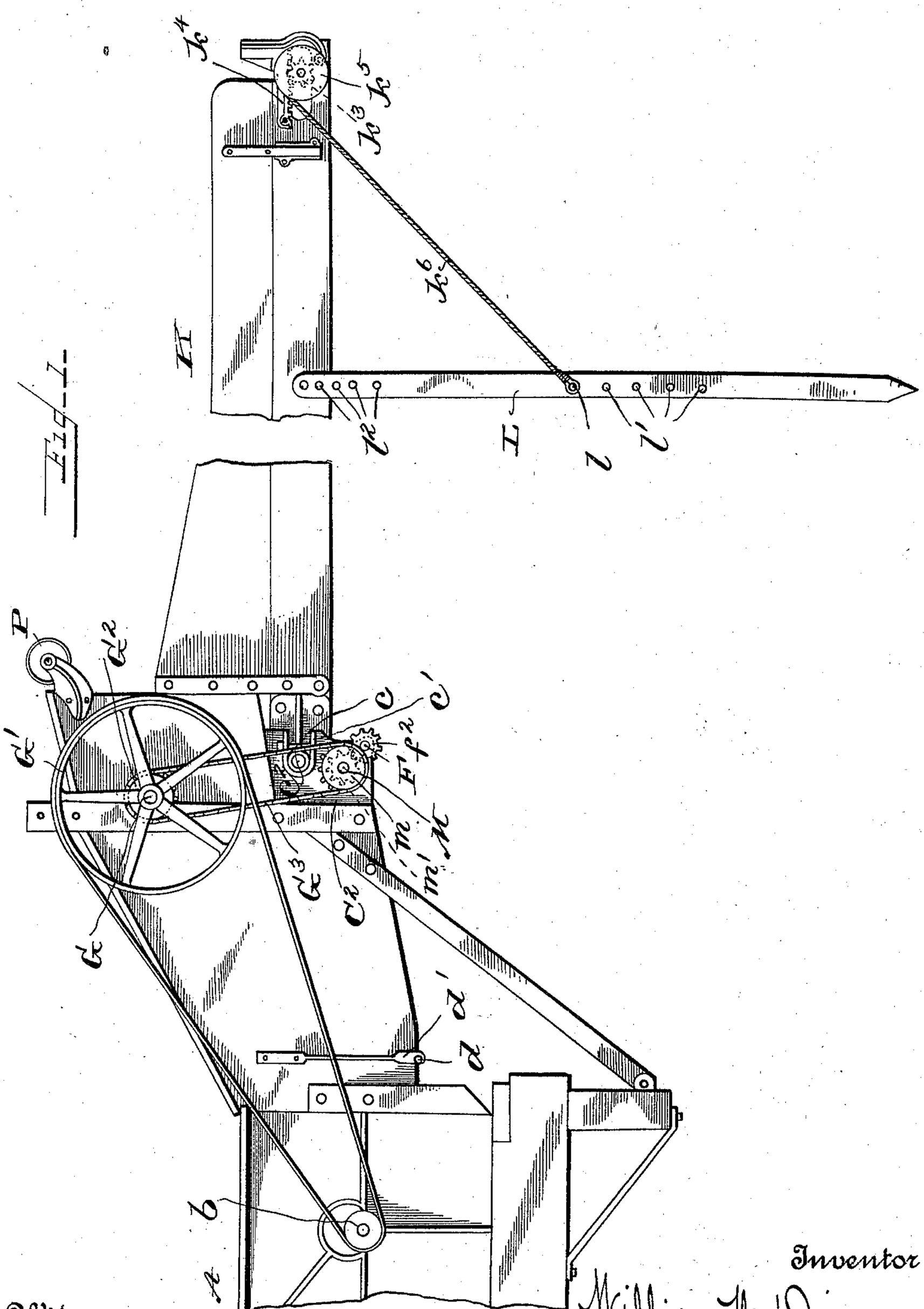
(No Model.)

4 Sheets—Sheet 1.

W. W. DINGEE.

BAND CUTTER AND FEEDER.

No. 558,873. Patented Apr. 21, 1896.



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(No Model.) 4 Sheets—Sheet 2.

