

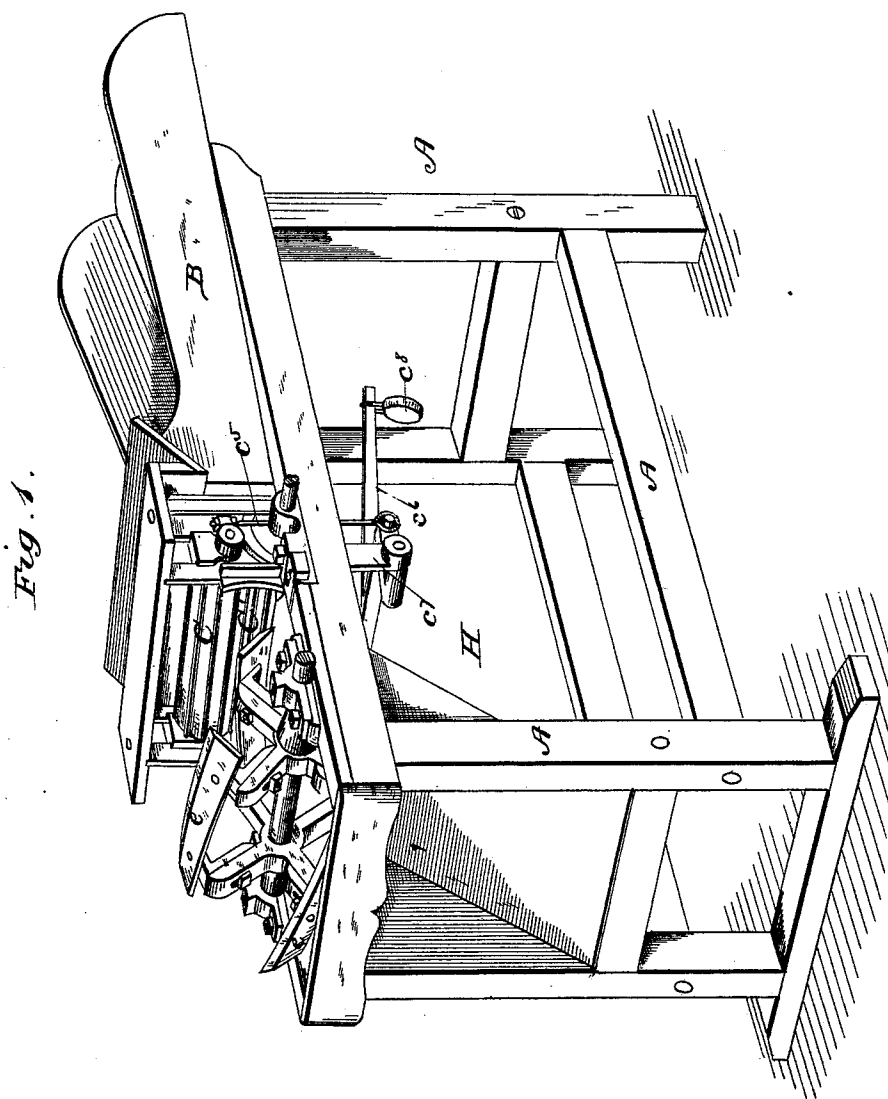
(No Model.)

3 Sheets—Sheet 1.

D. S., I. D. & W. D. HEEBNER.
Feed Cutter

No. 234,183.

Patented Nov. 9, 1880.



