

No. 725,617.

PATENTED APR. 14, 1903.

H. W. EISENHART.  
BAND CUTTER AND FEEDER FOR THRESHING MACHINES.

APPLICATION FILED JAN. 13, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

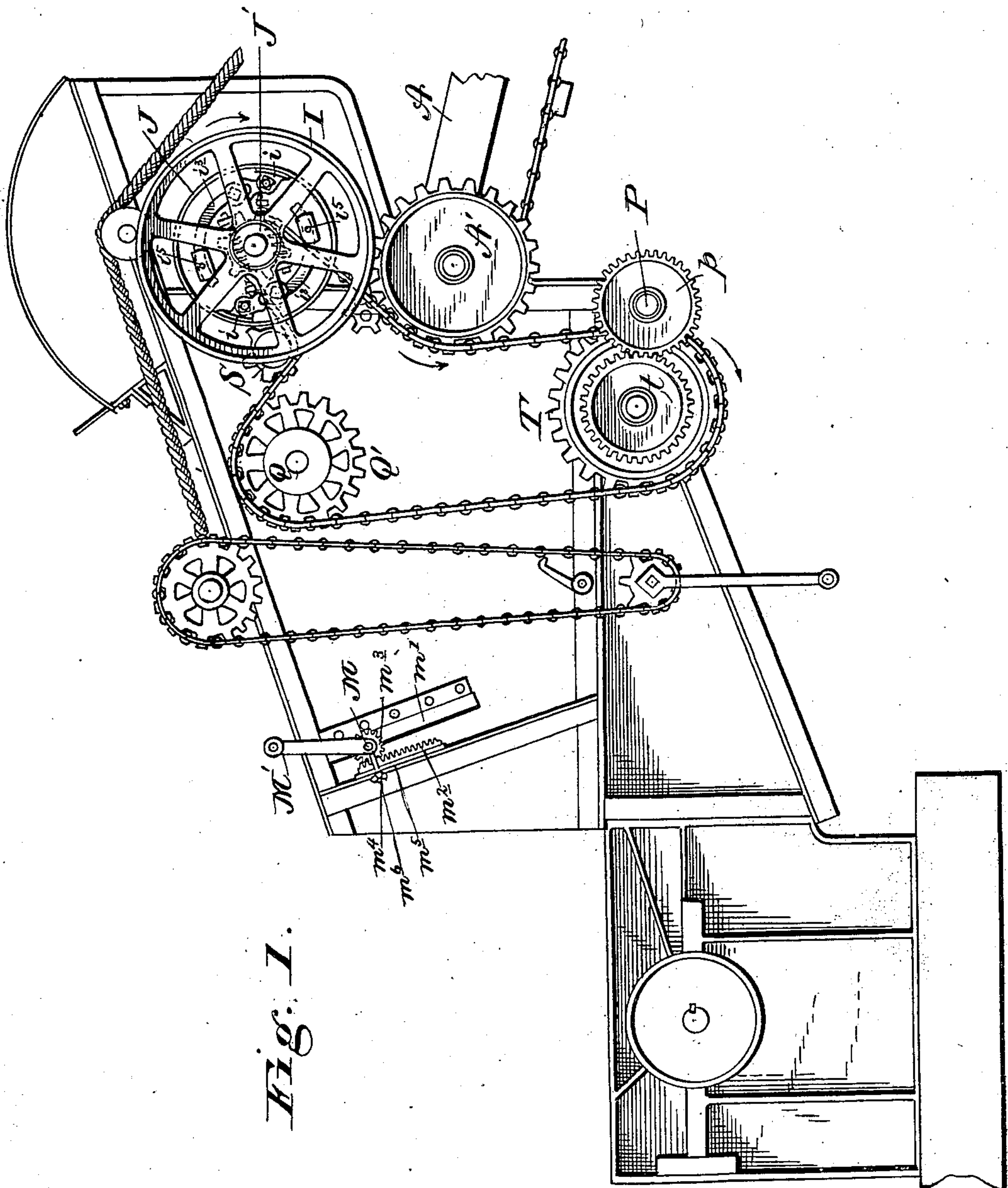


Fig. 1.

