Sheet 1-2, Sheets.

H. A. Buck,

Feed Cutter.

No. 112,117. Patented Feb. 28. 1871.

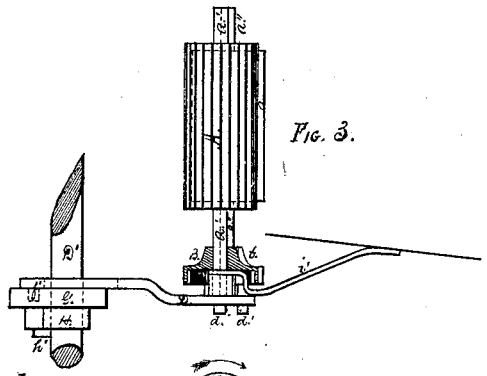

Fig. 3.

Fig. 2.

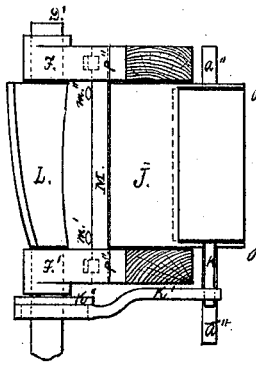

Fig. 5.

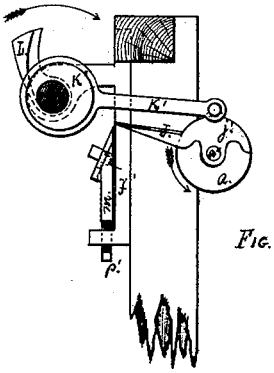

Fig. 4.

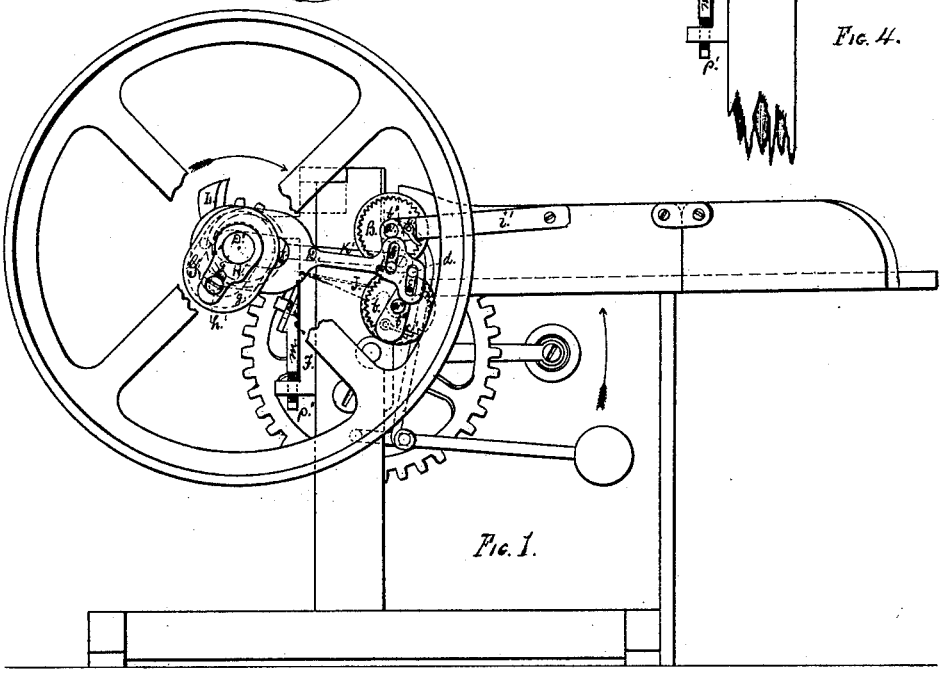

Fig. 1.

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Sheet 2-2 Sheets.

Feed Cutter.

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Fig. 6.

