

No. 671,979.

Patented Apr. 16, 1901.

W. SAIGHMAN.
BAND CUTTER AND FEEDER.

(Application filed Feb. 28, 1900.)

(No Model.)

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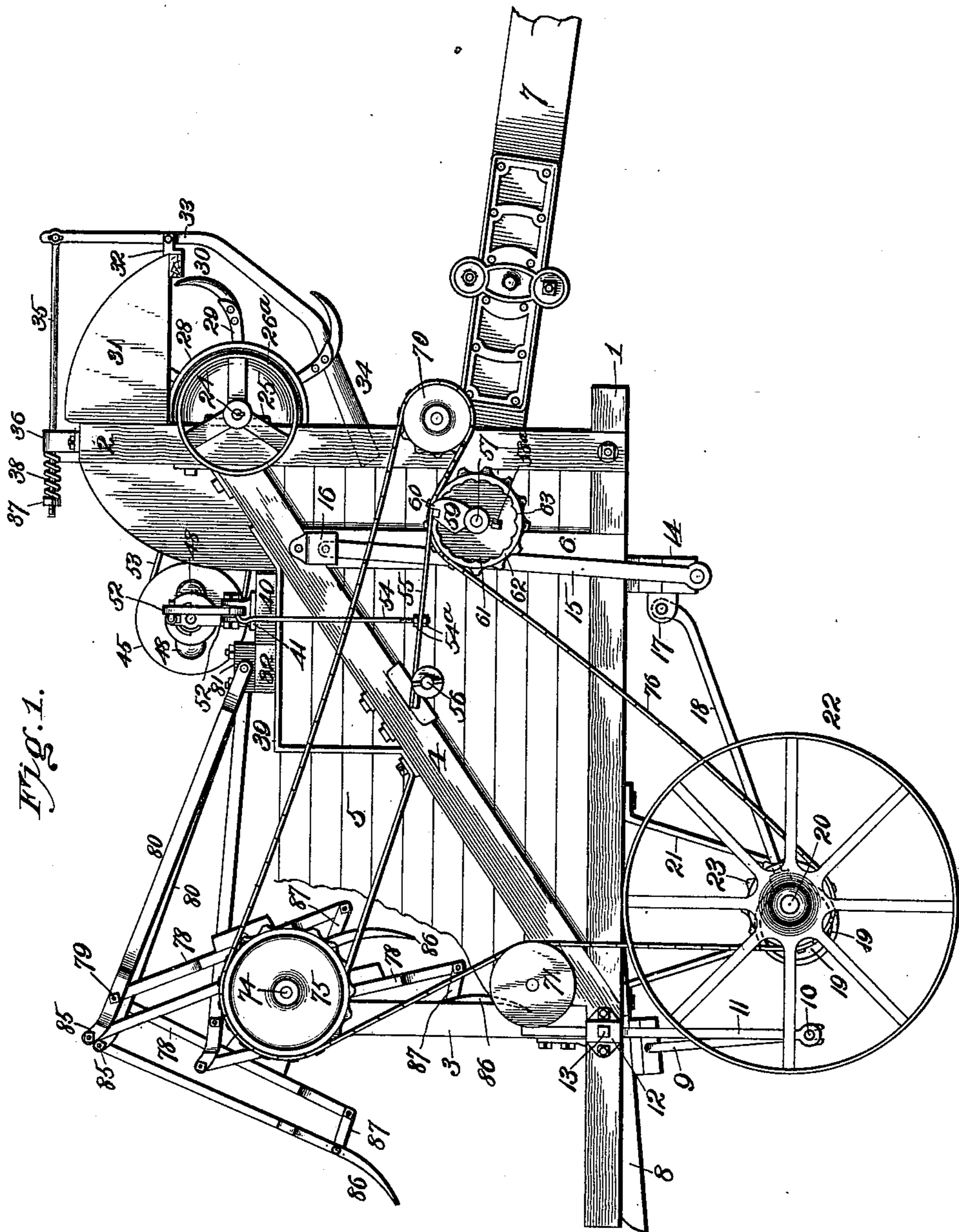


Fig. 1.

