

W. A. HANCE.
FEED CUTTER.
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1,159,935.

Patented Nov. 9, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

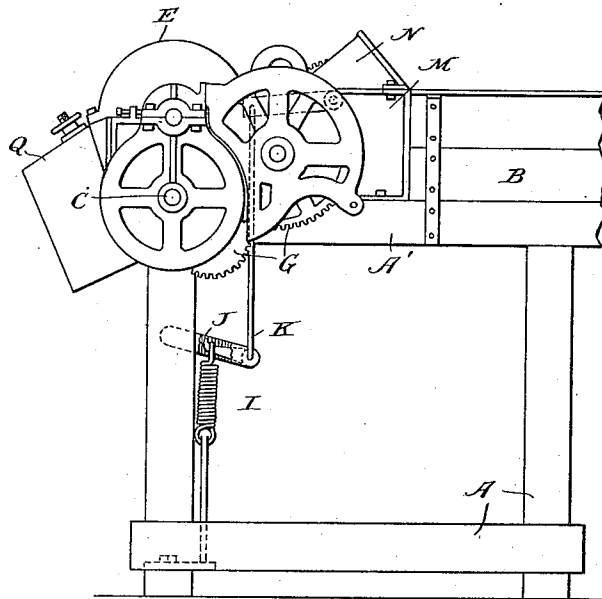
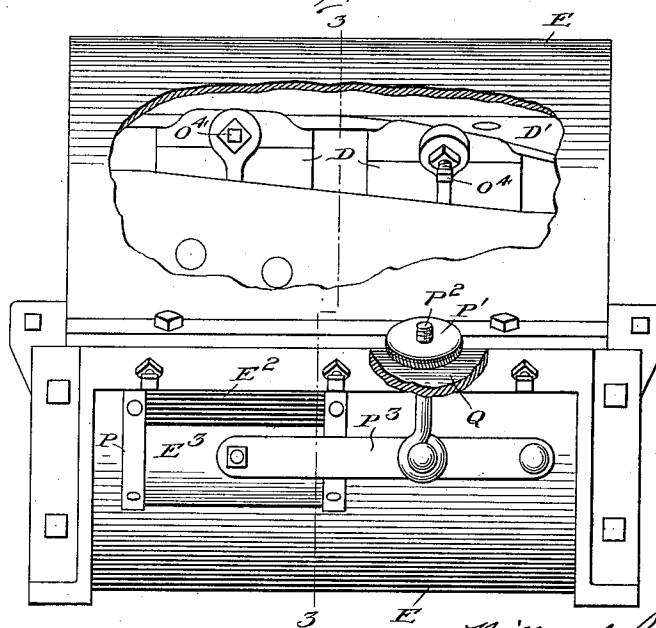


Fig. 2.



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FEED CUTTER.

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2 SHEETS--SHEET 2.



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UNITED STATES PATENT OFFICE.

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FEED-CUTTER.

1,159,935.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLARD A. HANCE, a citizen of the United States, residing at Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Feed-Cutters, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to machines for comminuting alfalfa and the like and it provides an improved machine capable of cutting satisfactorily, economically, and to any desired fineness either green or dry material, without danger of clogging.

Provision is made for automatically feeding the material to cutting devices inclosed in a casing and so regulating the discharge of the product that while the material is fed and delivered continuously, it is subjected to cutting action for any desired length of time. To avoid clogging, the casing in which the cutters rotate is large enough to leave a considerable free space on all sides of the cutters. Provision is also made for discharging at once and mixing with the cut product any fine material that may be freed, from the mass to be cut, by the feed rollers or otherwise while that mass is in the feeding chute.

In the accompanying drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a partial end elevation of the machine looking from the left in Fig. 1, parts being broken away. Fig. 3 is a longitudinal section of the body of the machine.

In these figures, A, A' represents any suitable frame having a trough or feed chute B, and C a cutter shaft mounted in the frame and rotated in any suitable way. On the shaft are fixed spiders or cutter heads D having their arms turned angularly out of registry to receive spiral cutters or knives D' which co-act with two nearly opposite adjustably fixed knife bars D². As shown in this instance, there are two pairs of spiral knives and a single pair of fixed knives.