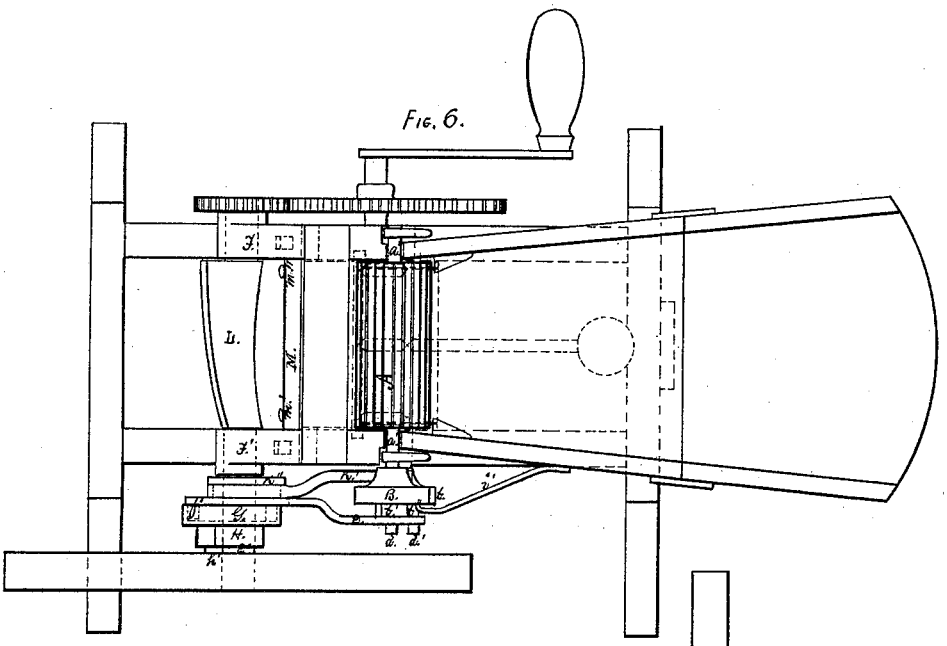
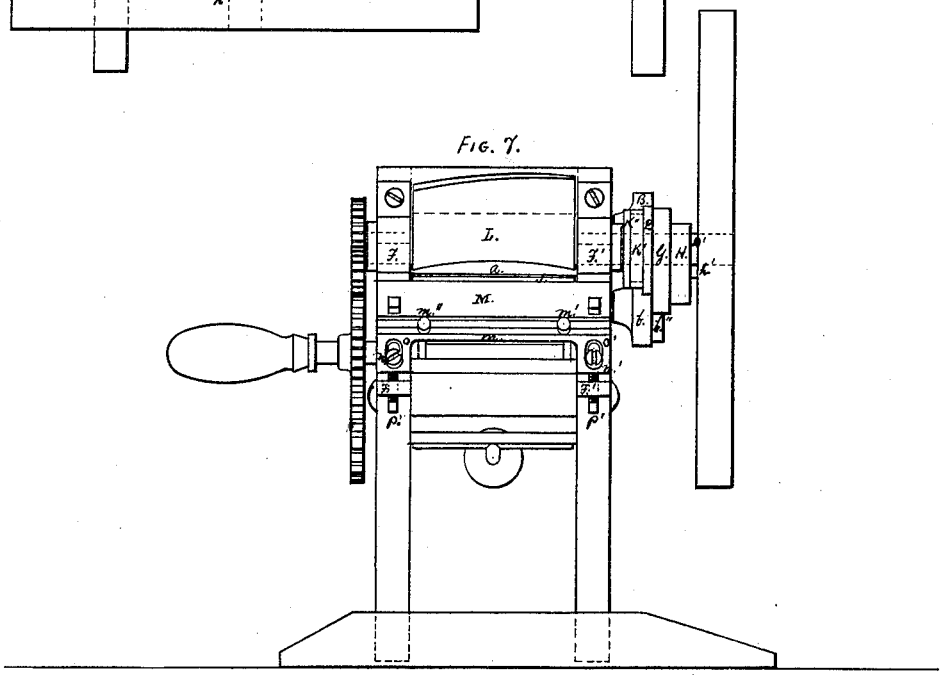


Fig. 7.



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HENRY A. BUCK, OF FREDONIA, NEW YORK.

Letters Patent No. 112,117, dated February 28, 1871.

IMPROVEMENT IN FEED-CUTTERS.

The Schedule referred to in these Letters Patent and making part of the same.

I, HENRY A. BUCK, formerly of Meadville, in the county of Crawford and State of Pennsylvania, but now residing at Fredonia, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Feed-Cutters, of which the following is a specification.

My invention relates to that class of feed-cutters, in which intermittent rotating feed-rollers are combined with rotating knives.

The object of the first part of my improvement is to render the feed adjustable to vary the length of cut, and also the relative movements of the feed-rollers and cutter; and the improvement consists in mounting on the driving-shaft an elliptical cam having semicircular ends curved in an arc of which the driving-shaft forms the centre. This cam is provided with an elliptical guide-slot in which a pin on a connecting-rod takes and by which it is driven. This rod actuates the feed-rollers. The cam can be turned on its shaft to adjust it relatively to the feed.

The object of the next part of my invention is to enable the feed-rolls to work at a distance apart constantly varying, in order to accommodate irregularities in the feed without interrupting the proper operation of the rollers, and the improvement consists in forming slots on the connecting-rod, in which slots play pins on the vibrating arms which actuate the rollers; the rollers are thus free to approach or recede from each other without interrupting their operation.

My improvement further consists in combining a fixed knife, a rotary-cutter, and a lifting-plate, which at proper intervals lifts the feed over the knife.

In the accompanying drawing, which shows all my improvements embodied in one convenient way,

Figure 1 is a side elevation of my improved machine;

Figure 2 is a similar view of the driving mechanism;

Figure 3 is a plan of the same;

Figure 4 is a side elevation of the cutting apparatus, detached;

Figure 5 is a plan of the same;

Figure 6 is plan of the entire machine; and

Figure 7, a front elevation of the same.