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Inventor:
W. Saighman

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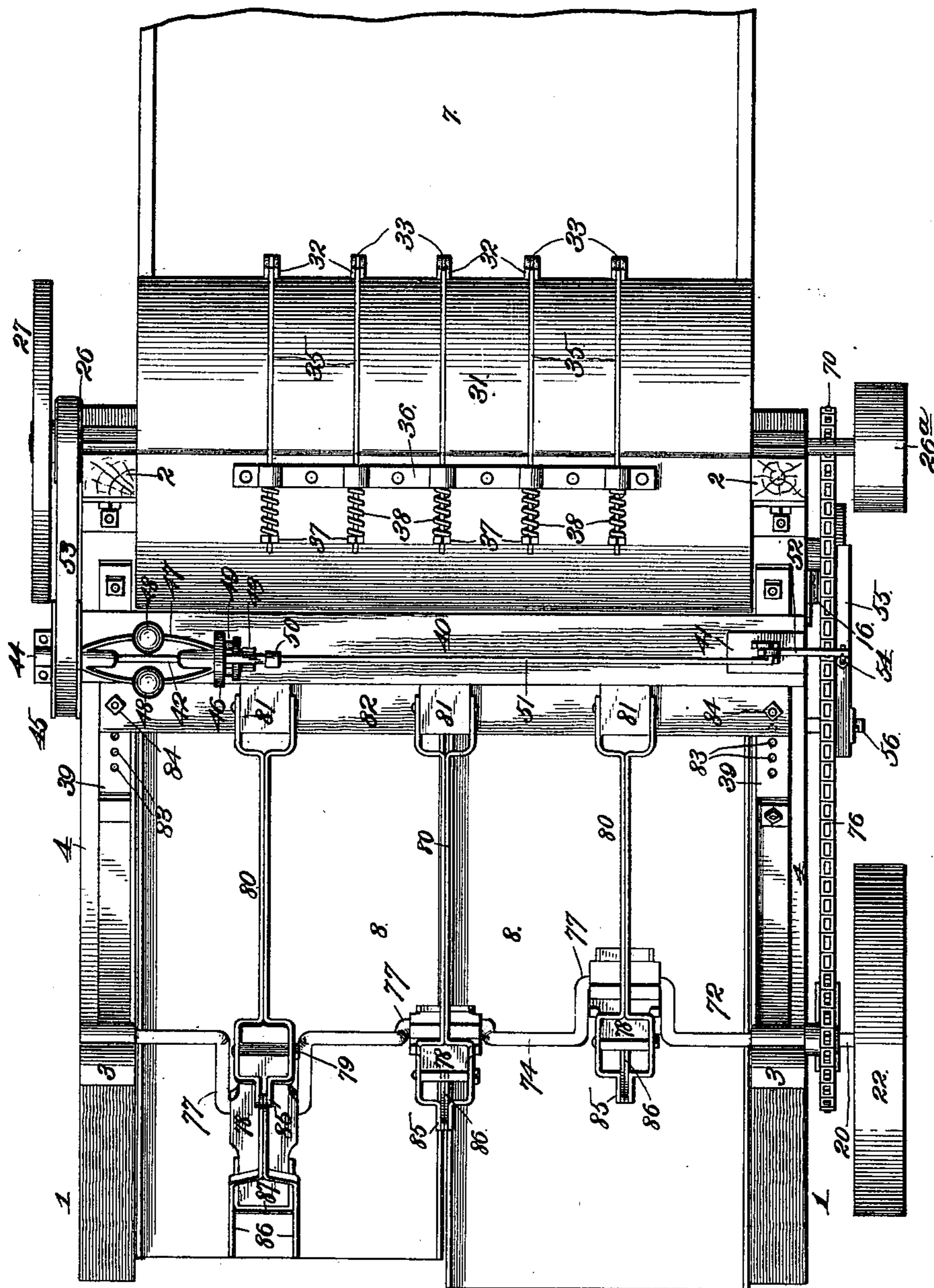
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Fig. 2.



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Fig. 3.