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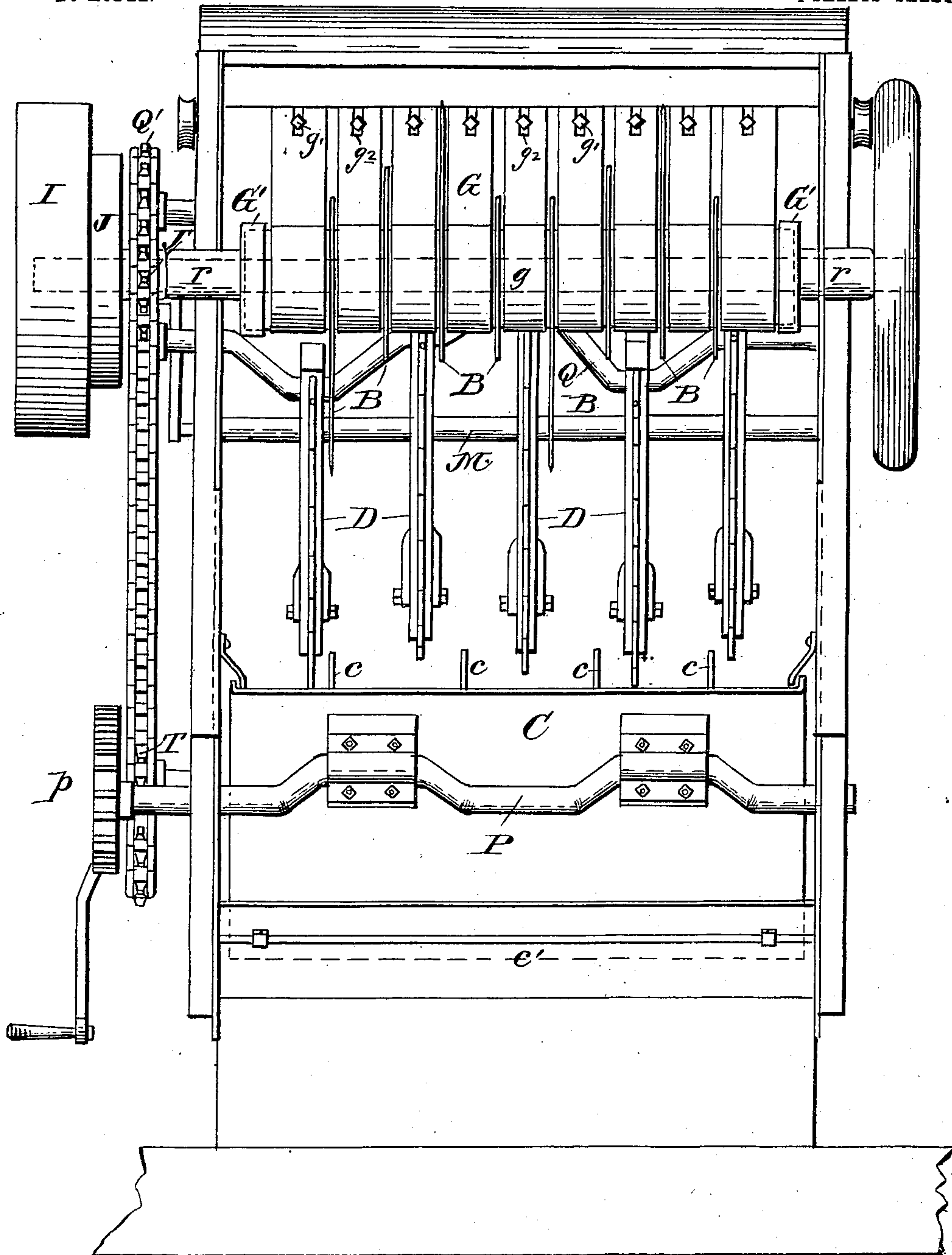
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4 SHEETS—SHEET 2.



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Fig. 2.