A casing E, the upper portion of which is removable, incloses the rotary cutting devices, but at some distance outside their path, and is provided with a broad throat E' for the entering material, and on the opposite side near one end with a lateral discharge opening E² just below one of the sta-

tionary knives, and from this latter opening the product of the machine is delivered to a discharge spout Q. Co-acting feed rollers F, F' are located near the throat E', the lower and preferably smooth one being driven from the shaft C by gearing, without novelty, at G. This roller projects into the feed chute through an opening B' large enough to allow fine material to pass freely downward alongside the roller and out of the chute, to be received in a fixed spout L which delivers it with the cut product discharged beyond the cutting devices. The upper and preferably corrugated roller, F', is mounted in or near the free ends of links H pivoted at H' to the chute walls and the side walls of the passage are provided with curved slots allowing this roller to rise and fall. Whatever its position, this roller is driven from the shaft of the lower roller by gearing G', without novelty, and is drawn toward the lower ends of the slots by a spring I engaging between its end a rigid, broadly forked, lever J (without novelty), pivoted at one end to the frame and having its opposite end connected, by links K, to the links H. The feed rollers are preferably covered by an extension M of the main casing and a broad converging hood N to guide and slightly compress the entering material.

Each cutter head D is provided with lugs O having curved seats upon which rest cylindrically curved sliding saddles O' having at one margin outwardly projecting lugs against which press screws O⁴ working in the lugs O. The saddles are provided with slot apertures O² for bolts O³ by which the knives are rigidly secured. The nuts on these bolts being loosened, the saddles and knives may be adjusted by means of the screws O⁴, the two ends being separately adjustable. These knives are in form similar to the spiral knives ordinarily employed in lawn mowers, but they are chisel-edged, for easy cutting, and are of course readily ground to desired sharpness. Both stationary knives project within the casing to the path of the rotary knives and the one near the discharge opening forms a nearly radial ledge or shoulder against which material is forced by the rotary structure and thus indirectly urged outward. It is to be noted that owing to the spiral form of the knives they tend to carry material in the casing

toward the end having no discharge opening, so that there is less prompt discharge and the material is subjected to more cutting by the knives. Practically, however, the material is gradually discharged without undesirable clogging, owing to the considerable open space around the rotating knives. The discharge occurring when the opening is unobstructed may be still further delayed by means of a sliding door or gate E³ which moves in ways P and is adjusted by a hand wheel P' working against the upper wall of the spout Q to swing a bar P³ pivotally connected at one end to the casing and at the other to the gate, the swinging being caused directly by a screw P² upon which the wheel P' is threaded. In adjusting the spiral knives, the saddles being pushed forward by the screws, the edges of the knives are thrown outward as well as forward, owing to the curvature of the saddle seats, and hence even when the knives have been worn or ground so far as to greatly reduce their width, only very slight movement of the adjusting screws is needed to bring the edges into position for co-acting perfectly with the stationary knives.

What I claim is:

1. The combination with a casing having on one side a broad inlet passage and upon the opposite side of the vertical plane of its axis an outlet opening, of a knife bar longitudinal with respect to the casing, projecting uniformly into the same and fixed alongside the lower side of said passage, a second knife bar similarly arranged alongside the upper margin of said opening, and cutters rotating about the axis of the casing and each having a cutting edge in position to co-act throughout its length with each of said knife bars, said casing being closed on the upper and lower sides and said outlet passage permitting material to escape at one end only of the casing.

2. The combination with a casing closed above and below and having on one side an outlet opening and on the opposite side an inlet passage, of a fixed knife bar extending from end to end of the casing at that side of said opening toward which cutters move in crossing it, and projecting to some distance within the same to serve as a stop for material as well as for cutting, and cutters arranged to rotate about the axis of the casing, carry material continuously across said opening to said knife bar and cut a

portion thereof while forcing another portion through said opening.

3. The combination with a casing closed above and below and having on one side a discharge opening and on the opposite side an inlet passage, of a fixed knife extending from end to end of the casing and projecting to some distance within the same at the side where cutters leave the same to serve as a stop for material as well as for cutting, cutters arranged to rotate about the axis of the casing to carry material across said opening to said knife and cut a portion of the same while forcing another portion out through the opening, and means for adjusting the distance from the knife to the opposite side of the opening.

4. In apparatus of the class described, the combination with a casing having near one end a lateral discharge opening and provided with an angularly distant inlet passage extending approximately from end to end thereof, of rotary spirally curved cutting devices mounted in the casing and adapted to urge material within the casing toward the end opposite said lateral opening.

5. In apparatus of the class described, the combination with a material-confining casing having an outlet opening near one end and an angularly distant inlet passage extending from end to end thereof, of a fixed knife extending alongside said passage, a rotary spiral cutter within the casing, adapted to co-act with said knife, shear off entering material and force it laterally away from said passage; the inclination of said cutter adapting it to urge the material sheared off away from said opening and toward the opposite end of the casing.

6. In apparatus of the class described, the combination with a casing having a lateral discharge opening and a suitable inlet passage, of a spiral shearing cutter having its cutting edge arranged to describe, in rotating, a cylindrical surface, and a fixed knife co-acting with said edge and forming at that side of the opening at which the cutter leaves it a wall for guiding comminuted material outward through said opening.

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

WILLARD A. HANCE.

Witnesses:

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