Power is imparted to a driving-shaft D′ in the usual way. An arm, H, projects from this shaft. An elliptical cam, G, is also mounted on the shaft D′, and provided with an elongated slot, *g′*, to permit it to be adjusted on the shaft, the slot being of a width slightly exceeding the diameter of the shaft. This adjustment is effected by means of a set screw *h′* passing through the arm H into the cam and holding it in the position desired.

An elliptical guide-slot, *g*, having ends curved in an arc of which the shaft D′ forms the center, is formed in one side of the cam, as shown in dotted lines in fig. 2. A pin *f*, on a connecting-rod D, traverses this guide-slot. The connecting-rod D is bifurcated or slotted to embrace the driving-shaft D′, and the pin *f* is on its forward end.

The rear end of the connecting-rod is provided with vertical slots E E′ into which take pins *d d′*, on vibrating arms *b b″*, each vibrating freely on the axis of one of the feed-rollers A *a*. The lower feed-roller *a* revolves in fixed bearings in the frame, while the upper one, A, has its bearings in levers *i′*, counterbalanced by weights or springs and pivoted to allow this roller to rise and fall in a manner common to feed-cutters, and which need not, therefore, be more particularly described here.

Circular ratchets B *b* are fixed on and turn with their respective axles *a′ a″*. Each of the vibrating arms *b′ b″*, above-mentioned, carries a pawl, *c c′*, which takes into its respective ratchet B *b*. The upper vibrating arm *b′* extends from the centre to the circumference of its ratchet B, and carries a pawl, *c*, which engages with the ratchet. A similar pawl, *i*, on the lever *i′*, prevents any backward movement of the ratchet. The length of the lower vibrating arm *b″* slightly exceeds the diameter of its ratchet *b*, and its pawl *c′* is pivoted to the lower end of this arm.

A fixed knife, M, is secured to the frame, rendered adjustable, and permitted to yield slightly, to prevent jars or breakage, in the following manner: The knife M is secured to a bed-plate, *m*, by screws or otherwise, and is prevented from springing by stops *m′ m″*. The bed-plate *m* is secured to the framing F F′ by means of screws *n n′* inserted through elongated slots *o o* in the plate. The bed-plate can be adjusted by this means. The proper relative adjustment between the knife M and cutter L is effected by set-screws *p p′* passing through the framing F F′, and bearing on the bed-plate *m*. This device compensates the wear of the fixed knife. An elastic cushion, *p″*, is inserted between the bed-plate *m* and framing F F′.

A rotating cutter or revolving pressure-wing L is mounted on the driving-shaft D′, and works close to the edge of the fixed knife.

A vibrating plate, J, is arranged between the fixed knife and the feed-rolls, being secured to arms *j′ j″* oscillating on the shaft *a″* of the lower feed-roll. An eccentric, K″, on the driving-shaft D′, vibrates this plate through a pitman, K′.

In operation, the material to be cut is placed in the feed-trough and the driving-shaft D′ revolved in the proper direction. The rotation of the cam G reciprocates the connecting-rod D, which rocks the vibrating arms *b′ b″*; these, by means of their pawls and ratchets, impart an intermittent rotary motion to the

feed-rolls A *a*, in the direction shown by the arrows. The feed is thus drawn in between the rollers at intervals. Should an excess of feed separate the rollers the slots and pins compensate this movement without stopping the feed. Each forward movement of the rolls is followed by a pause, as the connecting-rod remains stationary while the pin *f* is passing around that portion of the guide-slot *g* which is concentric with the shaft D'; when the connecting-rod is retracted the pawls slip over their ratchets and the feed-rolls remain stationary until the next forward movement of the connecting-rod. A long pause followed by a short feed movement is thus secured. By a forward movement of the connecting-rod I mean a movement in the same direction as the feed.

Simultaneously with the feed movement the vibrating-plate J rises and lifts the feed over the edge of the knife, and then drops quickly out of the way as the revolving cutter comes around and shears off the material projecting beyond the fixed knife.

I am aware that rotary-cutters, fixed-cutters, and intermittent feeds are common, and therefore do not broadly claim such devices.

I claim as my invention—

1. The combination of the reciprocating connecting-rod, slotted as described, at the ends next the feed-wheels; the vibrating arms oscillating on the axes of the feed-wheels; the pins on the arms working in the slots in the connecting-rod; the pawls mounted on the vibrating arms; the ratchets on the feed-wheel shafts; and the feed-wheels; all these parts being constructed to operate in combination substantially as hereinbefore set forth, to enable the feed-wheels to work at varying distances apart.

2. The combination of the driving-shaft, the rotating cutter, the stationary knife, the vibrating lifting-plate, and the cam and pitman which vibrate said plate; all these parts being constructed to operate in combination substantially as hereinbefore set forth.

Witnesses: HENRY A. BUCK.

RANSOM C. WRIGHT,

JOHN DAVENPORT.