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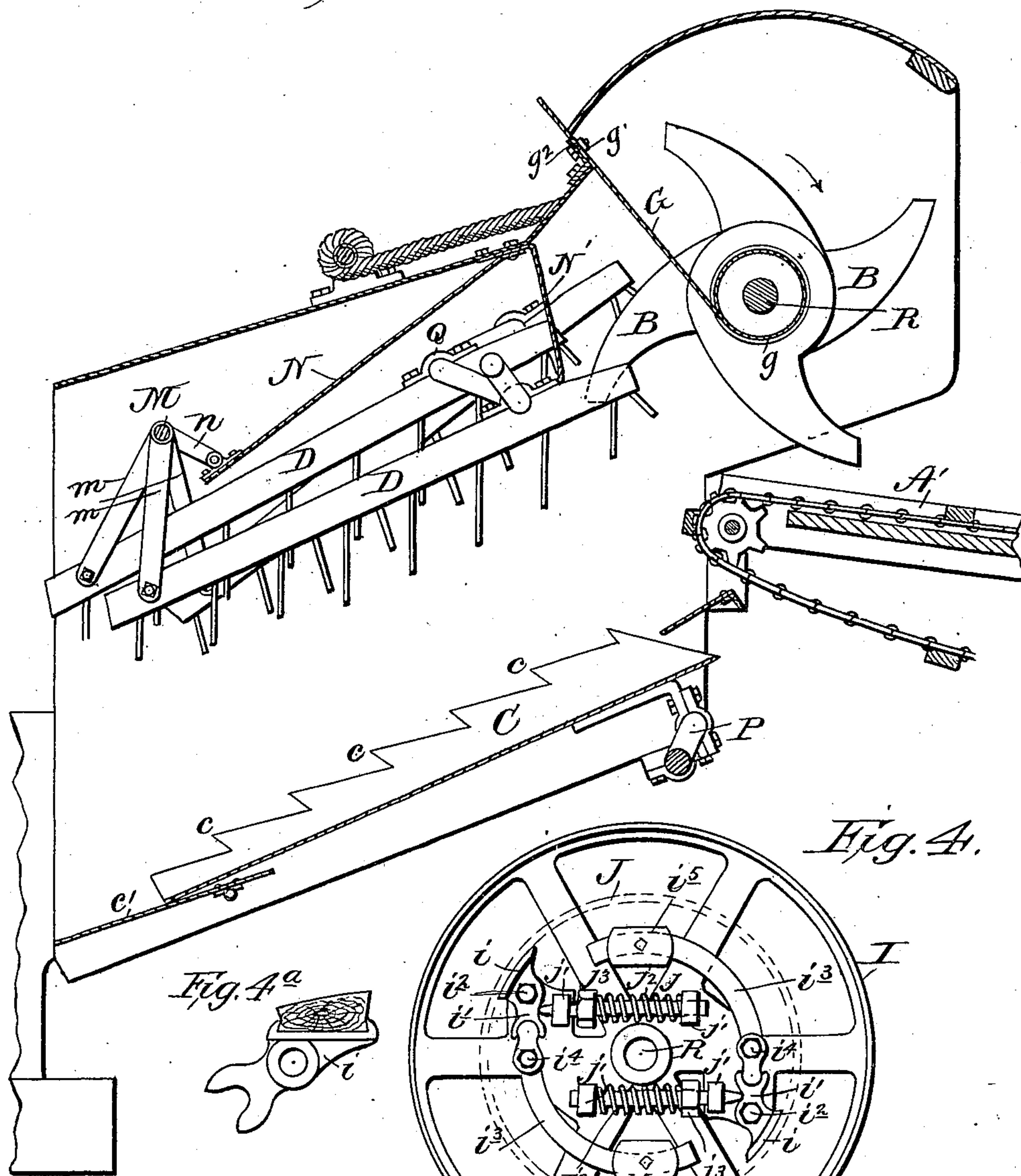
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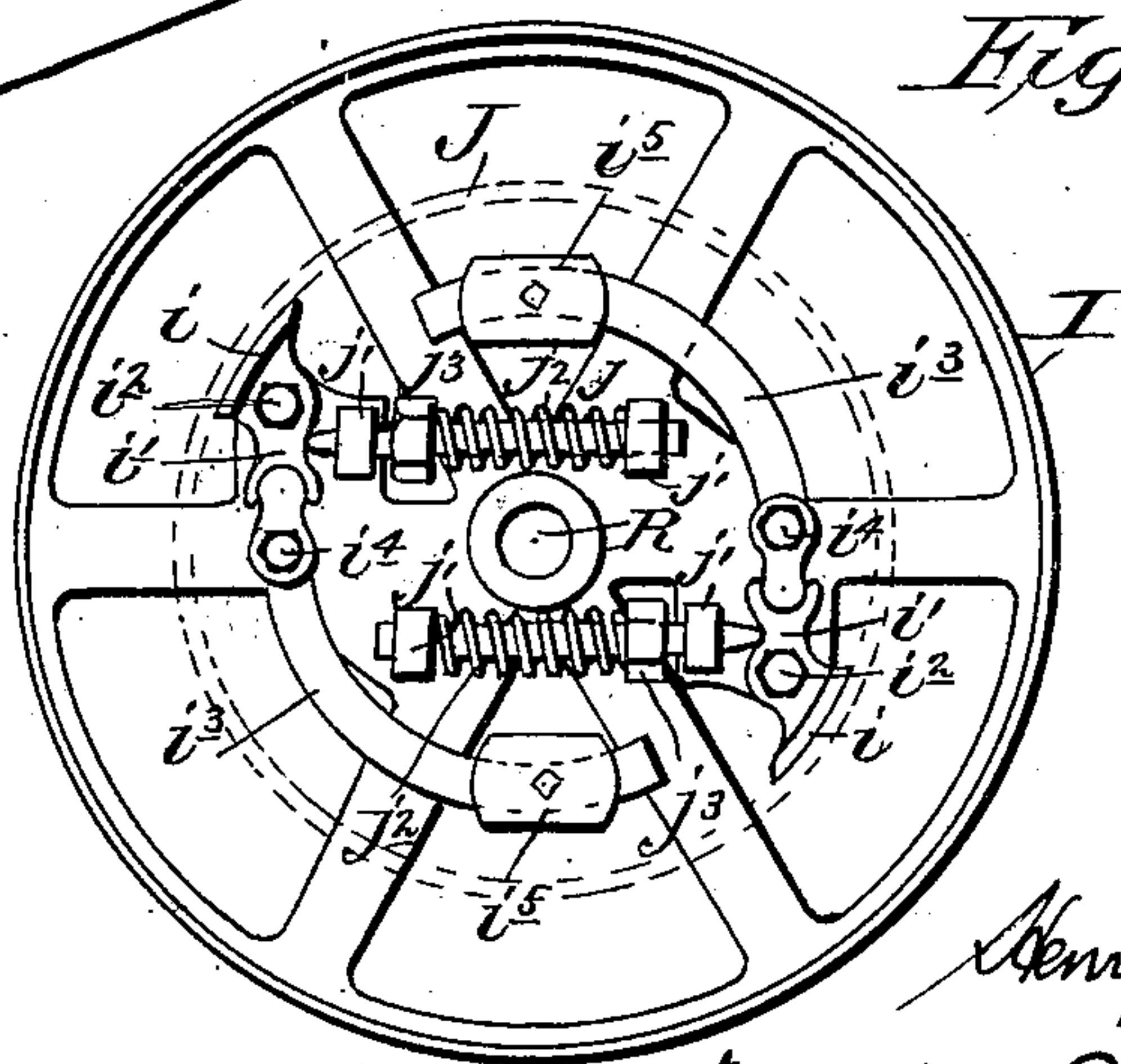
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4 SHEETS—SHEET 3.