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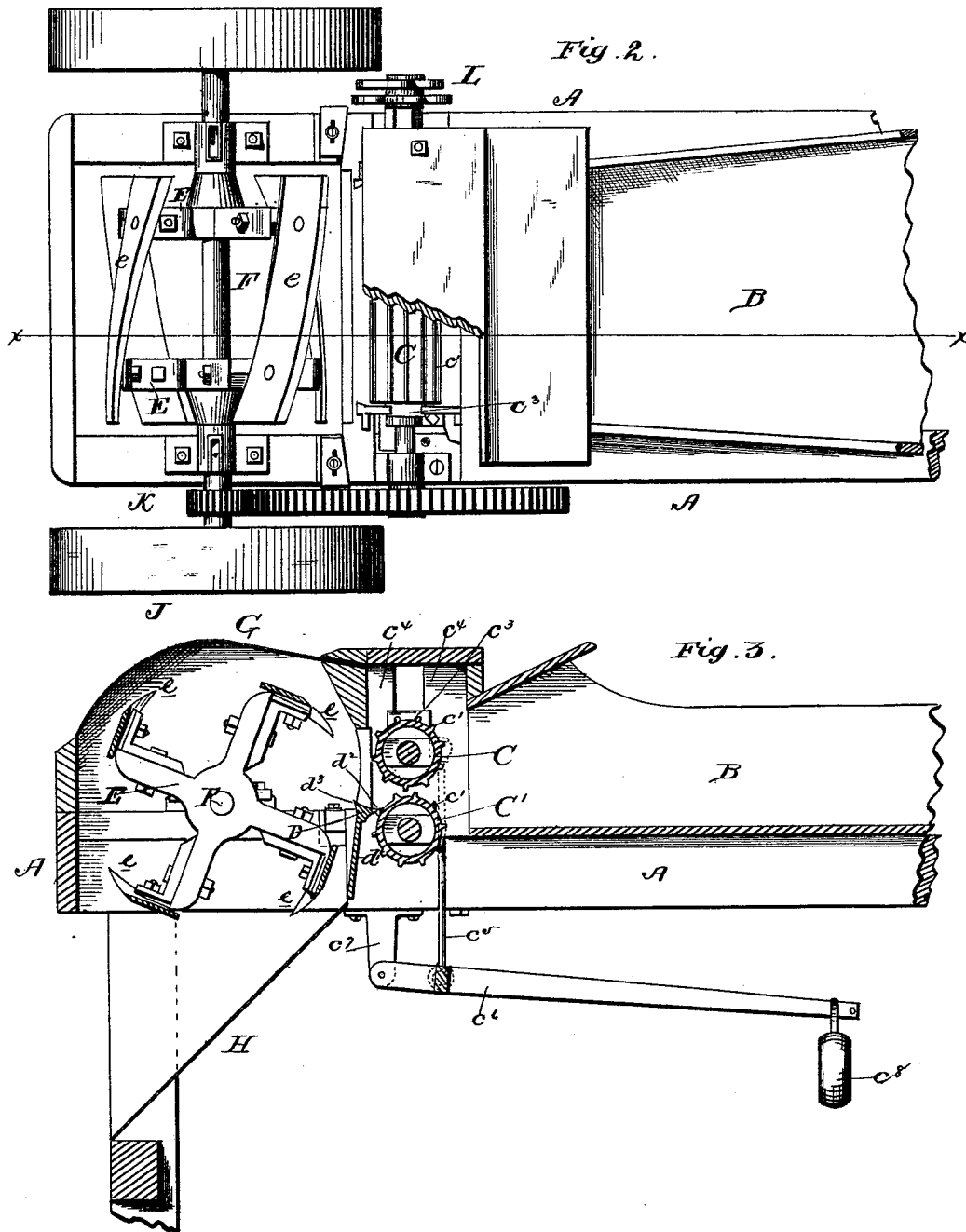
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3 Sheets—Sheet 2.

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(No Model.)

3 Sheets—Sheet 3.

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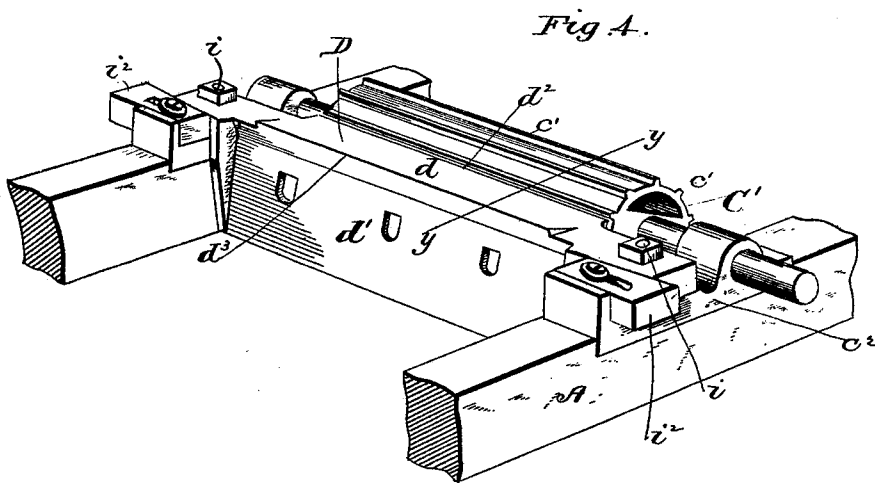


Fig. 5.

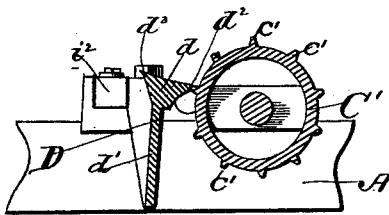


Fig. 6.

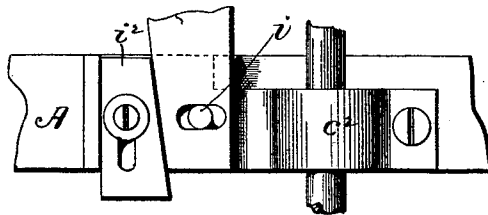


Fig. 7.