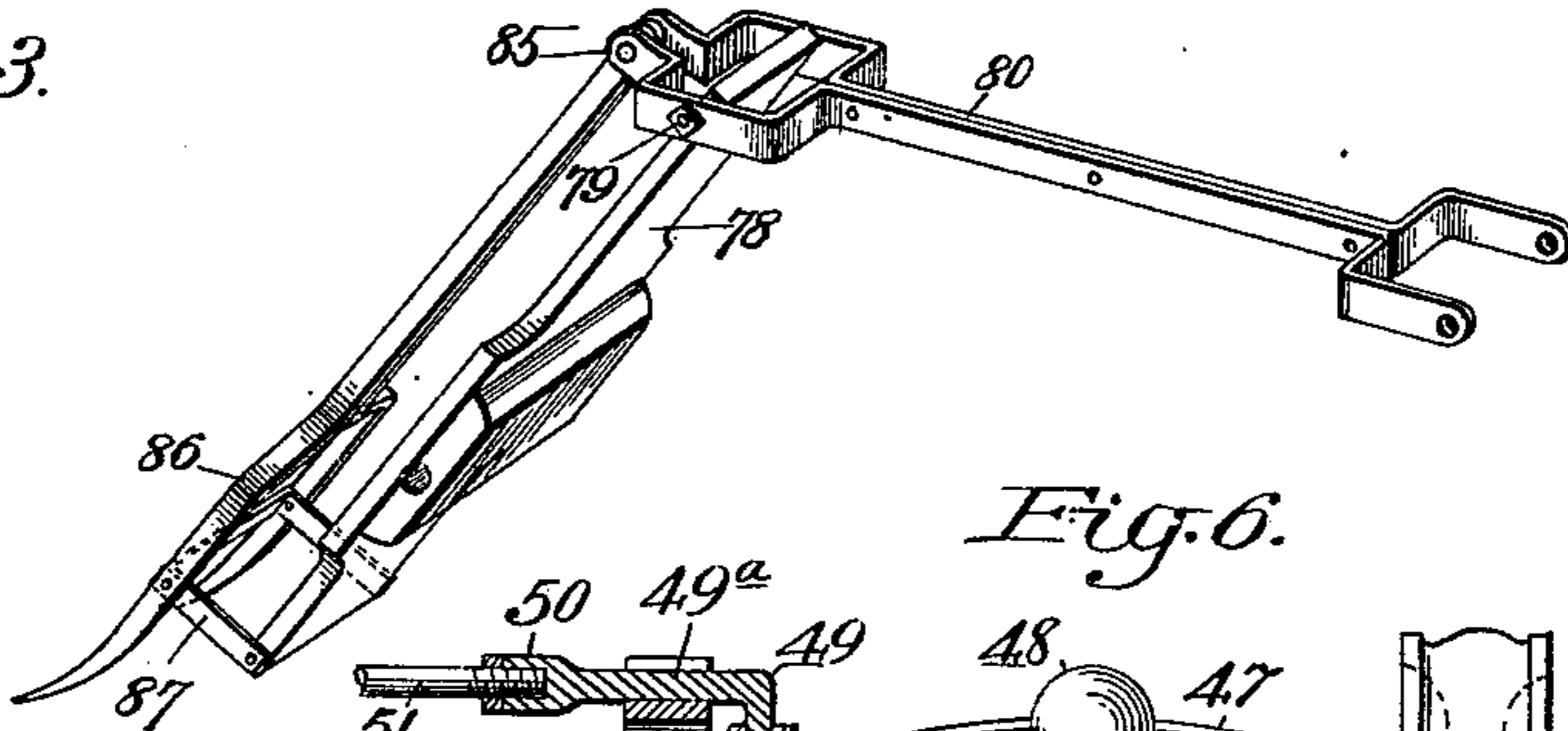


Fig. 6.

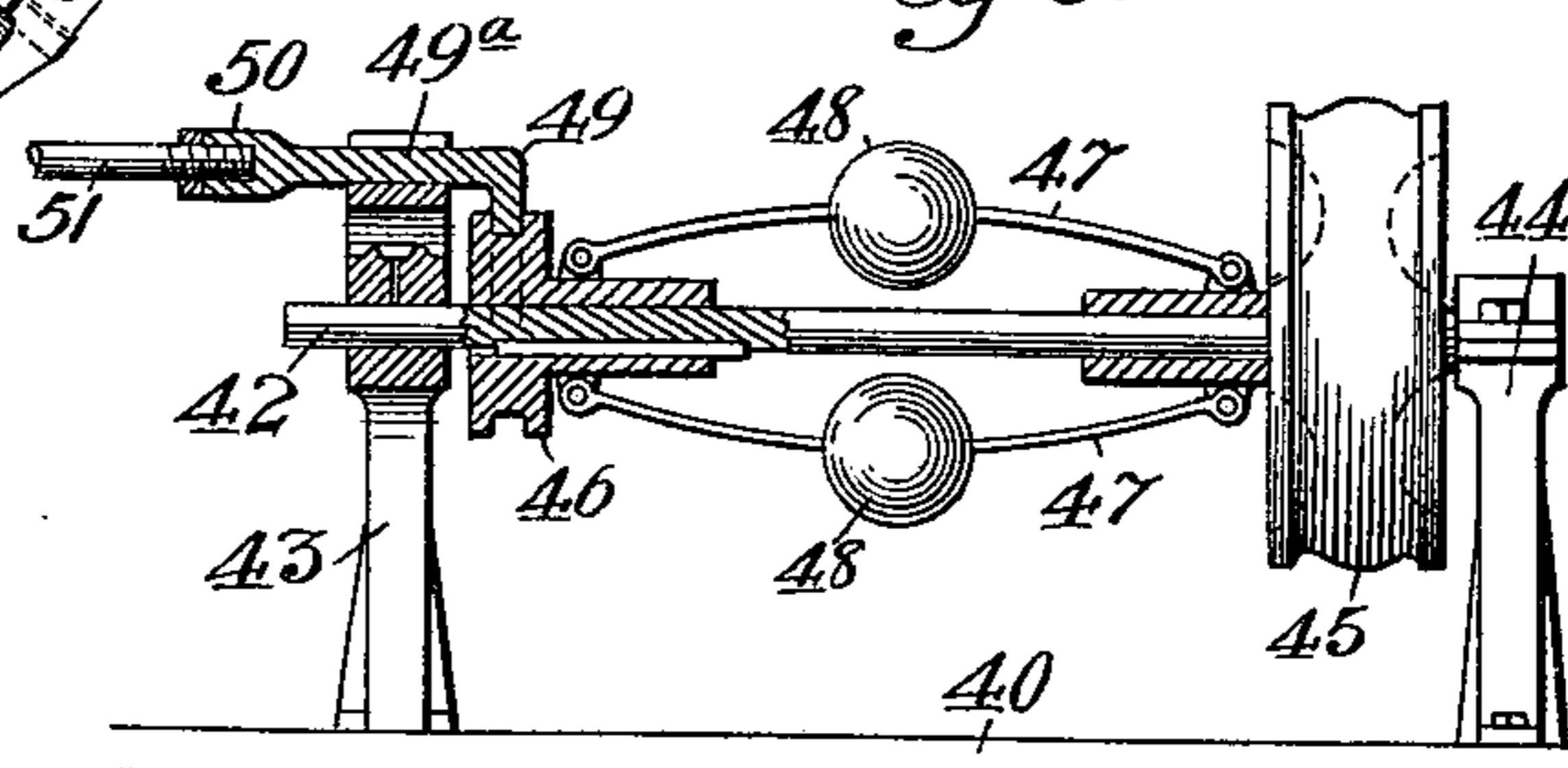


Fig. 4.