*Fig. 3.*



*Fig. 4.*



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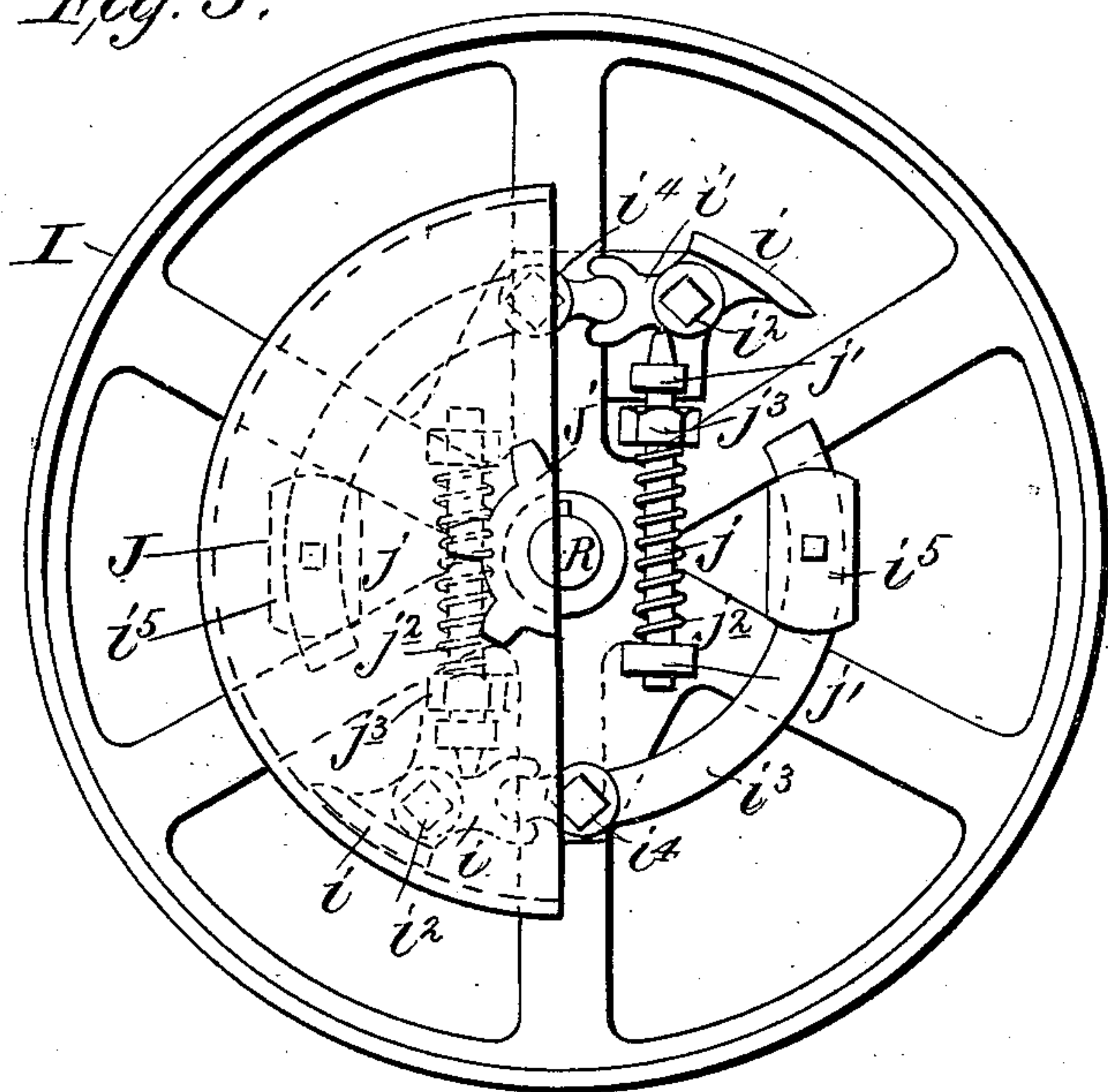
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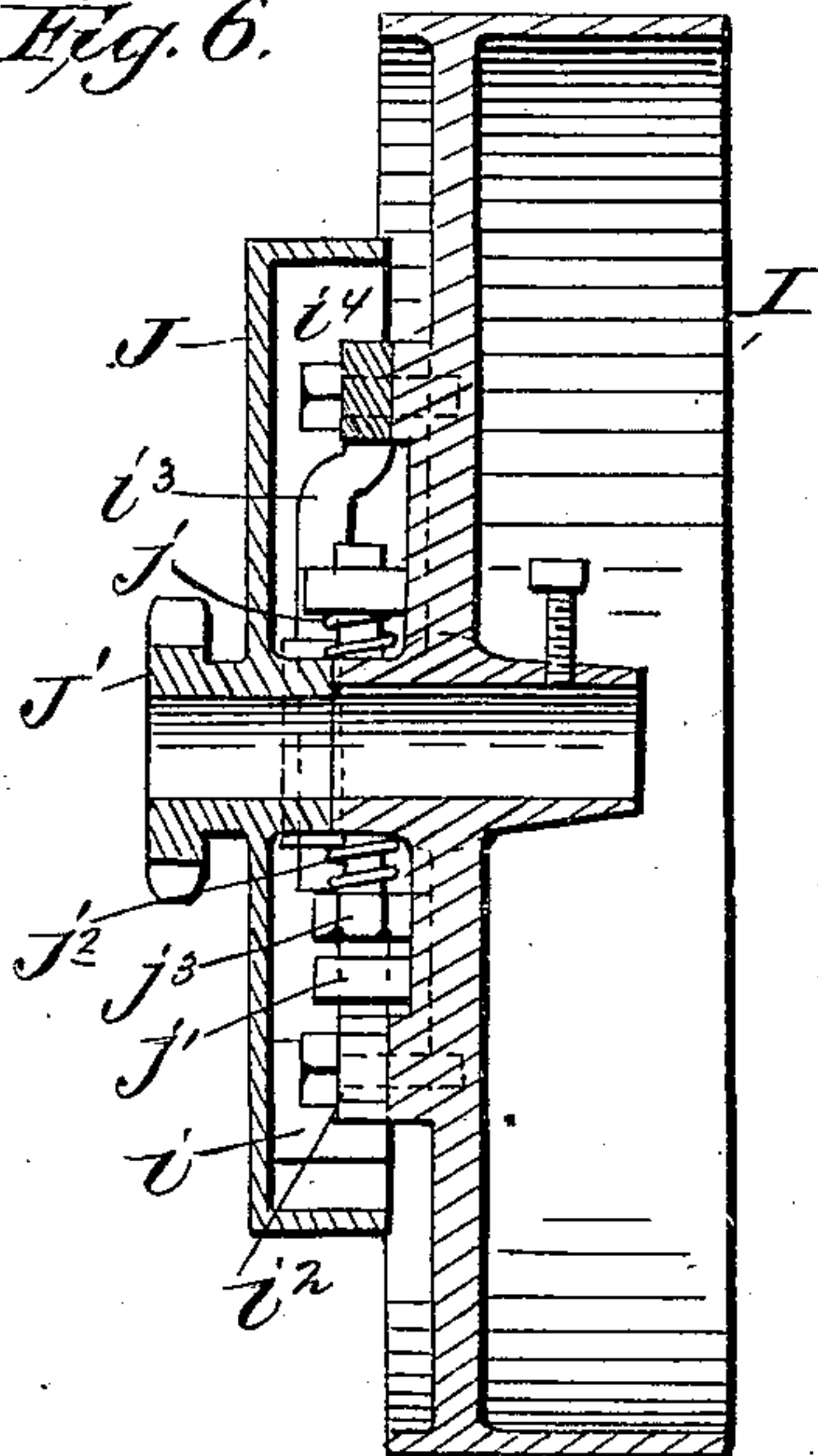
NO MODEL.

