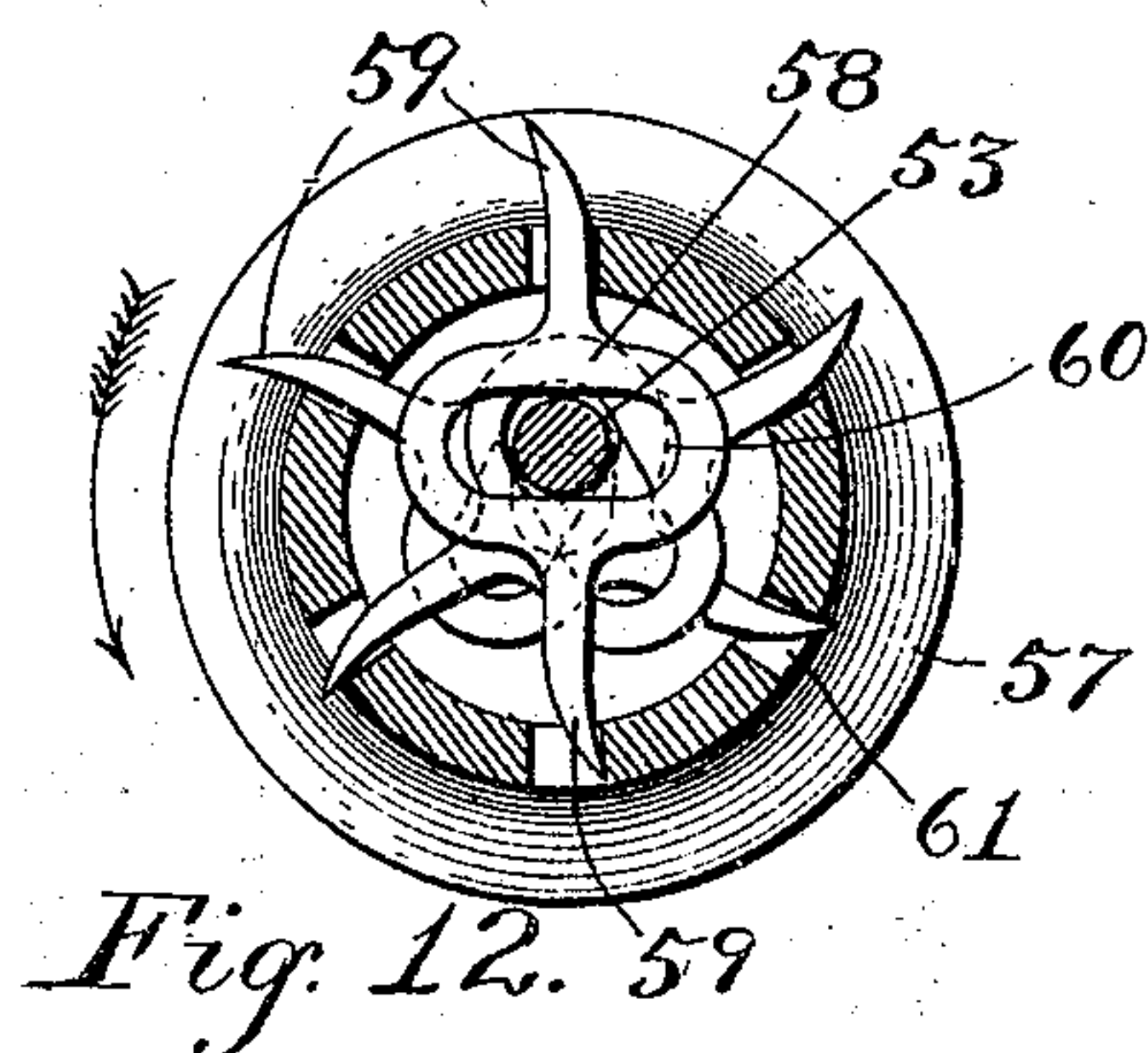
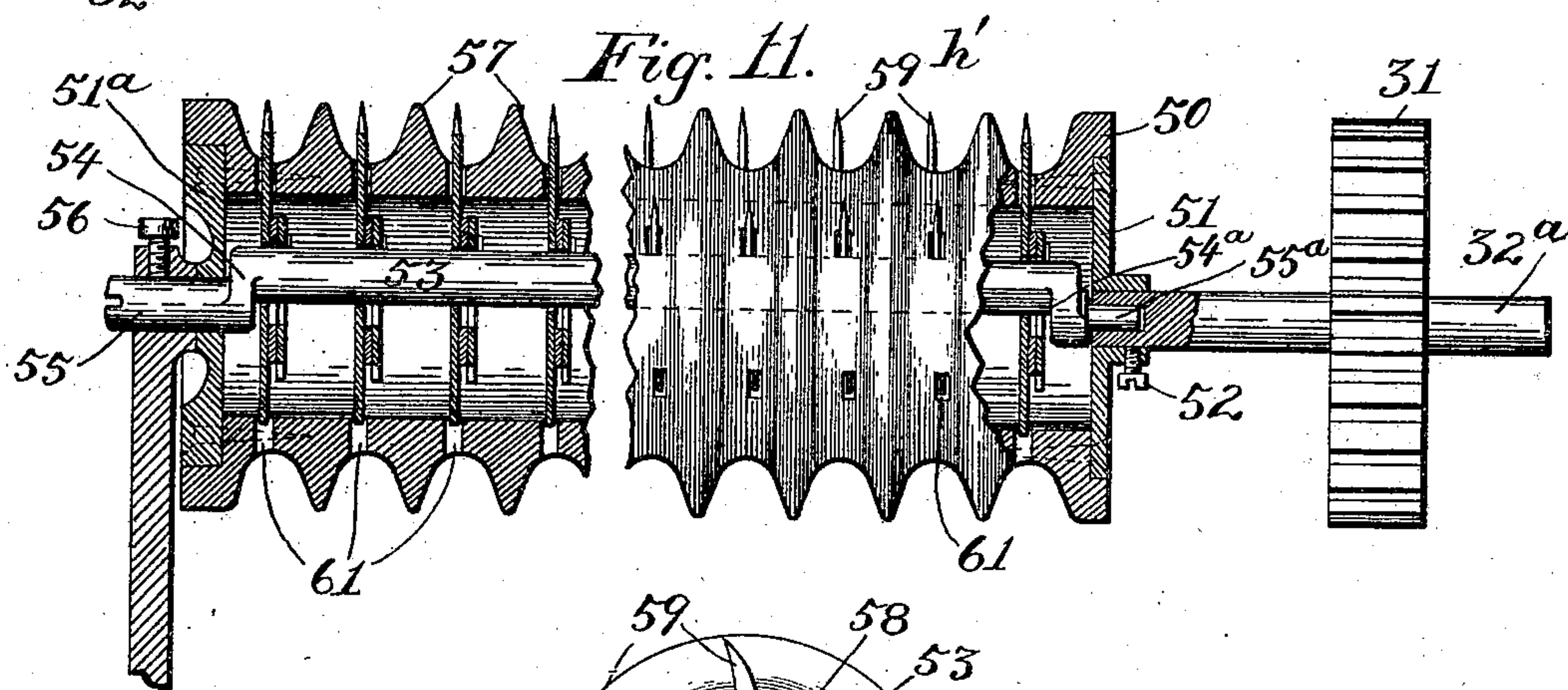