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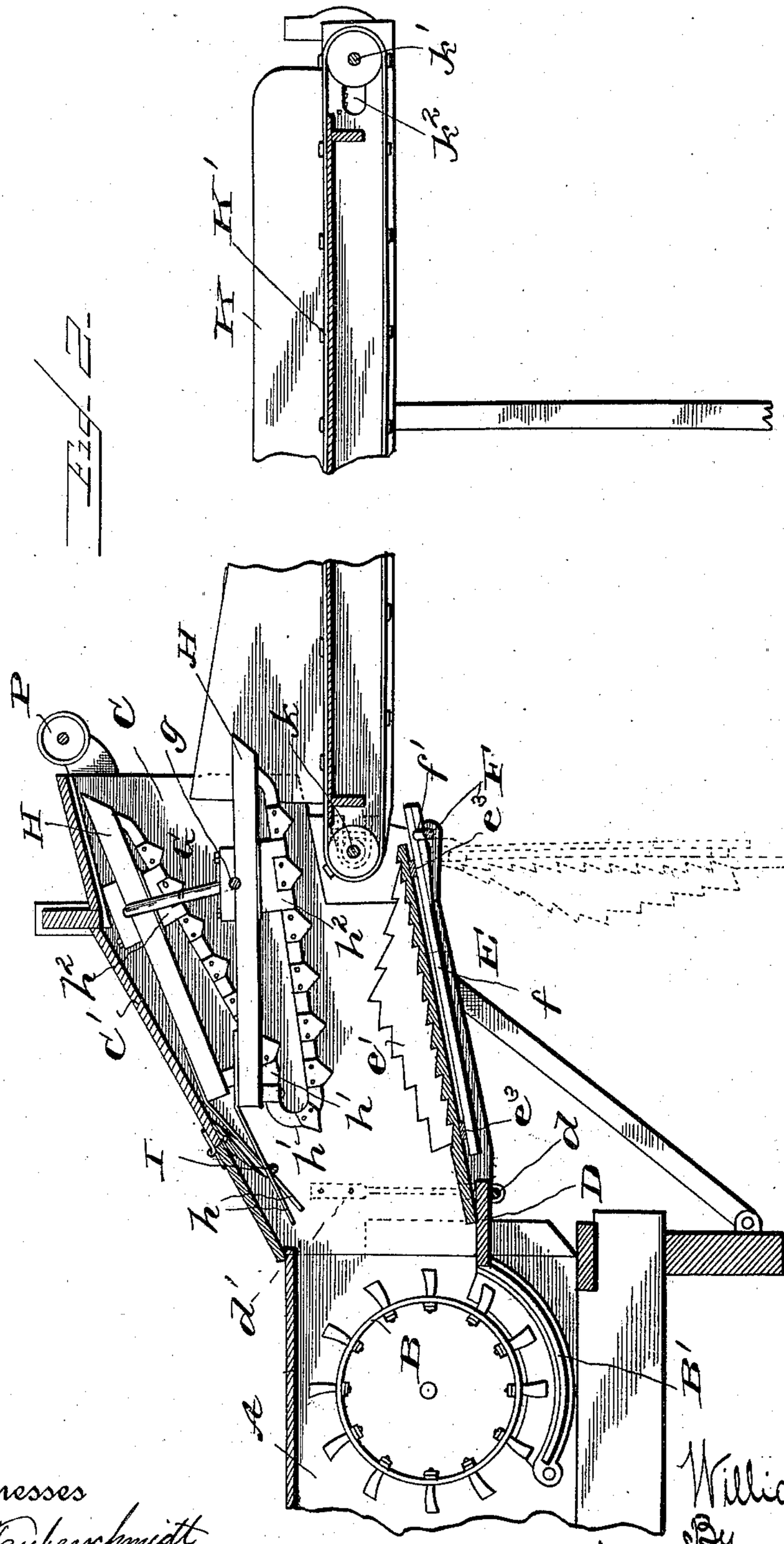

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BAND CUTTER AND FEEDER.