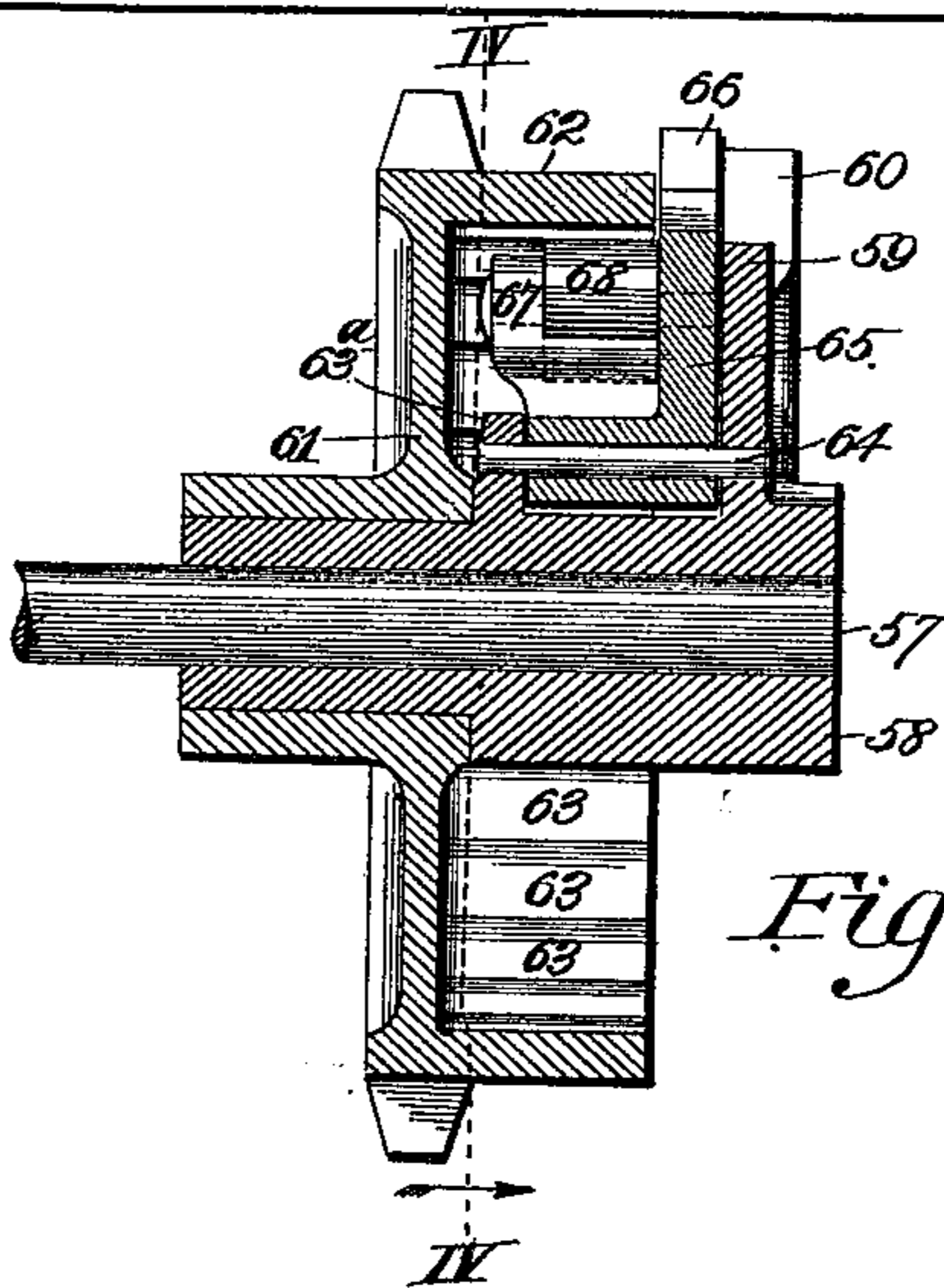
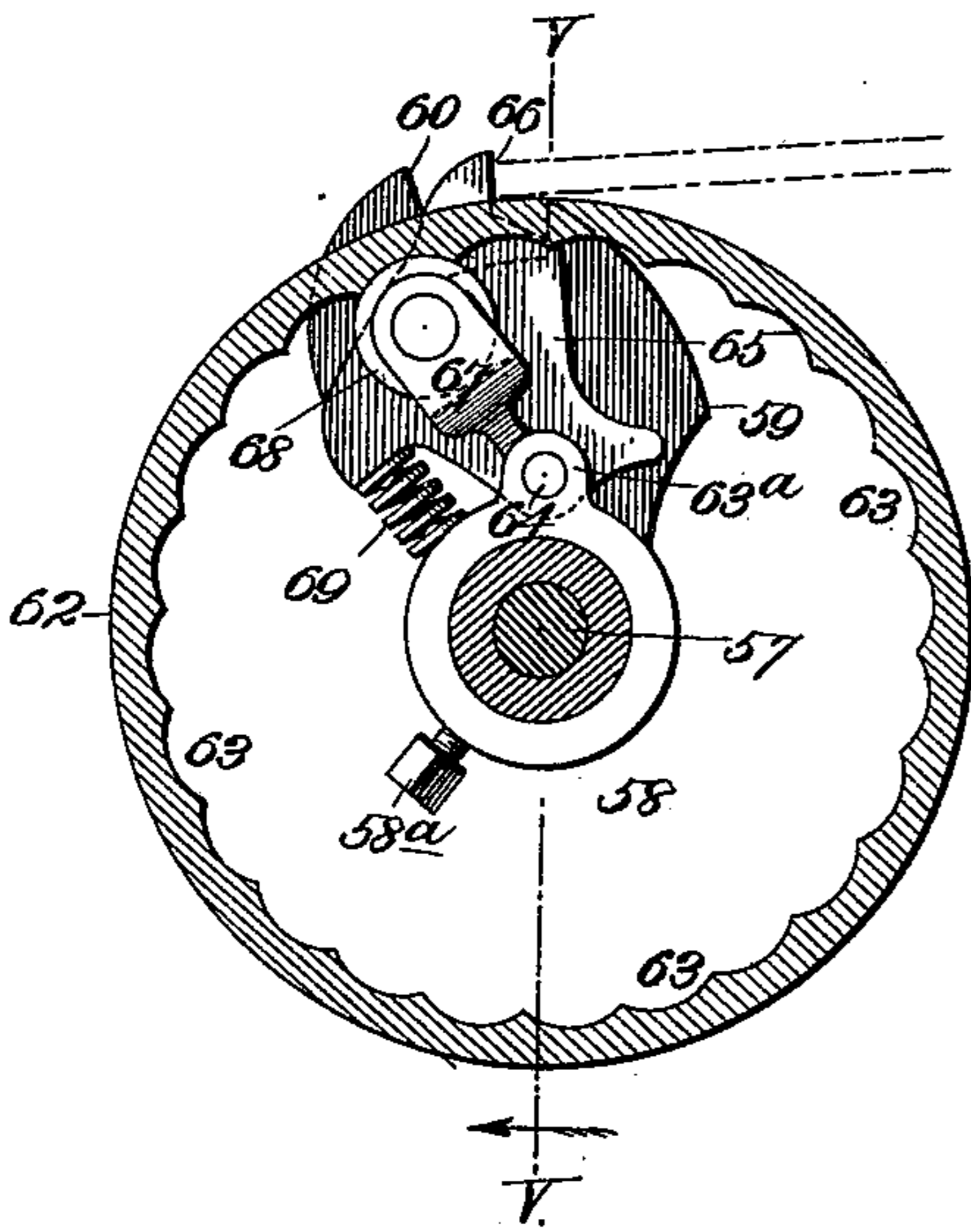