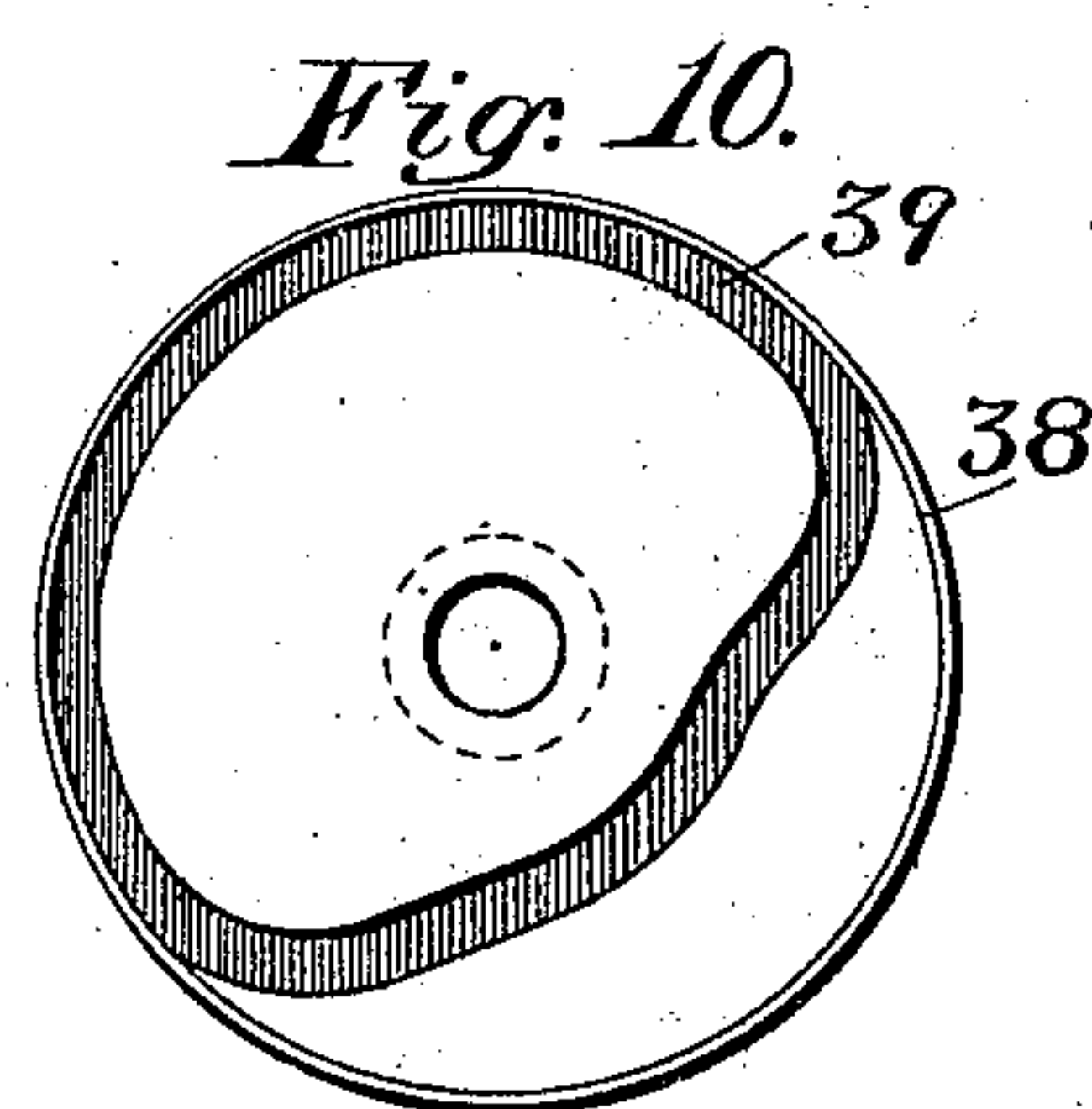