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Fig. 3

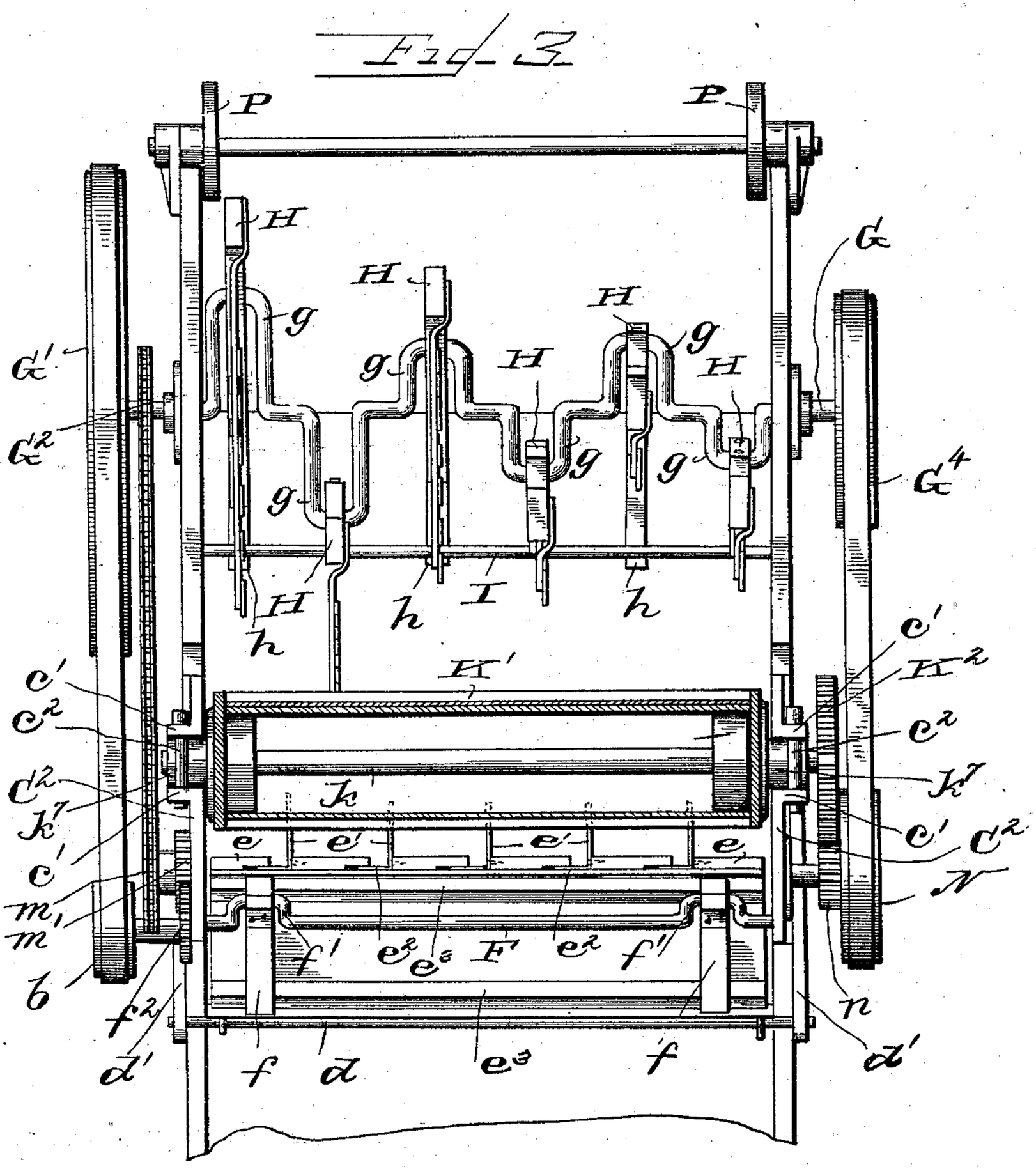
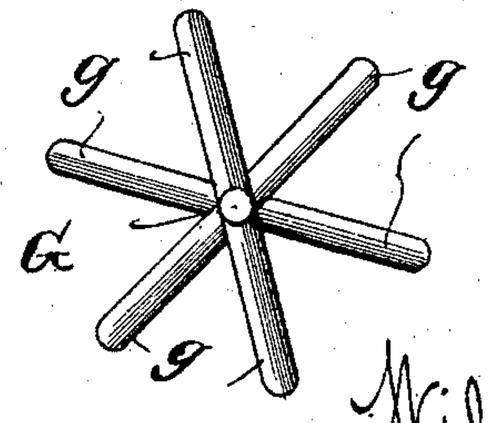


Fig. 4



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(No Model.) 4 Sheets—Sheet 4.