4 SHEETS—SHEET 4.

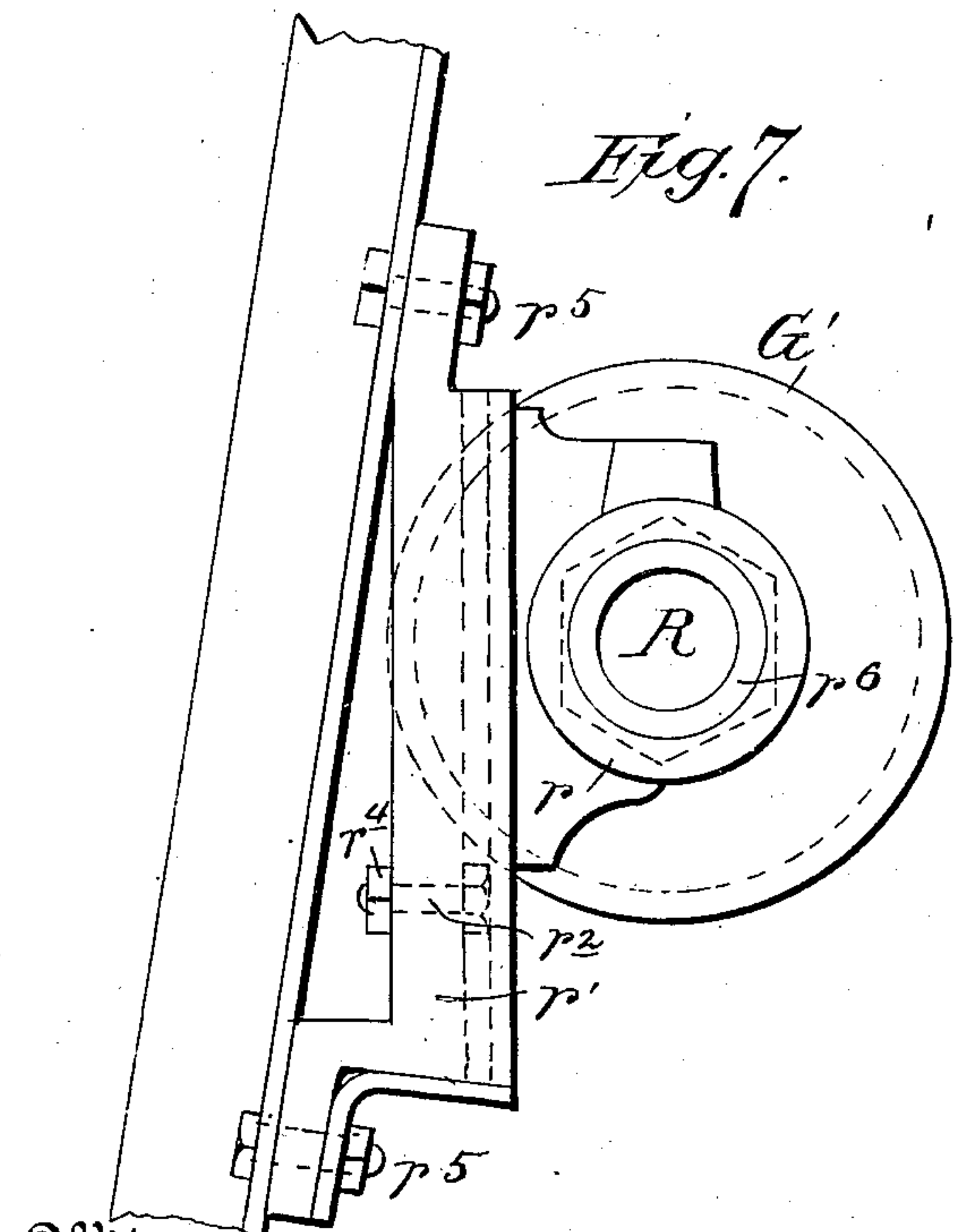
*Fig. 5.*



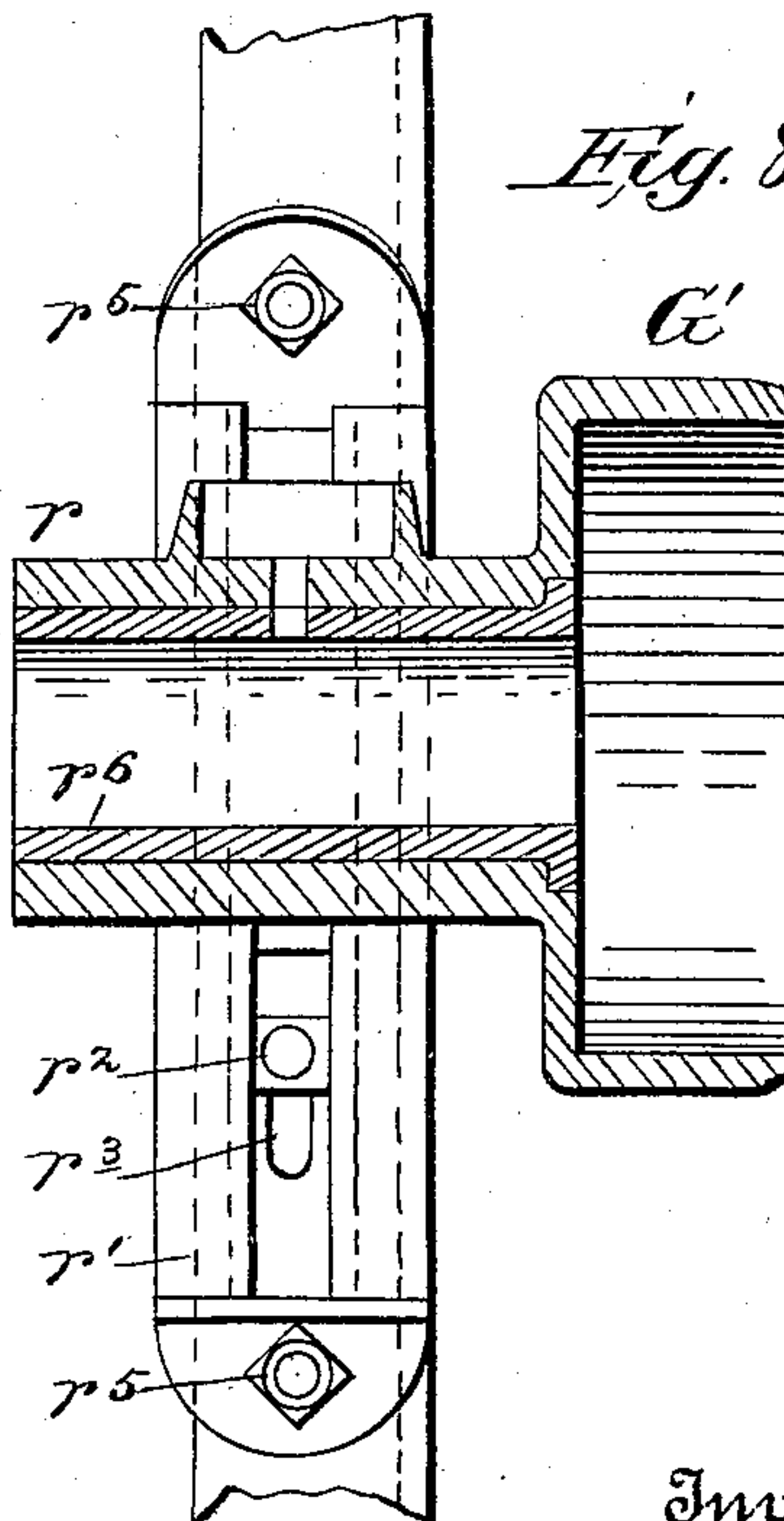
*Fig. 6.*



*Fig. 7.*



*Fig. 8.*



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# UNITED STATES PATENT OFFICE.

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## BAND-CUTTER AND FEEDER FOR THRESHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 725,617, dated April 14, 1903.

Application filed January 13, 1903. Serial No. 138,853. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY W. EISENHART, a citizen of the United States, residing in the city of York, Pennsylvania, have invented certain new and useful Improvements in Band-Cutters and Feeders for Threshing-Machines, of which the following is a specification.

This invention relates to the band-cutting and feeding devices of threshing-machines; and it consists of certain improvements which will first be described in connection with the accompanying drawings and will then be pointed out more particularly in the claims.

In the drawings, Figure 1 is a side elevation of so much of a threshing-machine as needed to illustrate the improvements. Fig. 2 is an enlarged end elevation of the same with the endless-chain carrier removed. Fig. 3 is a longitudinal vertical central section through the band-cutter and feeder. Fig. 4 is a view of that face of the band wheel or pulley on which the governor is mounted. Fig. 4<sup>a</sup> is an enlarged view of one of the friction-clutch shoe-levers, showing the preferred construction of the shoe *i*, consisting of a block of wood held in dovetailed ways formed in the shoe end of the shoe-lever. Fig. 5 is a view similar to Fig. 4, but enlarged, and also showing one-half of the clutch-disk with which the shoe-levers on the band-wheel cooperate. Fig. 6 is a transverse vertical axial section of the parts shown in Fig. 5. Fig. 7 is an enlarged side elevation of one of the bearings for the band-cutter shaft. Fig. 8 is a vertical cross-section of the same axially through the bearing.

A is the ordinary endless-chain carrier, which carries the bundles up to the feeding devices proper.

B represents the revolving band-cutting knives.

C is the back-and-forth and up-and-down oscillatory feed-bottom, armed with longitudinal rows of teeth *c* to assist in the distribution. It rests at its inner lower end on the stationary bottom board *c'*, and at its outer end it is mounted upon the cranks of a power-driven crank-shaft P, supported in suitable bearings in the frame of the machine and act-

ing by its rotation to give to the feed-bottom its oscillatory movement.