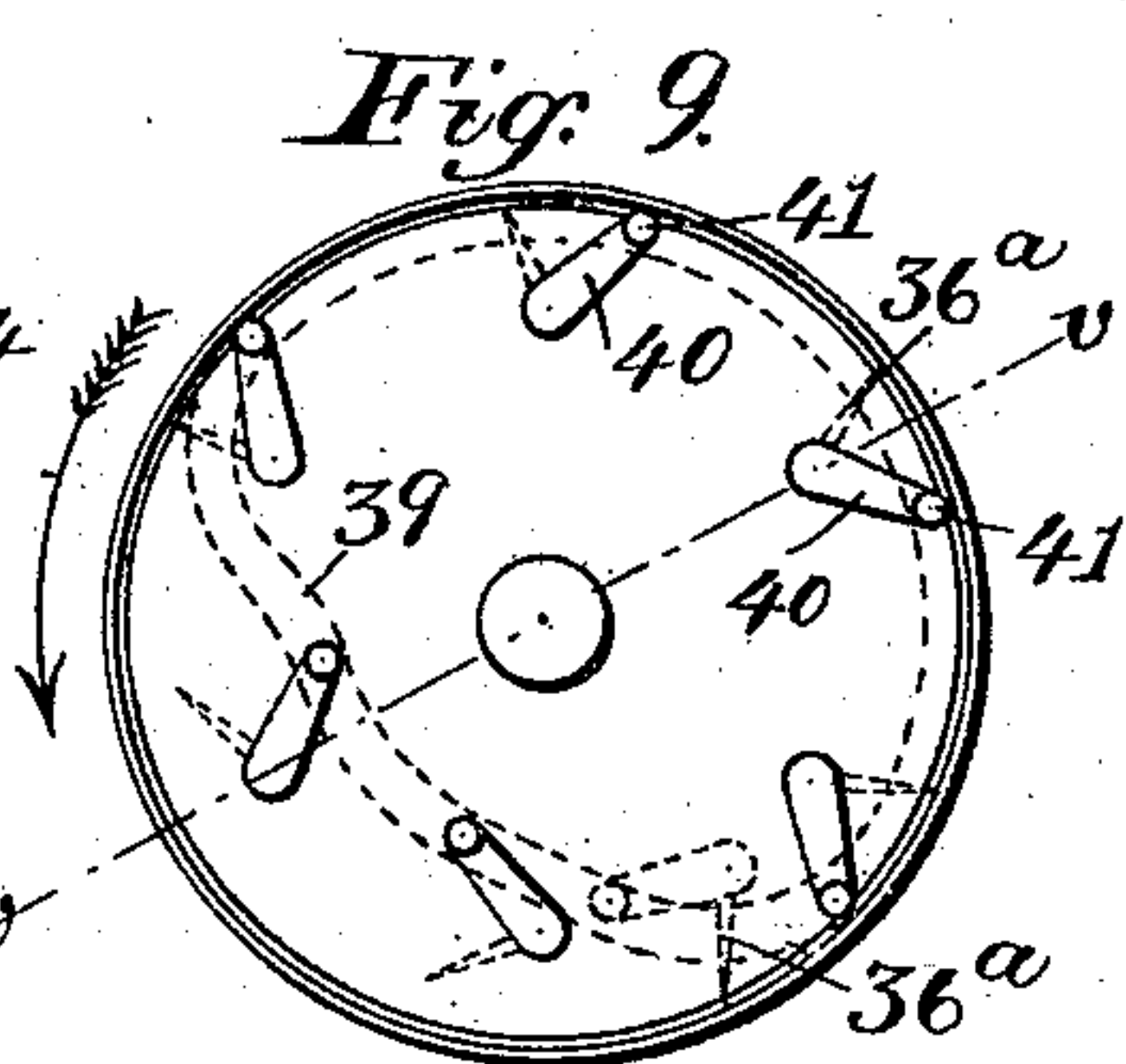
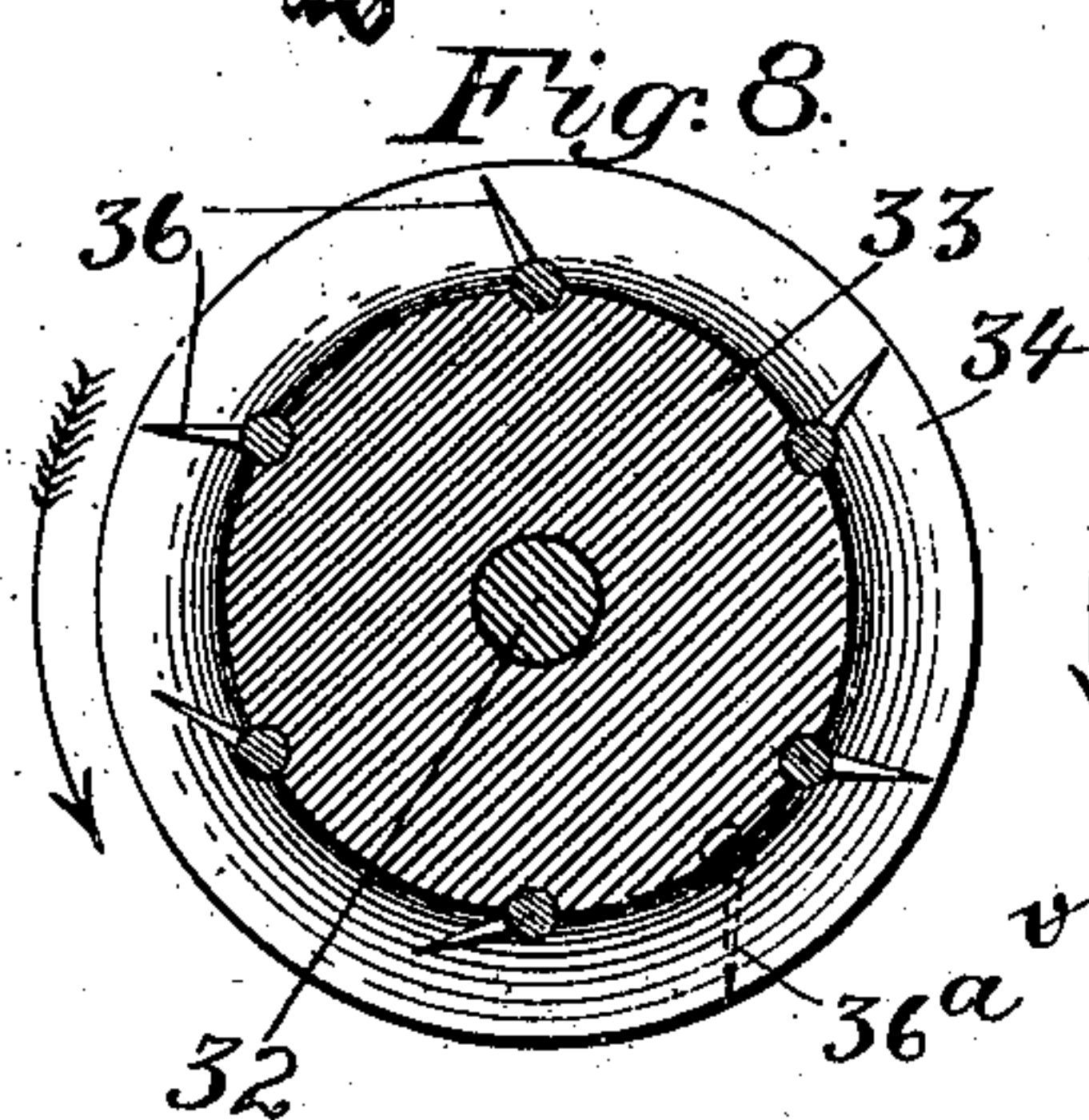