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Fig. 5.

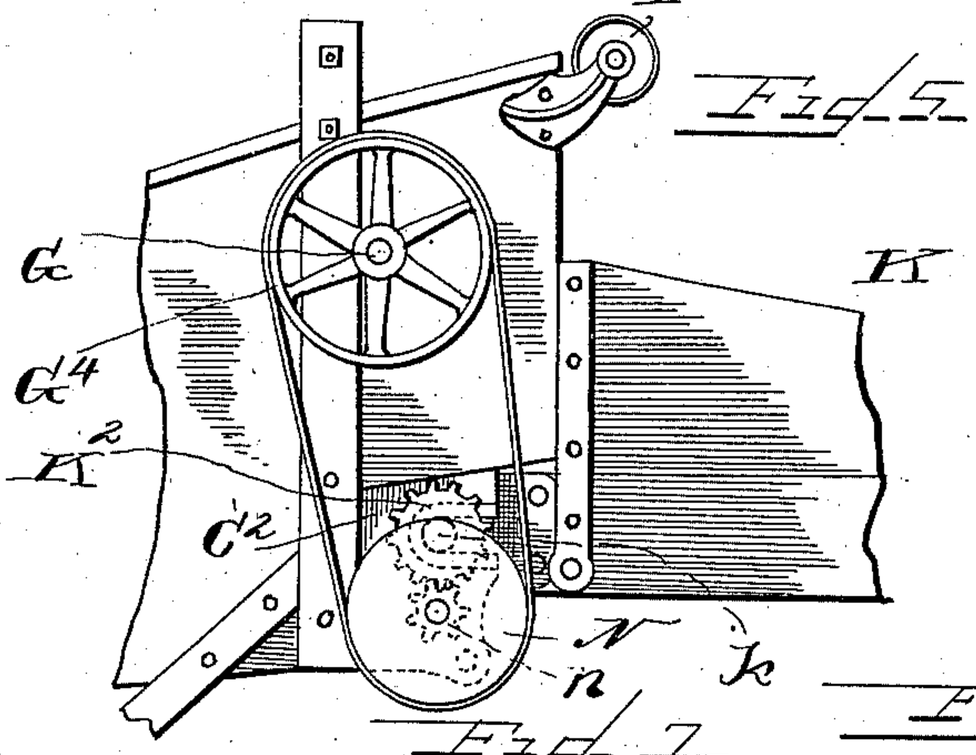


Fig. 6.

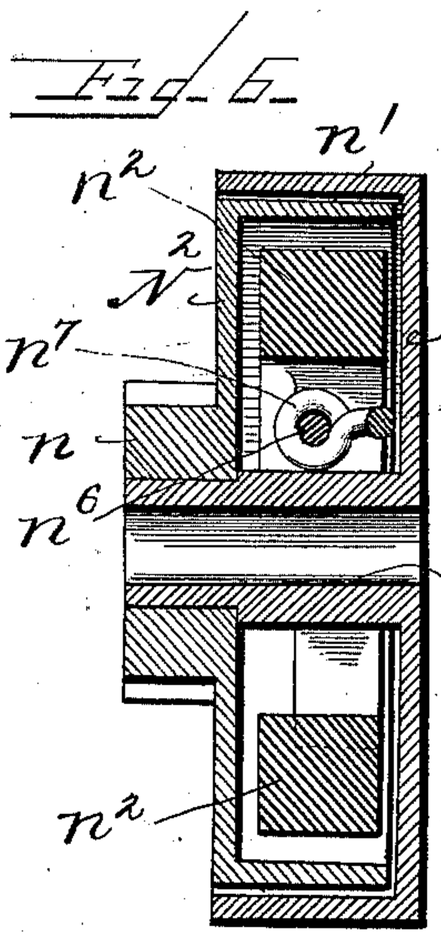


Fig. 7.