D represents back-and-forth and up-and-down oscillatory rakes, which at their outer ends are mounted upon the cranks of their actuating crank-shaft Q, supported in suitable bearings in the frame of the machine, and at their inner ends are hung from and supported by a cross-shaft M through the medium of links *m*, which at their lower ends are joined to the rakes and at their upper ends are sleeved loosely upon the shaft M. These rakes tear up and scatter the sheaves or bundles and deliver the same regularly to the cylinder. The bottom C aids in the distribution and feed. It is desirable that the rakes at their inner ends or ends next to the cylinder should be adjustable up and down, so as to vary the feed-passage according to the nature of the grain and the particular circumstances of the case. To this end the shaft M is adjustable up and down, for which purpose its ends project on each side of the feeder in vertical slots *m'* in the latter, each slot being bordered externally by a stationary rack *m*<sup>2</sup>, extending along one edge of the slot and adapted to be engaged by a pinion *m*<sup>3</sup>, fast on the shaft M. By rotating the shaft by means of a winch or handle M' on one of its ends it can be raised or lowered, as desired. It is held in adjusted position by any suitable means, in this instance by an eyebolt *m*<sup>4</sup>, one on each side of the machine, the eye of the bolt encircling the end of the shaft and the screw-threaded bolt-shank passing through a vertically-slotted flange *m*<sup>5</sup> and having on its end a thumb-nut *m*<sup>6</sup>, by means of which the shaft can be drawn in a direction to jam the pinion *m*<sup>3</sup> tightly into the rack *m*<sup>2</sup>.

Above the rakes is arranged a fender or cover N, preferably of sheet-iron, to prevent the straw from being carried up over the rakes. It extends lengthwise of the feed-chamber and is attached at its outer end to the top of the feed-box and at its inner end is connected to the shaft M by hanging-links *n*, swiveled to the shaft and the fender, respectively, thus permitting the fender at its inner end to move up and down with the shaft. At the outer end of the feed-chamber



is a stationary vertical hood or curtain  $N'$ , which is also intended to prevent any straw from passing in above the rakes, this curtain being slotted to permit the passage of the  
5 rakes.

The several moving parts of the feeder are driven from the band-cutter shaft  $R$ , which in turn is driven, as customary, by belting from the thrasher-cylinder. In order that the  
10 knives  $B$  may be set nearer to or farther from the sheaves or bundles which they are to act on, the shaft  $R$  is made adjustable up and down, for which purpose it is mounted in bearings  $r$ , which are held in stationary vertical  
15 guideways  $r'$ , in which they can move up and down. The guideways  $r'$ , as seen more clearly in Figs. 7 and 8, which show one of the guideways with the bearing  $r$  therein, are attached to the front or outer face of the feed-box, and  
20 in each guideway the bearing is held in adjusted position therein by means of a bolt  $r^2$  on the bearing, which passes through a slot  $r^3$  in the back of the guideway and has on its projecting end a tightening-nut  $r^4$ .

It is quite necessary to provide some means of preventing straw from wrapping and winding around the cutter-shaft and the hubs of the knives fastened thereon, a thing which is likely to happen at all times, but particularly  
30 when the grain is wet and heavy. To this end I employ the guards  $G$ , interposed between the knives and forming an effective barrier to the backward passage of the straw. The guards are preferably made of thin sheet-  
35 steel of a width to fill the spaces between the knives. They are bent at their lower ends to form sleeves  $g$ , loosely encircling the hubs of the knives, and extend straight up from the side of the cutter-shaft next to the feed-  
40 rakes to the top of the feed-chamber above, where they are secured by bolts and nuts  $g'$ . In order that these guards may be adjusted up and down with the shaft  $R$ , the bolts  $g'$  pass through longitudinal slots  $g^2$  in the  
45 guards. Whenever it is desired to adjust the shaft  $R$ , the nuts of the retaining-bolts  $g'$  of the guards are loosened, and then when the shaft is moved up and down the guards will move with it. In order to prevent straw from  
50 wrapping on the end hubs on the cutter-shaft, I form on the inner ends of the bearings  $r$  of the band-cutter shaft annular guards  $G'$ , in which the end hubs on the cutter-shaft are completely housed and protected. Each bear-  
55 ing  $r$  is lined with a removable and replaceable bushing  $r^6$ , of brass or Babbitt metal, to take the wear.

It has before been proposed in this class of machines to connect the driving-shaft of the  
60 feeder with the shaft of the threshing-cylinder through the medium of motion-transmitting mechanism controlled by a friction-clutch governor in such manner that the feeder shall not begin to move until the  
65 threshing-cylinder has reached a predeter-

mined speed of rotation. I have devised for this purpose a compact and efficient mechanism, which will now be described.

I is a band wheel or pulley fast on the band-cutter shaft  $R$ , driven by belting from the  
70 thrasher-cylinder, as usual. Adjoining the band-wheel and loose upon the band-cutter shaft is the one member of the friction-clutch, consisting in this instance of a clutch-disk  $J$ , with an annular flange or rim projecting lat-  
75 erally from the side of the disk next to the band-wheel  $I$ . Mounted on the contiguous face of the web or spokes of the band-wheel  $I$  is the other member of the friction-clutch and the governor for controlling the same. 80  
The member of the friction-clutch which is carried by the band-wheel consists of the two shoes  $i$  on the ends of the levers  $i'$ , pivoted at  $i^2$  to the band-wheel and having their op-  
85 posite ends engaged each by the end of a governor-lever  $i^3$ , pivoted at  $i^4$  to the band-wheel and having on its other and longer arm a weight  $i^5$ . The end of the governor-lever which engages the shoe-lever  $i'$  is mounted  
90 and fits in a correspondingly-shaped notch in the end of the shoe-lever. When the band-wheel  $I$  revolves, the tendency of the gov-  
95 ernor-levers is to swing outwardly in a direction to force the shoes  $i$  into engagement with the rim of the clutch-disk  $J$ . With the band-  
wheel and the governor-levers and shoe-levers thus mounted thereon I combine ad-  
justably spring-controlled pressers, one for each shoe-lever, designed to hold the shoe-le-  
100 vers with their shoes out of engagement with the band-wheel so long as the threshing-cylinder is at rest or, if in motion, has not the predetermined speed of rotation. The char-  
acteristic of these adjustably spring-controlled pressers (which are separate and dis-  
105 tinct devices from both the shoe-levers and the governor-levers) is that they bear directly upon and are movable in a right line to and from their respective shoe-levers. In  
this way I am enabled to secure very effi-  
110 cient action, while the mechanical devices themselves may be simple and free from complication. The preferred embodiment of this feature of my improvement is illustrated in the drawings and may be described as follows: 115  
Upon the ends of the shoe-levers  $i'$  which are engaged by the governor-levers bear spring-pressed stems  $j$ , which tend to move from the shoe-levers in a direction to hold their shoes  $i$   
120 out of engagement with the rim of the clutch-disk. Each stem is mounted in bearings  $j' j''$ , in which it can move lengthwise. It is pressed by a spring  $j^3$  in a direction to cause it to bear upon its shoe-lever, and the spring-pressure  
125 can be regulated by a nut  $j^3$  on a screw-threaded portion of the stem. The springs serve to take up the lost motion and are so adjusted as to cause the stems  $j$  to hold the shoes  $i$  out of engagement with the clutch-disk  $J$  until  
130 the band-wheel  $I$  has attained a predeter-