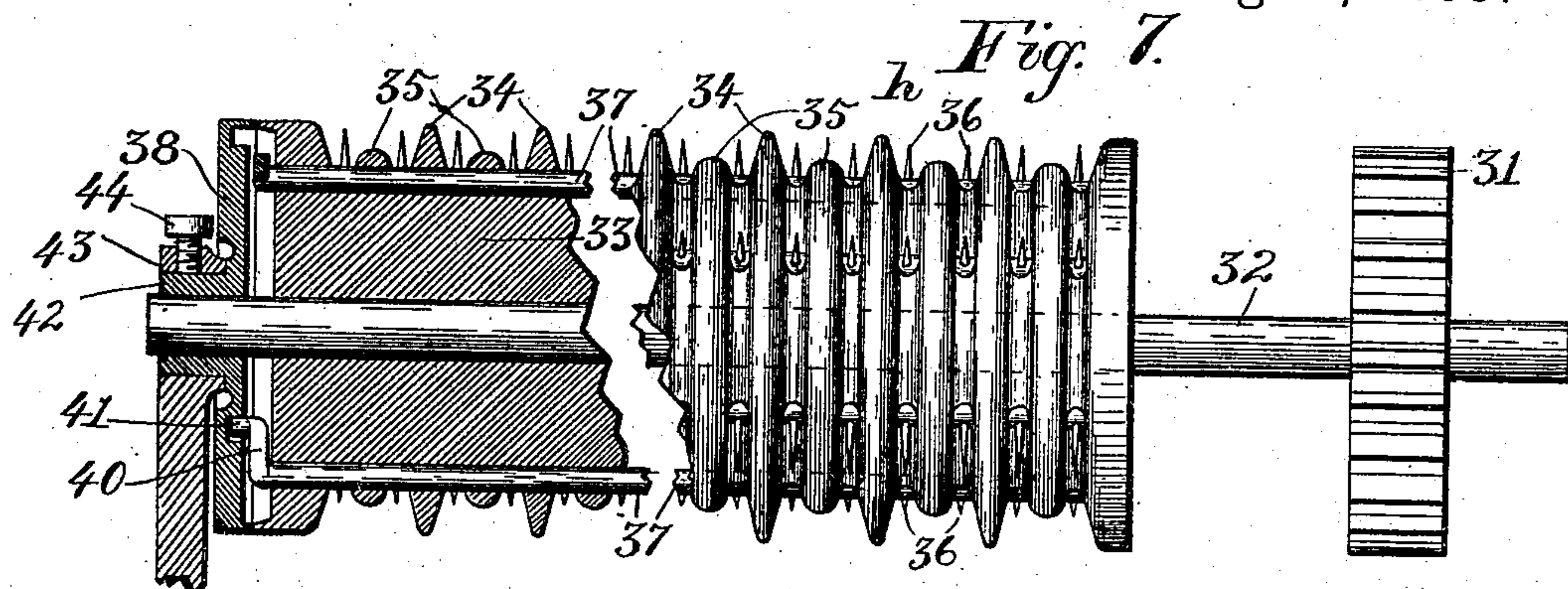
(No Model.)