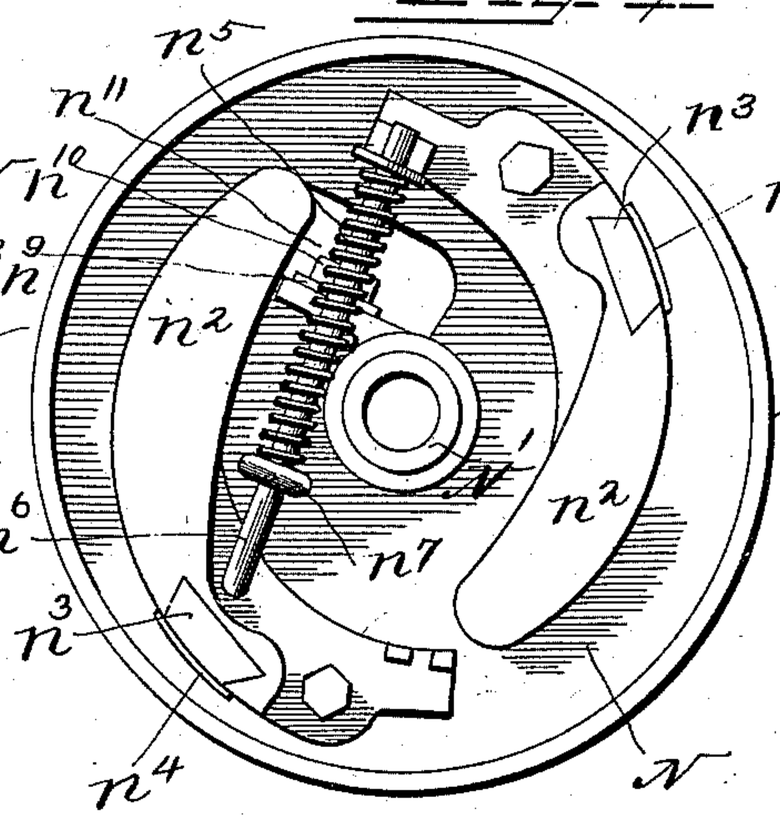


Fig. 8.

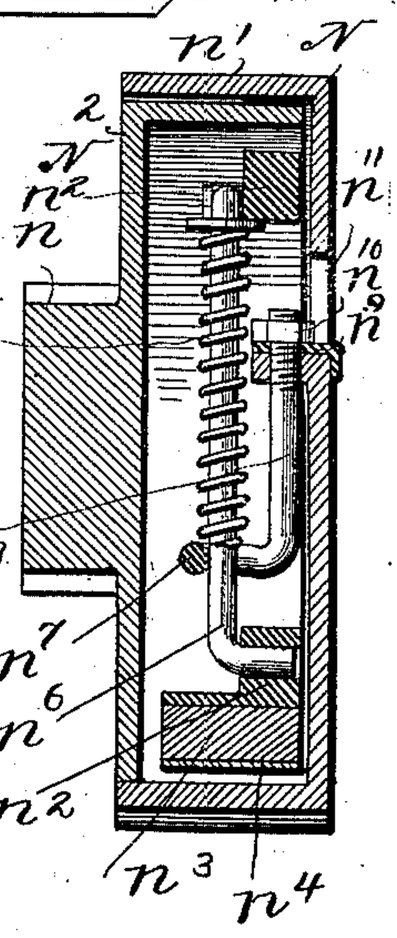
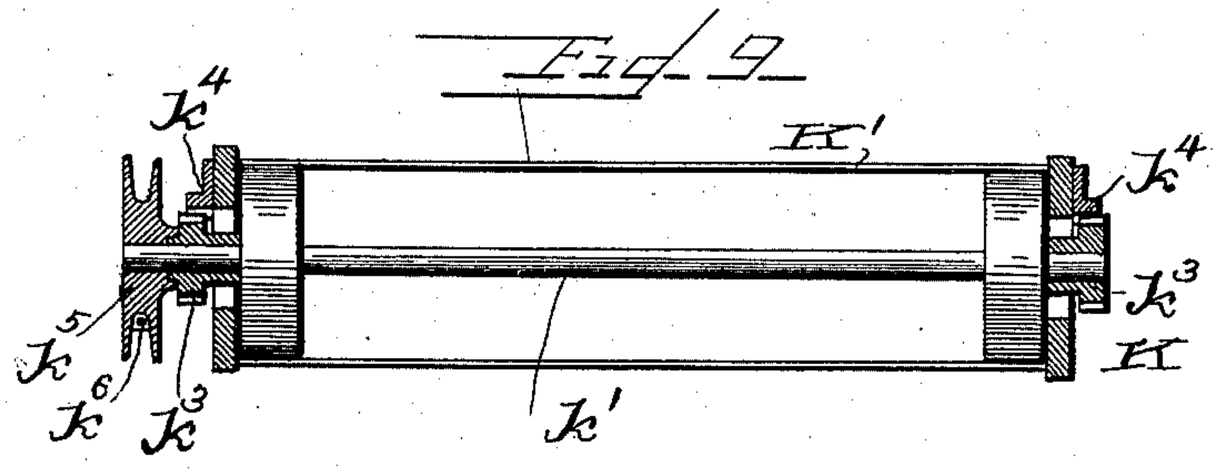