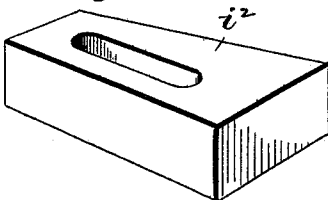


Fig. 8.

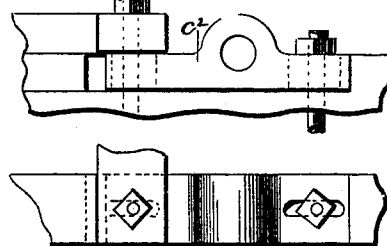
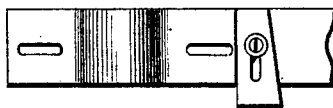


Fig. 9.



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UNITED STATES PATENT OFFICE.

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FEED-CUTTER.

SPECIFICATION forming part of Letters Patent No. 234,183, dated November 9, 1880.

Application filed September 16, 1880. (No model.)

To all whom it may concern:

Be it known that we, DAVID S. HEEBNER, ISAAC D. HEEBNER, and WILLIAM D. HEEBNER, all of Lansdale, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Feed-Cutters; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a perspective view of the machine with the driving-gear and the casing for the rotary cutters removed. Fig. 2 is a plan view with parts broken away. Fig. 3 is a longitudinal vertical sectional view taken on the line *x x*, Fig. 2. Fig. 4 is a perspective view, showing the lower feed-roll, the stationary knife or cutter, and the means for adjusting said cutter. Fig. 5 is a sectional view taken on the line *y y*, Fig. 4. Fig. 6 is a detailed view of the means for adjusting the fixed knife; Fig. 7, a view of one of the adjusting-wedges, and Figs. 8 and 9 views of modified forms of adjusting devices.

Similar letters of reference in the several figures denote the same parts.

This invention has for its object to improve the construction and operation of that class of feed-cutting machines in which the material to be cut is drawn from a box or trough by means of feeding-rollers into position to be operated upon by a rotary cutting knife or knives and a co-operating stationary cutter; and the invention consists, first, in providing one of the feed-rolls with corrugations adapted to co-operate with a stationary knife to cut off the material that winds about said roll.

It further consists in the employment of an upper corrugated feed-roll, a lower corrugated roll of similar construction, and a cutting-blade for co-operating with the corrugations of the lower roll.

It further consists in the combination of the corrugated feed-roll with a knife or cutter adapted to be adjusted to and from said roll.

It further consists in the combination, with the rotary cutting-blades and the feed-roll, cor-

rugated as aforesaid, of a stationary cutting-knife having double cutting-edges, one of which is adapted to co-operate with the rotary cutters and the other with the feed-roll.

It further consists in the combination of the corrugated feed-rolls, the two-edged knife adjustable to and from the same, and the rotary cutting-blades adjustable radially on their supports, all as we will now proceed to describe.

In the drawings, A represents the main frame of the machine, constructed in a strong and substantial manner, as more clearly indicated in Fig. 1, and carrying upon its top the box or trough, in which the hay, straw, or other material to be cut is first placed, and from which it is fed to the cutting devices. At the forward end of the box the feed-rolls C C' are located. These rolls are preferably made hollow and formed with longitudinal peripheral ribs or corrugations *c'*, as shown. The lower roll has its bearings in boxes or bearing-plates *c*², secured to the top of the main frame, while the upper roll is mounted in movable boxes *c*³, which fit and are adapted to slide up and down between vertical standards or guides *c*⁴ of the roll-frame to and from the lower roll.

To the projecting journals of the upper roll are connected rods *c*⁵ *c*⁶, which extend vertically downward and are secured to an arm or lever, *c*⁶, articulated to brackets *c*⁷ on the under side of the frame, and having a weight, *c*⁸, hung on its outer end.

By adjusting the weight at different points upon the lever the amount of pressure which the upper roll exerts upon the material fed through may be regulated at pleasure. It may be here observed that the upper roll is not permitted to come into actual contact with the lower roll, but is allowed to approach only so near as will insure an effective feed.

Secured to the frame of the machine, and extending from side to side thereof in front of the lower feed-roll, is the stationary knife or cutter D. It consists of an upper portion or head, *d*, and a lower portion or shank, *d'*, as shown in Figs. 3, 4, and 5. The upper portion, *d*, is curved or concaved slightly on top, and is cut away on curved lines at its sides so

as to form sharp self-sharpening cutting-edges d^2 d^3 , the former of which is intended to co-operate with the ribs or corrugations of the lower feed-roll and the latter with the knives or blades of the rotary cutter. The position of the cutter is also somewhat inclined—that is to say, its shank leans toward the feed-roll and its cutting-edge d^3 occupies a higher plane than that occupied by the edge d^2 .