B. GAUSE.
COTTON HARVESTER.

5 Sheets—Sheet 5.

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UNITED STATES PATENT OFFICE.

BENJAMIN GAUSE, OF BROOKLYN, ASSIGNOR TO JOHN C. CALHOUN, OF
NEW YORK, N. Y.

COTTON-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 503,041, dated August 8, 1893.

Application filed August 25, 1892. Serial No. 444,041. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN GAUSE, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Cotton-Harvesters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in cotton harvesters, and it consists of certain novel features hereinafter described and claimed.

Reference is had to the accompanying drawings, in which the same or corresponding parts are indicated by the same letters and numerals throughout the several views.

Figure 1 represents a side view of a cotton-harvester, parts being broken away. Fig. 2 represents a plan view of the same parts being broken away. Fig. 3 represents a vertical section along the line $x x$ of Fig. 2, looking in the direction of the arrows. Fig. 4 represents a section along the line $z z$, of Fig. 5, looking to the left. Fig. 5 represents a section along the line $y y$ of Fig. 4, looking to the left. Fig. 6 represents a diagrammatic view of a detached picker stem, and illustrates the method of discharging the cotton from the same. Fig. 7 represents a side elevation of a picker stem detached, the left of the said figure representing a section along the line $v v$ of Fig. 9. Fig. 8 represents a cross section through the picker stem shown in Fig. 7. Fig. 9 represents an end view of the picker stem cylinder after the detachable head has been removed, the cam groove in such detachable head being projected thereon in dotted lines. Fig. 10 represents the interior face of the detachable head for the picker stem cylinder, and illustrates the cam groove cut therein. Fig. 11 represents a sectional elevation of another form of picker stem adapted for use in my improved cotton harvester, and Fig. 12 represents a transverse section of the picker stem shown in Fig. 11.

A represents a framework mounted on traction wheels B just in rear of the center of gravity of the machine, and ordinary wheels B' mounted on the axle C, to which the draft

gear D is attached. In order that the machine may be turned readily, the framework A terminates at its forward end in a curved beam a high enough to allow the wheels B' to go under, and a fifth wheel a' similar to those commonly in use.