Fig. 9.



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UNITED STATES PATENT OFFICE.

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BAND-CUTTER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 558,873, dated April 21, 1896.

Application filed June 18, 1895. Serial No. 553,223. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. DINGEE, a citizen of the United States, residing at Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Band-Cutters and Feeders; 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 consists in the novel features hereinafter described, reference being had to the accompanying drawings, which illustrate one form in which I have contemplated embodying it, and said invention is fully disclosed in the following description and claims.

Referring to the said drawings, Figure 1 represents a side elevation of my improved band-cutter and feeder. Fig. 2 represents a longitudinal sectional view of the same. Fig. 3 represents a rear elevation of the device, showing the feeding-conveyer in section. Fig. 4 is a detail end view of the crank which drives the cutting-bars. Fig. 5 represents an elevation of the central portion of the device from the side opposite that shown in Fig. 1. Figs. 6, 7, and 8 are detail views of the automatic governor for the feeding-conveyer. Fig. 9 represents a section through the outer end of the said conveyer.

In the drawings, A represents the cylinder-casing of a thrashing-machine to which my improved band-cutter and feeder is attached, and B represents the cylinder thereof.

C represents the hood or casing of the band-cutter mechanism proper, which is preferably permanently attached to the machine, although it may be removed when desired and may be adapted to be attached to any ordinary thrashing-machine.

D is a removable bottom board, which has one end supported adjacent to, and in this instance by, the concave B′ and has its other edge provided with a supporting-rod *d*, the projecting ends of which are engaged by spring-hangers *d′*, secured to the exterior of the casing C and provided with notches for engaging said rod.

E represents the movable hopper-bottom which forms the bottom of the casing C. I prefer to form this bottom of a series of slats *e*, preferably of wood, between which are a series of vertically-disposed saws or notched blades *e′*. The saws *e′* are each provided along their lower edge with a horizontal flange e^2, (see Fig. 3,) which extends laterally away from the slat *e*, to which the saw is attached, and engages a recessed portion on the under side of the next adjacent slat. It will thus be seen that these flanges e^2 will cover the spaces between adjacent slats, thus allowing said slats to shrink or swell without leaving openings through which grain would otherwise fall. The slats *e* are secured together by transversely-extending cleats e^3, (see Fig. 2,) to which are secured pitmen *f*, engaging cranks *f′* on a shaft F, extending transversely of the casing C and operated, as hereinafter described, for the purpose of imparting a circular movement to the rear end of the hopper-bottom. The rear ends of the slats *e*, forming the hopper-bottom, have a sliding engagement with and are supported by the removable bottom board D. As the shaft F forms the support for the front end of the hopper-bottom E, it is obvious that by removing the bottom board D, by springing the hangers *d′* out of engagement with the rod *d*, the hopper-bottom may be lowered into the position shown in dotted lines in Fig. 2. This will enable an operator to stand under the casing C and have access to the cylinder B to insert new teeth or for any other purpose.