Heretofore in machines of this class it has been customary to employ a plain lower feed-roll and a corrugated upper roll; but difficulty has been experienced from the lower roll becoming so smooth by continued use as to slip upon the material and render it necessary for the operator to assist the feed by pushing the material from behind. It has been found impracticable to use both a corrugated upper and a corrugated lower roll, because the material in such case would wind about the lower roll and interfere with the proper operation of the machine.

In the present invention, by the employment of both upper and lower corrugated rolls and the stationary cutting-knife in connection with the lower roll, a more effective feed is secured than where an upper corrugated roll only is used, and the hay or other material that has a tendency to wind about the lower roll is cut up by the co-operative action of the ribs or corrugations c' and the cutting-edge d^2 of the stationary knife.

A cutting device for cutting off wound material from the upper roll might be employed, but will not be ordinarily found necessary, as not much difficulty is ever experienced with such roll.

The rotary cutting-blades e are preferably of spiral form, so as to have a shearing action, and adjustably secured to fixed spiders E E , keyed on the main drive-shaft F by means of bolts and nuts, as shown. These cutting-blades co-operate with the cutting-edge d^3 of the stationary knife to cut or chop the material up into suitable lengths for feed.

The stationary cutter D is preferably made of cast-iron, and its upper or cutting portion is case-hardened so as to prevent its too rapid wear.

The cutting-edges d^2 d^3 do not get dull from continued use, but, on the contrary, are kept sharp thereby—that is to say, the action of the ribs of the feed-roller on the one hand and of the rotary cutting-knives on the other, while in a measure wearing upon the cutter, at the same time tends to preserve the edges sharp and perfect.

In order that the stationary cutter may be adjusted nearer to or farther from the lower feed-roll, the holes in its outer ends, through which the securing-bolts i pass, are made elongated, and said outer ends are preferably made wedge-shaped, as shown in Fig. 6, so as to co-operate with the adjusting slotted wedges r .

When it becomes necessary to adjust said cutter in either direction the nuts on the bolts i are loosened and the slotted wedges r^2 set out or in to the required point, after which the said nuts, as well as the nuts on the bolts which pass through slots in the wedges, are tightened properly.

Instead of adjusting the cutter to the roll, the roll may be adjusted to the cutter by means of devices such, for example, as shown in Figs. 8 and 9, or other equivalent devices.

The main driving-shaft F , on which the rotary cutters are mounted, is provided with two large wheels, J J , to one of which a belt from any suitable motor is applied to drive the machine. A small gear, K , is also secured to shaft F and meshes with a large gear-wheel on the shaft of the lower feed-roller. On the opposite end of the shaft of the lower feed-roll is secured a finger-wheel, L , which engages with a corresponding wheel on the upper feed-roll shaft.

From this arrangement of gearing it will be seen that the feed-wheels are made to turn together with equal speed, and that their speed, and consequently the rapidity with which the material is fed from the box, is proportionate to the velocity of the rotary cutters.

A case or cover, G , is placed over the rotary cutters to prevent the cut material from flying about, and an inclined chute, H , is arranged below said cutters to direct the cut material out at the front of the machine.

We claim as our invention—

1. In a feed-cutter, the combination of a feed-roll provided with ribs or corrugations and a stationary knife or cutter adapted to co-operate with the corrugations of said feed-roll and cut off the material that winds around said roll, substantially as described.

2. In a feed-cutter, the combination of an upper corrugated feed-roll, a lower corrugated feed-roll, and a stationary cutting-blade for co-operating with the corrugations or ribs of the lower roll, substantially as described.

3. In a feed-cutter, the combination of a lower corrugated feed-roll with an adjustable knife or cutter adapted to be adjusted to and from said roll, substantially as described.

4. In a feed-cutter, the combination, with the main rotary cutting-blades and the corrugated feed-roll, of a stationary cutter having two cutting-edges, one of which is adapted to co-operate with the rotary cutting-blades and the other with said corrugated feed-roll, substantially as described.

5. In a feed-cutter, the combination of a lower corrugated feed-roll, a two-edged knife or cutter adjustable to and from the same, and main rotary cutting-blades adjustable radially in their supports to and from the said two-edged cutters, substantially as described.

6. The stationary cutter D , inclined as described, and having its upper part concaved

on top and curved on its side so as to form the cutting-edge d^2 , in combination with the feed-roll C' , having the ribs or corrugations c' , substantially as described.

5 7. The combination, with the lower corrugated roll, C' , the cutter D , and the slotted wedges i^2 , by means of which the said cutter is adjusted to and from the feed-roll, substantially as described.

10 8. The cutter D , constructed as described,

and having the edge $d^2 d^3$, in combination with the corrugated lower feed-roll and the rotary cutters, substantially as described.

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Witnesses:

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