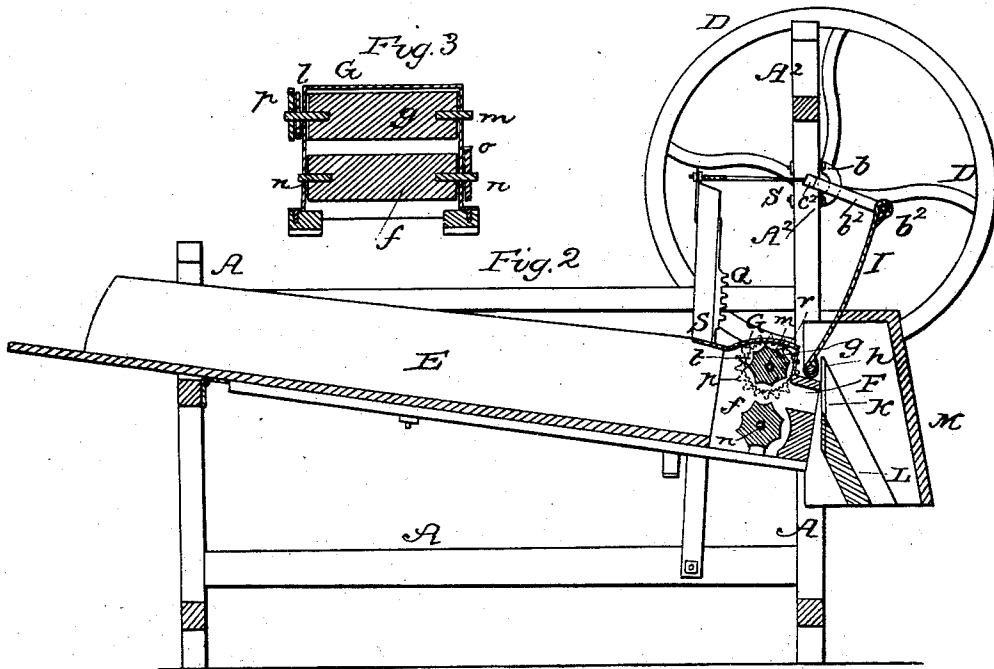
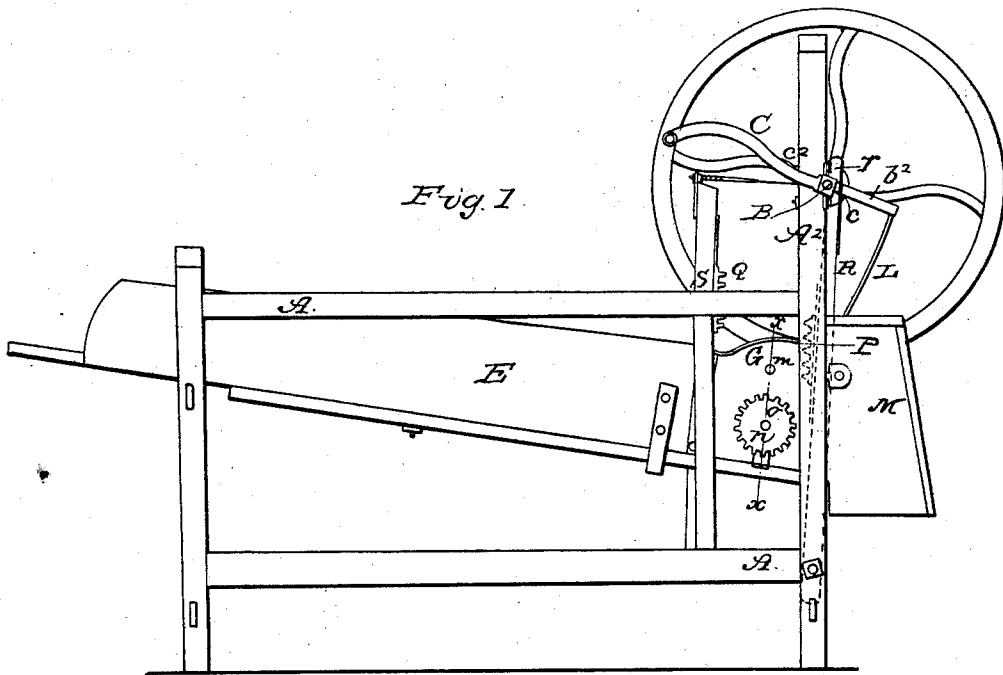


ROOT & LLOYD.

Straw Cutter.

No. 27,931.

Patented April 17, 1860.



UNITED STATES PATENT OFFICE.

H. S. ROOT AND THOS. LLOYD, OF MUNCY, PENNSYLVANIA.

STRAW-CUTTER.

Specification of Letters Patent No. 27,931, dated April 17, 1860.

To all whom it may concern:

Be it known that we, HENRY S. ROOT and THOMAS LLOYD, in the county of Lycoming and State of Pennsylvania, have invented a new and useful Improvement on a Machine for Cutting Hay, Straw, and Corn Fodder, to be called the "Union Straw Cutter;" and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification.

Our invention relates to certain improvements in machines for cutting straw and other similar materials and consists in a novel method of construction by which the box which contains the straw to be cut is caused to vibrate vertically while the straw is intermittently fed out at its moving end and brought periodically in contact with a stationary shearing blade, or knife, the whole weight of the box and its contents lending its inertia, in producing the cut as will be hereinafter described.