In the upper part of the casing C the crank-shaft G is mounted in suitable bearings. This shaft is provided with a series of cranks, preferably six in number, arranged at equal distances about a common center of rotation, as shown in Fig. 3 and in the end view, Fig. 4. To each of the cranks *g* is secured one end of a cutter-bar forming a part of the band-cutting mechanism. Each of these bars consists in this instance of a wooden bar H, having a bearing portion engaging a crank *g* and provided at its rear end with a downwardly-inclined rod or bar *h*, which engages a supporting-rod I, extending transversely of the casing C and supported by the side walls thereof. To the wooden bar H is secured a metal bar *h′*, having its ends secured to the bar H and braced centrally by a combined

spacing-block and guide h^2, which engages the bar h' intermediate its ends to prevent the vibration or bending of the same. To the bar h' are secured a series of knives, preferably formed like the sections of a mower cutter-bar and riveted or otherwise secured to the bar, so as to be readily replaced when broken. It will be seen that each of the cutter-bars will have a circular movement at one end and a sliding movement at the other end and that by reason of the number of cutting knives or sections and the placing of the cranks in the manner described the machine will operate very thoroughly and surely in cutting the bands and spreading the sheaves. The casing C is provided with a door C′ on its upper side to give access to the cutting-bars when desired.

K represents the frame of the feeding conveyer or carrier, which is constructed in the usual manner and is provided with the endless apron K′, which engages suitable rollers on a shaft k at the rear end of the frame, mounted in rigid bearings, and a shaft k' at the forward end, which is adjustable toward and from the shaft k. The sides of the carrier-frame are provided with slots k^2 at its forward end, through which the shaft k' passes, and said shaft is provided at each end with a pinion k^3, (see Figs. 1 and 9,) which engages with a rack k^4, formed on a casting secured to the frame of the carrier. Upon one end of the shaft k' is a grooved pulley k^5, rigidly keyed to the shaft and provided with an eye or other suitable means whereby one end of a rope, chain, or other flexible connection k^6 may be secured rigidly in the groove of said pulley. The rope is then given one or more winds about the pulley and its free end is provided with a loop by which it may be secured to some stationary object. In this instance I have shown one of the supporting-legs L for the carrier provided with a pin l, which can be placed in one of several adjusting-apertures l', and the end of the rope k^6 is conveniently attached to this pin. It will thus be seen that by drawing on the rope k^6 the grooved pulley k^5 can be revolved in a direction to cause the pinions k^3 to move forward with respect to the racks k^4, thus carrying the shaft k' forward and tightening the apron K′, and the desired degree of tension on the apron can be obtained by means of the pin l and the apertures l' just described. If for any reason it should be desired to stop the movement of the carrier-apron, it is simply necessary to disengage the rope k^6 from the pin l, when the weight of the carrier-apron will cause the shaft k' to move rearwardly, thus slacking the apron, so that it will not be operated by the driving-shaft k. It will be understood that the apron-supporting rollers on the shaft k will turn with the shaft and those upon the shaft k' loosely thereon.

The carrier K is adapted to be removably secured in relation to the casing C, and to this end the said casing is provided near its lower edge with a metal plate or casting C^2, which is provided with an open slot or recess c, having a laterally-extending flange c' surrounding the same, there being one of these plates on each side of the machine. The slots $c\ c$ are of a size adapted to receive collars k^7 k^7, forming the bearings for the apron-driving shaft k, and after said collars are placed in engagement with said recesses pins $c^2\ c^2$ are passed downward through apertures in the flanges c' in front of said collars, thereby retaining the rear end of the carrier in engagement with the casing C, as clearly shown in Figs. 1 and 3. The carrier K is supported intermediate its ends by the legs L, which are preferably pivotally secured to the carrier, the said legs being provided with a series of holes l^2 for adjusting the height at which the carrier is to be supported when desired.

The crank-shaft G is provided in this instance on the right side of the machine (shown in Fig. 1) with a large band-cutter G′, which receives power from a small pulley b on the cylinder-shaft. On the shaft G is a sprocket-wheel G^2, engaged by a sprocket-chain G^3, which also passes over a sprocket-wheel M on a stud m, secured to the plate C^2. A pinion m' is formed integrally with the sprocket M and engages a similar pinion f^2 on the shaft F, thereby imparting motion to the movable hopper-bottom E. On the opposite side of the machine the crank-shaft G is provided with a band-wheel G^4, which is engaged by a belt passing over a governor N, mounted on a stud secured to the plate C^2 and having a pinion n connected therewith, which pinion meshes with a gear K^2 on the driving-shaft k of the carrier-apron. It will thus be seen that the governor directly controls the carrier-apron and no other part of the machine, and by this means the choking of the machine will be prevented, as hereinafter described.