The framework A has on its lower right hand side a box A' through which the picker stems travel in their forward movement, and by which they are kept clear of the ground. This box A' has apertures A³ at each end for the admission and exit of the sprocket chain, and the picker stems carried thereby, and its forward end has a nose a^3 rounded at a^4 , and sloping upward at a^2 for deflecting the low lying branches of the cotton stalk. The sprocket chain, and mechanism for turning the picker stems travel in the box A² attached to the upper part of the frame A.

E represents a seat for the driver.

F. and F' represent boxes mounted on the machine for the empty sacks, or for carrying a full sack or two, if desired. These boxes are omitted in Fig. 2, for the better illustration of the mechanism lying beneath them.

H represents the sprocket chain to which the picker stems h are revolvably attached, the said sprocket chain being driven by suitable sprocket wheels, and traveling in the direction of the arrows. In order that the picker stems may rise and fall in each cotton bush without any longitudinal movement over the ground, this sprocket chain is so arranged that it will travel backward with the same speed with which the machine goes forward, which will cause the picker stem to have a vertical movement relative to the ground without any horizontal movement. Should, however, a small horizontal movement be desired at the same time, the sprocket chain may be readily so geared as to accomplish this result.

K represents a carrier for carrying off the cotton dumped from the picker stems, and L represents a bag or other receptacle suspended beneath the end of this carrier in any convenient way.

To enter more into the details of the machine, the traction wheels B are keyed on the shaft 1 journaled in the frame A, and on this same shaft the cog wheel 2 is mounted.

This cog wheel gears into the pinion 3 mounted on the shaft 4, which shaft also carries the sprocket wheels 5 and 6 driving the chains 7 and 8, and sprocket wheels 9 and 10, respectively. The sprocket wheel 9 turns the shaft 11, and sprocket wheel 13, which latter drives the forward loop of the sprocket chain H carrying the picker stems *h*. The sprocket chain 8 turns the sprocket wheel 10, shaft 12, and sprocket wheels 14 and 15. The sprocket wheel 14 drives the rear loop of the sprocket chain H carrying the picker stems. The object of having two sprocket wheels 13 and 14 to drive the one chain H is to lessen the binding effect of the said chain, and to distribute the strain on the sprocket chain H, on two bearing centers.

13^a is an idler sprocket wheel to raise the links slightly as they pass over the apex of the machine. The sprocket wheel 15 drives the sprocket chain 16, sprocket wheel 17, shaft 18, and miter wheels 19 and 20, by which motion is given to the drum 21 which drives the apron K. This apron is preferably provided with projecting spikes or tacks as shown, and passes under the idlers 22 and 24, and over the idler 23, in the direction indicated by the arrow in Fig. 4.

The sprocket wheel 14 consists of two side disks held apart by a suitable block 14^a. Between these disks the pinions 31 mounted on a shaft 32, carrying the picker stems pass freely. These pinions 31 engage in a fixed rack A³ on the frame work A, and as the sprocket chain H travels along the picker stems are not only carried along bodily, but are given a rotary motion about their axes 32.

The picker stem shown in Fig. 7 consists of a corrugated cylinder 33 of wood or metal, having corrugations 34 and 35, between which corrugations the movable teeth 36 project, as will be hereinafter described. These teeth are fixed upon oscillating rods 37 fitting in suitable recesses in the block 33, and terminating in crank arms 40, and crank pins 41, which latter engage in the cam groove 39 in the detachable and adjustable head 38. This head 38 has a circular shoulder 42 perforated for the picker stem shaft 32 and clamped at the desired position in the bearing 43 by means of the clamp screw 44. This head 38 is thus held in its bearing, while the picker stem revolves with the shaft 32.

The operation of the picker stem is as follows:—Assuming that the stem shown in cross-section in Fig. 8, and in side elevation in Fig. 9, is rising vertically in a cotton bush at the same time that the picker stem is rotating on the shaft 32 in the direction shown by the arrow, the fluffy cotton will press down between the corrugations, and will be caught by the teeth 36 and carried around until the position 36^a is reached, at which time the cotton will be dropped into a receptacle carried by the picker stem to be hereinafter described.

By having the crank pins 41 travel in a cam

groove 39, the teeth may be arranged to support the cotton without throwing it off by the centrifugal motion, until the desired position for dropping the same is reached, and this same adjustment of the teeth will prevent the picker stem from winding the cotton round itself, and so rendering itself inoperative. By having the cylinder head 38 adjustable each picker stem may be set independently of the others so that the teeth will catch the cotton and will drop the same at the proper time.