Fig. 5.

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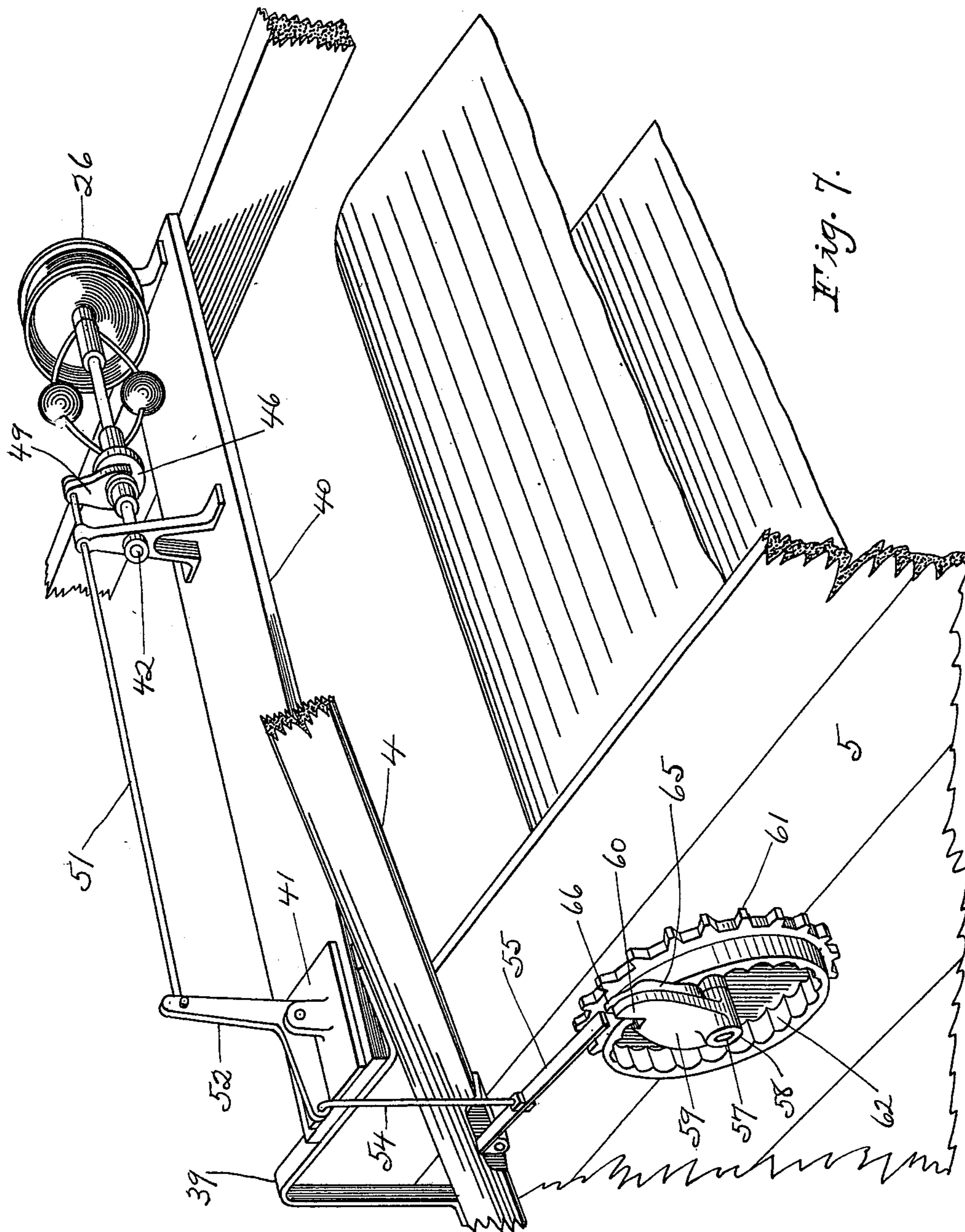
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4 Sheets—Sheet 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM SAIGHMAN, OF KANSAS CITY, MISSOURI.