The governor N includes among its members the following elements: N′ represents a sleeve for engaging the stud which supports the governor, the said sleeve being provided with a disk N, provided with a peripheral flange. N^2 represents a similar disk provided with a peripheral flange n', the inner face of which is turned accurately, so as to form a friction-surface. The disk N^2 is provided with the pinion n, preferably formed integrally therewith and forming the hub of the disk, which turns upon a reduced portion of the sleeve N′. To the disk N of the governor are pivotally secured a pair of weighted arms n^2, which are provided adjacent to their points of pivoting with removable friction-blocks n^3, which are driven into dovetailed recesses in said weighted arms, and said friction-blocks are further provided with a friction-surface of leather, rubber, or other suitable material, which is secured to the removable friction-block in any desired way. I prefer to form these blocks of wood, as they can be renewed when necessary and the friction-covering can be tacked, glued, nailed, or otherwise secured

to the wooden block more conveniently than it could be attached to metal parts.

The weighted arms n^2 are held in their inmost position by means of a coiled spring n^5, which surrounds a guide-rod n^6, pivotally engaging said weighted arms and connecting the same for joint movement. The spring n^5 engages one of said arms at one end and at the other end an eye n^7, through which the guide-rod n^6 passes, the said eye forming a part of an adjusting-rod n^8, the end of which passes through a perforated lug n^9, formed integrally with the disk N, and is provided with an adjusting-nut n^{10}. The disk N is provided with a recess or aperture n^{11} adjacent to the adjusting-nut n^{10}, so as to allow it to be turned from the outer side of said disk. By reference to Figs. 6, 7, and 8 the construction of this governor will be apparent and it will be seen that when the disk N is rotated at a slow speed by means of a belt from the pulley G^4, as shown in Figs. 3 and 5, the weighted arms will remain in their inner positions and the friction-surfaces will not engage the friction-flange n' of the disk N^2, so that the pinion n will not be rotated and no motion will be imparted to the carrier-apron. When, however, the governor-disk N is rotated at a sufficient speed to throw the weighted arms n^2 outwardly, so as to bring the friction-surfaces n^4 into operative relation with the friction-flange n', the pinion n and disk N^2 will be rotated, thus imparting motion to the carrier-apron. The spring n^5 of the governor will be so adjusted that the weighted arms will not be thrown out, so as to couple the disks N and N^2 together, until sufficient speed has been attained by the parts of the thrasher and the shaft G to thoroughly thrash the grain, when the parts will be automatically coupled together and the carrier-apron will be thrown into operation. Should the speed of the cylinder decrease for any cause, so as not to be able to thoroughly thrash the grain, this will cause a slowing up of the band-cutting and feeding mechanism and will instantly effect the stoppage of the carrier-apron, as the weighted arms n^2 will release the friction-flange n', thus preventing any more grain from being delivered to the band-cutter and the movable hopper-bottom and absolutely preventing the choking of the machine, which would otherwise occur if the apron was not stopped.

When it is desired to transport the machine, the pins c^2 c^2 will be removed and the carrier moved forward by balancing it upon the legs L L, and the rear end is then elevated by depressing the forward end until the rear end rests upon rollers P P, secured to the upper part of the casing C, when the carrier will be pushed rearwardly and placed upon the top of the thrasher.

A very advantageous result is accomplished by placing the governor between the driving-shaft of the carrier and the driving means therefor. By this construction, as soon as the speed of the cylinder is lowered the carrier is instantly stopped, so as not to feed any more grain into the machine, while the band-cutters and the reciprocating hopper bottom continue to move and thus dispose of what grain is in the casing C, leaving it clear to receive grain as soon as the high speed is resumed, when the carrier is instantly thrown into gear automatically by the governor.

What I claim, and desire to secure by Letters Patent, is—

1. In a band-cutter and feeder the combination with the reciprocating hopper-bottom, of the removable bottom board for supporting one end of the same, said board having one edge supported adjacent to the concave and provided with lateral projections adjacent to its other edge and the spring-hangers having recesses for engaging said projections, substantially as described.

2. In a band-cutter and feeder the combination with the band-cutting devices, of a reciprocating hopper-bottom, composed of slats and saws secured to said slats, each saw having a flange engaging the lower face of the next adjacent slat, substantially as described.

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

WILLIAM W. DINGEE.

Witnesses:
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J. D. KINGSBERY.