In the form of picker stem shown in Fig. 11 a hollow cylinder 50 is secured to the heads 51 and 51^a, and is revolved by the shaft 32^a clamped to the head 51 by the clamp screw 52. The long crank pin 53 runs through the cylinder 50, and has its forward end joined to a crank 54^a, which is journaled at 55^a in the center of the shaft 32^a. The outer end of the said crank pin is joined by the crank 54 to the fixed shaft 55, which is set at the desired position by the clamp screw 56. This hollow cylinder is corrugated as at 57, and has teeth 59 on opposite sides of the yoke piece 58. This yoke piece 58 has an oblong slot 60 so arranged that the crank pin 53 will move the teeth 59 in one direction and its opposite, but will not move them at right angles thereto. These teeth move out and in through apertures 61 in the shell of the corrugated cylinder 50. By means of the clamp screw 56, the long crank pin 53 may be so adjusted that the teeth will be projected to their farthest extent when they are in the uppermost position, and may be withdrawn entirely within the cylinder shell when they are in the lower position, as shown in Fig. 12. Or the teeth may be adjusted to protrude farthest before or after coming to the vertical position, with corresponding withdrawal at the position one hundred and eighty degrees therefrom. It will be seen that the teeth on each picker stem may be adjusted independently of the other picker stems as with the device shown in Fig. 7. In both forms of picker stems the teeth should never project beyond the outer edge of the corrugations, so that leaves, twigs, bolls, and other parts of the cotton plant or weeds growing therein may not be caught by the teeth, while the fluffy cotton will press in between the corrugations and will engage in the teeth, and the cotton will be dragged out of the bolls, free from foreign matter.

In order that branches of the cotton stalk lying longitudinally along the cotton row may not press in between the corrugations and catch the teeth, I provide guards 70, having horns 70^a, the said guards being over the picker stem, and together with the said horns pressing the branches of the cotton stalk to one side or the other as the picker stem rises in the bush. As it descends in the bush the same function is performed by the cups 71 which are suspended beneath the picker stem for the purpose of catching the cotton, as it

falls from the picker stem, and for carrying it to the endless apron K upon which it is deposited.

The link of the sprocket chain in which the shaft 32 is journaled, see Fig. 6, carries a downward projecting arm 74 fitted for a shaft 75 beneath which is suspended a cup 72, and an outer cup 71, the two being connected together by a flat spring 73, and both oscillating about the same pivots 75, and 75^a, (see Fig. 4.) By having two troughs with a spring connection between the two, the jarring of the machine as it passes over the irregularities in the cotton field, such as clods, stones, &c., is to a large degree prevented from swaying the troughs about their axes, causing the cotton to be prematurely shaken out. The spring between the two gives a connection sufficiently yielding for this purpose, as also for inequalities of pressure in the downward descent of the troughs through the cotton stalks, and yet sufficiently firm for dumping the interior trough when the exterior is tripped, as will hereinafter be described. The outer end of these troughs or cups is supplied with a vertical projecting arm 74^a in which the outer end of the shaft 32 is pivoted. The troughs 71 and 72 thus move at all times beneath the picker stems, and the teeth of the picker stem are so set that they will drop the cotton into the said troughs as described with reference to Figs. 8 and 9. The said troughs are emptied on to the apron by the device shown in Fig. 6, where 12^a is a sleeve or collar on the shaft 12, and 76 is a boss on the trough 71. As the sprocket chain moves in the direction indicated by the arrow around the sprocket wheel 14 which is situated on the shaft 12, this boss 76 will strike the said collar 12^a tilting the trough 71 backward, and also the trough 72 connected by the spring 73 to the said trough 71, and emptying the cotton out on the apron K.

The operation of the machine is as follows:—

The machine is driven between the rows of cotton so that the picker stems will engage the branches on one side of the row, the said picker stems moving backward as fast as the machine goes forward will rise vertically through the cotton branches pressing them gently to one side, while the teeth will snatch the cotton out of the bolls. After passing upward on the front half of the machine, the picker stems will descend vertically downward between the cotton branches, thus going over the same plant twice, and effectually removing any cotton that passes within reach of the teeth. By having the teeth counter-sunk beneath the corrugations, leaves, twigs, &c., will lie flat on the edge of the revolving picker stems without catching in the teeth, to the mutual damage both of the plant, and of the machine, while the fluffy cotton will be snatched out by the rapidly revolving teeth. The cotton will be deposited from the picker stems into the troughs dependent therefrom,

and will be dumped out of these troughs on to the traveling apron in the manner already described; and the said apron will carry it into a bag or other receptacle L, which receptacle may be detached and thrown off at the end of the row, or may be placed in one of the boxes F or F', which carry the empty receptacles. The box A' has a horn α^3 which will pass beneath the lowest lying branches, and will lift them up so as to engage the picker stems emerging from the said box. By having the height of the machine sufficient, the picker stems may pass up and down through any height of cotton; but if desired two or more sizes of the machine may be constructed to gather from low or high cotton plants.

The guard 70 will prevent the mutilation of the cotton plants or the injury to the teeth from longitudinal stems or branches.

It will be obvious that the picker stems may be made to rise and descend at an incline in the cotton plant; that the picker stems may be placed on either or both sides of the machine, and that many other modifications might be made which would readily suggest themselves to any one skilled in the art, and which could be used without departing from the spirit of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a cotton harvester, the combination of a plurality of picker stems, means for moving the said picker stems first upward through the cotton plants and then downward through the plants, and at the same time moving the picker stems backward at approximately the same speed that the harvester moves forward, so that the operative picker stems may move approximately in a vertical direction relative to the ground, and means for simultaneously revolving said picker stems about their axes, substantially as described.