BAND-CUTTER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 671,979, dated April 16, 1901.

Application filed February 28, 1900. Serial No. 6,818. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SAIGHMAN, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Band-Cutters and Feeders, of which the following is a specification.

My invention relates to self-feeders and band-cutters; and it consists in certain novel and peculiar features of construction and combinations of parts, as will be hereinafter described and claimed.

One object of the invention is to produce a machine of this character whereby the carrier is prevented from operating at an excessive speed, and thereby feeding the bundles to the cylinder so rapidly that there is danger of the machine being choked up.

A further object of the invention is the provision of swinging forks which facilitate the movement of the straw and grain upon the feed-pans.

Other objects of the invention will hereinafter appear and be pointed out in the appended claims.

Referring to the drawings, Figure 1 represents a side elevation, partly broken away, of a self-feeder and band-cutter embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a perspective view of one of the swinging forks. Fig. 4 is a section of the clutch, taken on the line IV IV of Fig. 5. Fig. 5 is a section taken on the line V V of Fig. 4. Fig. 6 is a vertical longitudinal section through the governor device for regulating the feed mechanism with some connected parts in elevation. Fig. 7 is a perspective view of the clutch, the governor, the upper end of the carrier, and the devices operated by the governor for controlling the clutch.

In the said drawings, 1 1 designate the longitudinal parallel sills of the machine, 2 2 uprights near its rear end, and 3 3 shorter uprights near its front or discharge end.

4 4 designate inclined brace-timbers secured at their lower ends to sills 1 and against uprights 3 and at their upper ends to uprights 2.

5 designates the boards which form the sides of the machine, and 6 vertical timbers adjacent to the rear uprights 2.

7 designates the usual or any preferred carrier-frame whereby the uncut bundles are fed

to the band-cutter, hereinafter described, and 8 feed-pans, of the usual or any preferred construction, which form the bottom of the machine and are mounted near their front ends upon the rock-bars 9, (only one of which appears,) pivoted at their lower ends upon the cross-rod 10, carried by the adjustable rods 11, said rods extending through the sleeves 12 and secured at the required point of adjustment therein by means of the set-screws 13. By this arrangement the front ends of the feed-pans may be vertically adjusted, and in operation said pans rock upon the cross-rod 10. 14 designates cross-timbers (only one of which is shown) secured to the under side of said pans and carried at the lower ends of the swinging bars 15, pivoted at their upper ends in brackets 16, secured to the framework. In order to cause said pans to reciprocate back and forth, each cross-bar is provided with an ear 17, which is pivotally connected to the front end of the link 18 of an eccentric 19, mounted upon shaft 20, said shaft being journaled, preferably, in brackets 21, depending from the sills 1. A belt-wheel 22 is secured upon one end of the said shaft and is geared by a belt (not shown) to the cylinder-shaft or other suitable shaft of the threshing-machine, (not shown,) and mounted also upon shaft 20 is a sprocket-wheel 23, the object of which will be hereinafter described.

24 designates the shaft of the rotary band-cutter, and said shaft is journaled in boxes 25, secured to uprights 2. The rotary cutter comprises the cylinder or frame 28, mounted upon said shaft, the arms 29, projecting radially therefrom, and the curved knives 30, riveted to said arms and adapted to sever the bands by which the bundles of grain are secured. Upon said shaft, near one end, are a belt-wheel 26 and a fly-wheel 27, and at its opposite end is a belt-wheel 26^a, to which motion is imparted by means of a belt (not shown) in order to cause the knives to sever the bands.

The rotary cutter is covered or enveloped by a hood 31, and secured to the same are a plurality of brackets 32, said brackets being arranged alternately with respect to the knives of the cutter. 33 designates a series of levers pivoted vertically in said brackets and terminating at their ends in blades 34,

extending downward and forward and having their lower or cutting edges presented toward the bundles carried endwise on the carrier, so that the bands on the bundles will be cut by said blades 34 if not cut by the rotary knives 30. The upper ends of said knife-levers are pivotally connected to the slide-rods 35, extending through a bracket 36 upon the hood or framework, and engaging the rear ends of said rods are adjustable collars or nuts 37, engaged by the expansive coil-springs 38, encircling the rods and bearing at their opposite ends against said collars or nuts and said bracket 36. By this arrangement the knives 34 are permitted to yield in case of an unusual or excessive accumulation of the material passing on the carrier or in case of contact with any hard foreign matters accidentally getting on the carrier, so that chances of injury to the blades are lessened.