mined speed of rotation. Upon the hub of the clutch-disk J is a sprocket-wheel J', from which motion is communicated to the other parts of the feeder through an endless sprocket-chain engaging the sprocket-wheel A' on the front axle or shaft of the carrier A, the sprocket-wheel Q' on the rake-shaft Q, and the intermediary sprocket-wheels S T, the latter being provided with a spur-wheel t, which engages a like wheel p on the actuating-shaft P of the oscillatory bottom C. The direction of revolution of the parts just referred to is indicated by arrows.

The feeder and band-cutter thus constructed is thoroughly effective and at the same time is very compact and occupies but little space. The feeding devices distribute and deliver the grain with great regularity, far more regularly, indeed, than any hand-feeder. It will be noted that each rake is mounted independently of its fellows and that their actuating-cranks are set at angles to one another, so that the rakes rise and fall successively and not in unison, and the stationary guards encircling the band-cutter shaft and extending up to a support at the top of the feeder are an absolute barrier to the wrapping of the grain around the shaft.

Having described my improvements and the best way now known to me of carrying the same into practical effect, what I claim herein as new, and desire to secure by Letters Patent, is as follows:

1. In a feeder for threshing-machines the combination with the feed-chamber and bottom therein over which the grain passes, of up-and-down and to-and-fro oscillatory rakes, and a fender located above the rakes and extending lengthwise of the feed-chamber, substantially as and for the purposes hereinbefore set forth.

2. The combination with the feed-chamber and bottom therein over which the grain passes, of up-and-down and to-and-fro oscillatory rakes located above the bottom, and means for simultaneously adjusting the inner ends of all the rakes to different distances from the said bottom, substantially as and for the purposes hereinbefore set forth.

3. The combination with the feed-chamber, the feed-rakes and the crank-shaft on which their outer ends are mounted, of a cross shaft or bar, vertically adjustable in the feed-chamber, means for adjusting said shaft and for holding it in adjusted position, and links swiveled at one end to the cross-bar, and at the other end to the inner ends of the rakes, substantially as hereinbefore set forth.

4. The combination with the feed-chamber, the up-and-down and to-and-fro oscillatory rakes, and a support for the inner ends of said rakes vertically adjustable in the chamber, of a fender above the rakes, having its inner end connected to, and adjustable with,

the said rake-support, substantially as hereinbefore set forth.

5. The combination with the band-cutter shaft and the knives thereon, of stationary guard-plates interposed between the knives, sleeved upon the band-cutter shaft and thence extending up, and secured at their upper ends to a support in the frame of the machine, substantially as hereinbefore set forth.

6. The combination with the band-cutter shaft, and bearings therefor vertically adjustable in their supporting-frame, of stationary guard-plates interposed between the knives on said shaft, sleeved upon the band-cutter shaft and thence extending up to a support above, and means for adjustably securing the guards to said support, so as to permit the guards to be vertically adjusted along with the band-cutter shaft, substantially as hereinbefore set forth.

7. The combination with the band wheel or pulley, the clutch-disks and the shaft upon which the same are mounted, of the shoe-levers pivoted to the band-wheel and provided with shoes to engage the clutch-disk, weighted governor-levers pivoted to the band-wheel and engaging the shoe-levers, and adjustably spring-controlled pressers one for each shoe-lever, mounted upon the band-wheel and movable in a right line to and from, and directly bearing upon, their respective shoe-levers, substantially as and for the purposes hereinbefore set forth.

8. In combination with the band-cutter shaft and the band wheel or pulley thereon, a clutch-disk mounted loosely on said shaft and provided with a peripheral flange or rim laterally projecting toward the band-wheel, shoe-levers pivoted to the band-wheel, and provided with shoes which are adapted to bear against the inner face of the rim on the clutch-disk, weighted governor-levers pivoted to the band-wheel and engaging the shoe-levers, stems or rods j bearing on the ends of the shoe-levers engaged by the governor-levers, bearings j' on the band-wheel in which said rods j are mounted and lengthwise movable, springs j<sup>2</sup> for acting on said rods or stems, and nuts j<sup>3</sup> for adjusting the pressure of said springs, substantially as and for the purposes hereinbefore set forth.

9. The combination with the band-cutter shaft and the cutters with the hubs on said shaft, of bearings therefor having annular guards in which the end hubs on the cutter-shaft are received and housed, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my hand this 5th day of January, 1903.

HENRY W. EISENHART.

Witnesses:

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