To enable those skilled in the art to make and use our invention we will proceed to describe its construction and operation referring by letters to the accompanying drawings forming part of this specification, and in which—

Figure 1 represents a side elevation of our improved machine. Fig. 2 represents a vertical longitudinal section through the center of the same. Fig. 3 represents a detail vertical section at x, x , Fig. 1.

Similar letters denote the same parts in the different views.

A, represents the frame of the machine the vertical posts of which at one end extend upward some distance as seen at A^2 to constitute supports for the bearings of the main driving shaft B. This shaft B is hung in a suitable bearing a, a , on the sides of frame posts A^2, A^2 and is formed with three "hat" cranks, one large one b^2 at its center and two smaller ones c, c^2 near its ends and located just inside of the posts A^2, A^2 , and said shaft B, is provided at one end with a suitable crank hand C and at the other end with a fly wheel D, for equalizing its revolutions and gaining inertia to assist in the cutting operation.

E, is the box of the machine which is hung at one end (that farthest from the main shaft B) on horizontal pivots, or hinges, e ,

around which its other end vibrates; in the moving end of this box E are hung two corrugated feeding rolls f, g , which are operated as will be presently explained. And beyond said rolls f, g , is formed an opening or mouth, F, (see Fig. 2) through which the straw is fed and where it is cut off—

The end of the box where the rolls f, g , are situated is covered with a curved cap plate, G, on the upper side of the mouth piece.

F, is a suitable stand, h , with a pivot or wrist pin, to which one end of a pitman I is hinged or coupled the other end of said pitman being connected to the driving crank b^2 whereby said moving end of box E, is raised and depressed at each revolution of the main shaft B.

K, is the stationary knife which is arranged obliquely, with its cutting edge upmost and in a plane tangential to the arc in which the end of the box E vibrates and so that the mouth piece, F, will move close to it as it passes up and down.

L, is an inclined guideboard running from the outer side of knife downward to guide the cut material off, and M, is a case or box to shield the cut grain from flying about and operates in conjunction with guide board L, to hopper the cut material down into a pile, or a receptacle. On one end of each of the shafts m , and n , of the feeding rolls is hung a spur gear o and p said gears o and p being hung so as to be on opposite sides of the box, E, in order that one of them, o , may mesh into the rack P, on one side of the machine and the other one, p , into the other rack, Q, on the other side of the machine; these racks P and Q are arranged on vibrating arms R and S which are jointed at their lower ends to the frame work of the machine and connected at their upper ends by band slots r, s , working around the cranks, c, c^2 . On one end of one of feed rolls shafts is arranged permanently a ratchet wheel t , provided with a pawl, V, pivoted to the side of box, E.

The operation of our improved apparatus is as follows viz: The main shaft B, being rotated in its bearing by means of the handle crank, C, (or otherwise) and the box filled and kept supplied in the usual way with straw, the movable end of box E is kept vibrating up and down in the arc of a circle by means of pitman (I) coupling it

to the main crank b^2 . The straw which has been pushed up to the rolls f and g , so that they could bite it is fed through by the said rolls in the following manner: At each
 5 ascent of the vibrating end of box E, the arms R and S are vibrated by their cranks c , c^2 in such a manner that the racks P and Q, shall come into mesh with the gears, o ,
 10 and p , just as the mouth piece F, has gotten above the knife and as the box E continues to ascend the gears o and p , are rotated by rack P and Q, and the rolls f and g , turned
 15 in opposite directions in such manner as to feed the straw through the mouth piece, F, a given amount. Now just before the box E begins to descend the racks P and Q leave the gears o and p and the box E. Then descending the protruding straw comes in
 20 contact with the stationary knife, K, and is sheared off and following down on the guide board L, and inside the case M, is deposited in a heap, or any desirable receptacle. After the protruding straws have
 25 been thus cut off, it will be seen that the mouth piece F can again ascend passing close by the knife K, and after the mouth piece gets just above the knife K, the feeding operation just above described is repeated, after which the box descending another
 30 cut is made and so on as long as desired, the box E being kept supplied with material and the shaft B kept rotating. Since the tendency of the straw forced, or wedged tightly through and between the
 35 rolls f and g , would be to make said rolls f and g , rotate back slightly after their gears o and p were relieved and since such back motion might have the gears o and p in a wrong position to come properly into mesh
 40 with the racks, P, and Q, at the next stroke it is necessary that the rolls f and g , should be retained in the position in which they

are left when the racks P and Q leave the gears o and p and to accomplish this end we place on the shaft of one of the rolls a
 45 ratchet wheel t , by which and its pawl r , said roll is kept from turning back. (It is only necessary to have a locking device on one roll as the two are pressed tightly on the straw between them and have to move
 50 together.) It will be seen that with our improvement the weight of the box E is lifted while the feed is made and then the weight or momentum of said box and its contents made to be expended in causing
 55 the cut to be made, while the fly wheel assists in equalizing the motion of the main driving shaft by its momentum.

Having described the construction and operation of our improved apparatus and
 60 not wishing to limit ourselves to any particularities of detail construction, what we claim therein as new and desire to secure by Letters Patent is:

We do not claim broadly a vibrating box, 65
 with a stationary knife, but

We claim:

1. The combination of a vibrating box with a stationary knife when the whole is
 70 arranged so as to cause the weight of the box and its contents to assist in producing the cut, as hereinbefore described.

2. We also claim the combination of the vibrating racks, P and Q, with the gears o and p , or their equivalents, substantially as
 75 hereinbefore described for the purpose of feeding the material intermittently as hereinbefore specified for the purpose set forth.

H. S. ROOT,
 THOS. LLOYD.

Witnesses:

J. P. GUYER,
 DAVID LLOYD.