39 designates a pair of angular brackets which are bolted to the braces 4, and 40 a cross-bar secured thereon and provided at one end with a bracket 41. The shaft 42 of a governor of a type in common use is journaled in a standard 43 upon said bar and a bearing 44 supported from the framework. Said governor is provided with the usual belt-wheel 45 and with a grooved disk 46, keyed to slide upon the shaft in the customary manner and connected to the wheel by means of the spring-arms 47, carrying governor-balls 48, so that as the speed of rotation becomes high the centrifugal action or force of the balls will cause them to describe a greater circle, and thereby slide the grooved disk toward the wheel. The groove of this disk is engaged by a yoke 49 on the end of a short rod 49^a, adapted to reciprocate in an open slot in the top of the standard 43 and connected at 50 to a link-rod 51, extending transversely of the machine and pivoted to the upper end of a bell-crank lever 52, which responds instantly to each variation in the speed of the governor, the latter being driven from belt-wheel 26 by means of the belt 53, connecting said wheel with the governor-wheel 45. The horizontal arm of the bell-crank lever 52 is pivotally connected to the pendent rod 54, and the latter extends through and is adjustably connected by the nuts 54^a to the stop-bar 55, mounted pivotally at its front end upon the stub-shaft 56, projecting from the framework.

57 designates the front shaft of the carrier, and 58 a sleeve which is secured thereon by means of a set-screw 58^a or its equivalent. At its outer end said sleeve is provided with an arm 59, bifurcated to provide the forwardly-disposed shoulder 60. A sprocket-wheel 61 is journaled upon said sleeve and is provided with an annular flange 62, above the periphery of which projects slightly said shoulder 60, and said flange internally is corrugated or scalloped, as shown at 63.

63^a designates a lug projecting from sleeve 58, and 64 a pivot-pin secured at its opposite ends in said lug and the arm 59. 65 designates a dog pivotally mounted upon said pin and provided with a tooth 66, projecting beyond the periphery of flange 62. Said dog is provided with a lug or ear 67 within the sprocket-wheel and an antifriction-roller 68, journaled upon a pin connecting said lug or ear and the body of the dog, said roller being adapted for engagement with one or another of the corrugations or scallops of the flange and is held normally therein by means of an expansive spring 69, interposed between the heel of said dog and said sleeve.

In practice the governor is arranged to attain a predetermined speed before the drive-shaft 57 of the carrier is operated. Consequently it is clear that there is no danger of choking down the separator by feeding the straw to it before the separator has reached the speed at which it is desired to thresh—that is to say, as long as the governor operates below a predetermined speed the stop-bar 55 (see Fig. 1) is depressed and held in the path of the shoulder 60 of the arm 59 rigid upon shaft 57; but when the governor reaches the predetermined speed the centrifugal force exerted by the balls 38 operate the bell-crank lever 52 and raise the stop-bar 55 out of the path of said shoulder 60 and permit the spring 69 to swing dog 65 forward and cause the roller 68 to engage one of the corrugations or scallops of the sprocket-wheel, and thereby lock the latter rigidly upon the shaft. If the speed from any cause should drop below the requisite number of revolutions per minute, the stop-bar 55 is automatically depressed, so that as the clutch rotates the tooth 66 of dog 65 engages the end of said bar. The force with which this dog strikes the unyielding bar overcomes the power of spring 69 and throws the roller 68 out of engagement with the wheel, and at the same instant the momentum of the shaft and carrier is overcome by the contact of shoulder 60 of dog 59 with said bar, with the result that the movement of the shaft instantly ceases. If the dog 65 were depended upon solely to arrest the movement of the shaft, it is obvious that the spring 69, which would thus sustain the entire thrust, would have to be renewed at frequent intervals. By the successive engagement of the dog and shoulder 60, however, the latter relieves the spring before it is compressed sufficiently to injure it.

70 designates an idle sprocket-wheel journaled in the rear end of the machine, and 71 a guide-roller near the front end of the machine and above the roller 71, and journaled in bearings 72 at the upper ends of standard 3 is a crank-shaft 74, upon which is mounted a sprocket-wheel 75. The sprocket-wheels 61 and 75 are driven by the sprocket-wheel 23 through the medium of the endless chain 76, which is guided by the idle wheels 70 and 71, as shown in Fig. 1. It will thus be seen that the sprocket-wheel 61 rotates continuously and only imparts motion to the shaft 57 when the engine is running at sufficient speed to