2. In a cotton harvester, the combination of a plurality of picker stems mounted on horizontal shafts, means for moving the said picker stems and shafts first upward through the cotton plants and then downward through the plants, and at the same time moving the picker stems backward at approximately the same speed that the harvester moves forward, so that the operative picker stems may move approximately in a vertical direction relative to the ground, and means for simultaneously revolving said shafts and picker stems about their axes, substantially as described.

3. In a cotton harvester, the combination with a suitable framework, of an endless sprocket chain stretched over sprocket wheels journaled in said framework; a plurality of picker stems mounted on horizontal shafts journaled in said sprocket chain, pinions keyed on said shafts, a rack fixed in said framework inclined upward and then downward from the front of the harvester and adapted to engage said pinions, and mechan-

ism for dragging said sprocket chain and pinions backward over said rack, substantially as and for the purposes described.

4. In a cotton harvester, the combination with a suitable framework of a sprocket chain moving over sprocket wheels set in said framework, the said sprocket chain being inclined first upward and then downward; a plurality of picker stems mounted on shafts journaled in said sprocket chain, the said picker stems having a plurality of movable teeth with means of adjusting the same; pinions keyed on to the shafts of the said picker stems; and a fixed rack mounted in said framework beneath said pinions and adapted to engage said pinions and to revolve said picker stems as said picker stems ascend and descend through the cotton plants, substantially as described.

5. In a picker stem for use in a cotton harvester, the combination with a central shaft and means for revolving the same; of a corrugated cylinder fixed on said shaft, and having cylindrical holes parallel to said shaft at the base of said corrugations, rods loosely mounted in said holes and having teeth projecting between said corrugations; a crank and crank pin at the end of said rods, and an adjustable head held against turning and having a cam groove therein engaging said crank pins and moving said rods and the teeth thereon, substantially as and for the purposes described.

6. In a picker stem for use in a cotton harvester, the combination with a central shaft and means for revolving the same; of a corrugated cylinder fixed on said shaft and having cylindrical holes parallel to said shaft at the base of said corrugations, rods loosely mounted in said holes and having teeth projecting between said corrugations; a crank and crank pin at the end of said rods; an adjustable head having a cam groove therein adapted to engage said crank pins, and a clamp screw for clamping said head in any desired position, substantially as and for the purposes described.

7. In a cotton harvester of the character described, a revolving picker stem having movable teeth adapted to catch in the cotton at one part of its revolution and to drop the cotton at another part of the revolution, a pivoted receptacle dependent from the picker stem and adapted to catch said cotton when it is dropped, a tripping device for tilting and emptying said receptacle, and means for moving said picker stem in a direction or directions at right angles to its axis and for revolving said picker stem about its axis, substantially as and for the purposes described.

8. In a cotton harvester of the character de-

scribed, a revolving picker stem having movable teeth adapted to catch in the cotton at one part of its revolution and to drop the cotton at another part of the revolution, a receptacle consisting of two curved troughs connected by a spring dependent from the picker stem and traveling therewith, adapted to catch said cotton when it is dropped, a tripping device for emptying said receptacle, and means for moving said picker stem in a direction or directions at right angles to its axis and for revolving said picker stem about its axis, substantially as and for the purposes described.

9. In a cotton harvester of the character described, a revolving picker stem having movable teeth adapted to catch in the cotton at one part of its revolution and to drop the cotton at another part of its revolution, a receptacle dependent from the picker stem and adapted to catch said cotton when it is dropped, a tripping device for emptying said receptacle, an endless apron for carrying off the cotton so emptied, and means for moving said picker stem in a direction or directions at right angles to its axis and for revolving said picker stem about its axis, substantially as and for the purposes described.

10. In a cotton harvester of the character described, a picker stem formed of a corrugated cylinder with teeth protruding between but not beyond said corrugations, and having a rod extending over the axis of said picker stem and in the plane of motion of the axis of said stem relative to the ground to guard the teeth thereof, means for projecting said teeth relative to said corrugated cylinder, and means for revolving said picker stems, substantially as and for the purposes described.

11. In a picker stem for use in a cotton harvester, the combination with a central shaft and means for revolving the same; of a corrugated cylinder fixed on said shaft, and having cylindrical holes parallel to said shaft at the base of said corrugations, rods loosely mounted in said holes and having teeth projecting between said corrugations; a crank and crank pin at the end of said rods, an adjustable head held against turning and having a cam groove therein engaging said crank pins and moving said rods and the teeth thereon; and a rod above said picker stem and parallel to the axis thereof, to guard the teeth, substantially as and for the purposes described.

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

BENJAMIN GAUSE.

Witnesses:

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ALEX. C. KING.