permit the clutch-roller 68 to engage the
 corrugated or scalloped surface 63 of said
 sprocket. At other times said wheel turns
 loosely on the sleeve 58 of the clutch mech-
 5 anism. The shaft 74 is provided, preferably,
 with three equidistant cranks 77, so that the
 feeding-fork of one shall always be acting to
 discharge the straw from the pan into the
 10 thresher. The forks correspond in number
 to the cranks, and as they are of identical
 construction a description of one will suffice
 for all—that is to say, 78 designates a board
 or plate which is journaled at a suitable point
 upon the crank 77 and is pivoted at its up-
 15 per end, as at 79, to the link 80, said link
 consisting, preferably, of two bars secured
 together in order to possess the necessary
 strength and stiffness, and the rear end of
 said link is pivoted to the block 81, secured
 20 to cross-bar 82. The bar 82 is supported at
 its opposite ends upon the brackets 39, which
 are provided with a longitudinal series of
 openings 83 to receive the bolts 84, by which
 the bar 82 is secured in position. The front end
 25 of the link is pivoted, as at 85, to the upper
 end of the fork proper, 86, and said fork is
 pivotally connected by the link 87 to the
 lower end of the board or plate 78. The speed
 of operation of these forks can be varied in
 30 order to regulate the amount of grain which
 goes into the thresher and can be made to
 feed on any desired point of the threshing-
 cylinder either near the top or the bottom
 close down to the customary grain-plates.
 35 To accomplish this purpose, the bar 82 is ad-
 justed forward or backward on the perforated
 brackets 39, and thereby vary the plane of
 operation of the lower ends of the forks—
 that is to say, when the bar 82 is advanced
 40 the forks feed nearer the bottom of the cyl-
 inder, and when the bar is withdrawn and
 secured at about the position shown in Fig.
 2 the forks feed to a point near the top of the
 cylinder. This adjustment of the cross-bar
 45 can be accomplished while the machine is
 running at full speed, and therefore does not
 interfere with the threshing operation. The
 forks are positive in their operation and pene-
 trate the bundle a sufficient distance to pick
 50 it up and move it forward, and thereby feed
 the grain by degrees, just as would be done
 by hand. The speed of these forks is slow
 and positive, but they may be geared to run
 at a higher speed in case of bad or moldy
 55 grain in order that each bunch or bundle
 may be thoroughly disintegrated. In action
 the forks have compound movement. In
 other words, they not only act through the
 movement of the cranks, but in addition have
 60 an extra movement, whereby their sphere of
 action is extended—that is to say, as the
 cranks are about to descend the forks are in
 position to move almost vertically downward
 and are more elevated than usual, because
 65 the links 87 extend upward at an acute angle
 to the boards or plates 78. In such down-
 ward movement they penetrate the bundle

deeply, and as the cranks swing forward
 below their center of motion the links 87
 swing downward, and thereby tend to cause 70
 the forks to move forward almost in a hori-
 zontal plane, this movement continuing until
 after the cranks have swung some distance
 forward of their center. Then the forks be-
 75 gin to rise, and by reason of the peculiar re-
 lation between the crank and the fork, caused
 by the compound leverage connection between
 them, the fork is withdrawn from the bundle
 in the direction of its length, and thereby
 80 does not tend to interrupt the forward move-
 ment of the bundle nor disturb it, as would
 be the case if the fork in withdrawing contin-
 ued in a line concentric of the shaft 74, as
 will be readily understood. These forks are
 arranged, as hereinbefore stated, so that one 85
 of them shall always be moving forward in
 order that the grain shall be continuously
 advanced by positively-applied pressure, and
 thereby insure a uniform and even feed to
 the cylinder. Motion is imparted to the shaft 90
 20 through the medium of a belt (not shown)
 on the wheel 22, and from said shaft by means
 of chain 76 and the various sprocket-wheels
 motion is imparted to the carrier-shaft and
 crank-shaft 74. The operation of the shaft 95
 20 through the medium of the eccentrics 19
 and links 18 causes the reciprocatory move-
 ment of the feed-pans 8, and these acting in
 the customary manner cooperate with the
 forks in discharging the grain to the cylinder. 100

As the operation of the various parts has
 been described in detail, it is believed that a
 recapitulation of the operation will be unnec-
 essary, and it is to be understood that changes
 in the form, proportion, detail construction, 105
 or arrangement of parts will not be consid-
 ered a departure from the spirit and scope or
 sacrifice any of the advantages of the inven-
 tion.

Having thus described the invention, what 110
 I claim as new, and desire to secure by Letters
 Patent, is—

1. In a band-cutter and feeder, the combi-
 nation, with the carrier and its driving-shaft,
 of a sleeve 58, secured on said shaft, a sprocket 115
 61 rotatably mounted on said sleeve, a gov-
 ernor-shaft 42, means for simultaneously ro-
 tating said governor-shaft and said sprocket,
 an arm 59 and a lug 63^a on said sleeve, said
 arm being provided with a shoulder 60; an 120
 annular internally-scalloped flange 62 on said
 sprocket, a dog 65 pivoted between said lug
 and said arm, a tooth 66 and a lug 67, both
 carried by said dog, a pin or spindle connect-
 ing lug 67 with said dog, a roller 68 on said 25
 pin, engaging any one of the scallops of said
 flange, a spring 69 confined between said
 sleeve and the heel of said dog, a pivoted
 stop-lever or detent 55, having its free end
 movable in the plane of said shoulder and 130
 said tooth, a vertical rod connected to said
 detent, a horizontal rod 51, a bell-crank le-
 ver connecting said rods, a grooved collar
 loosely mounted on said governor-shaft 42, a

yoke or fork 59 secured to said rod 51 and engaging the groove in said collar, and a ball-governor connected to said collar and to said governor-shaft, whereby the fluctuations of
5 said governor cause said collar to slide upon said shaft and actuate said rods and said detent and thereby control the rotation of said carrier-shaft; all constructed and operating substantially as shown and described.

10 2. In a self-feeder and band-cutter, a crank-shaft, a feeding-fork mounted thereon and comprising a board or plate journaled upon the crank, an adjustable bar, a link pivotally

connected thereto at its rear end and pivoted near its front end to the upper end of said
15 board or plate, a fork pivoted at its upper end to the front end of said link, and a link connecting the lower end of said board or plate and said fork, substantially as described.

In testimony whereof I affix my signature 20
in the presence of two witnesses.

WILLIAM SAIGHMAN.

Witnesses:

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