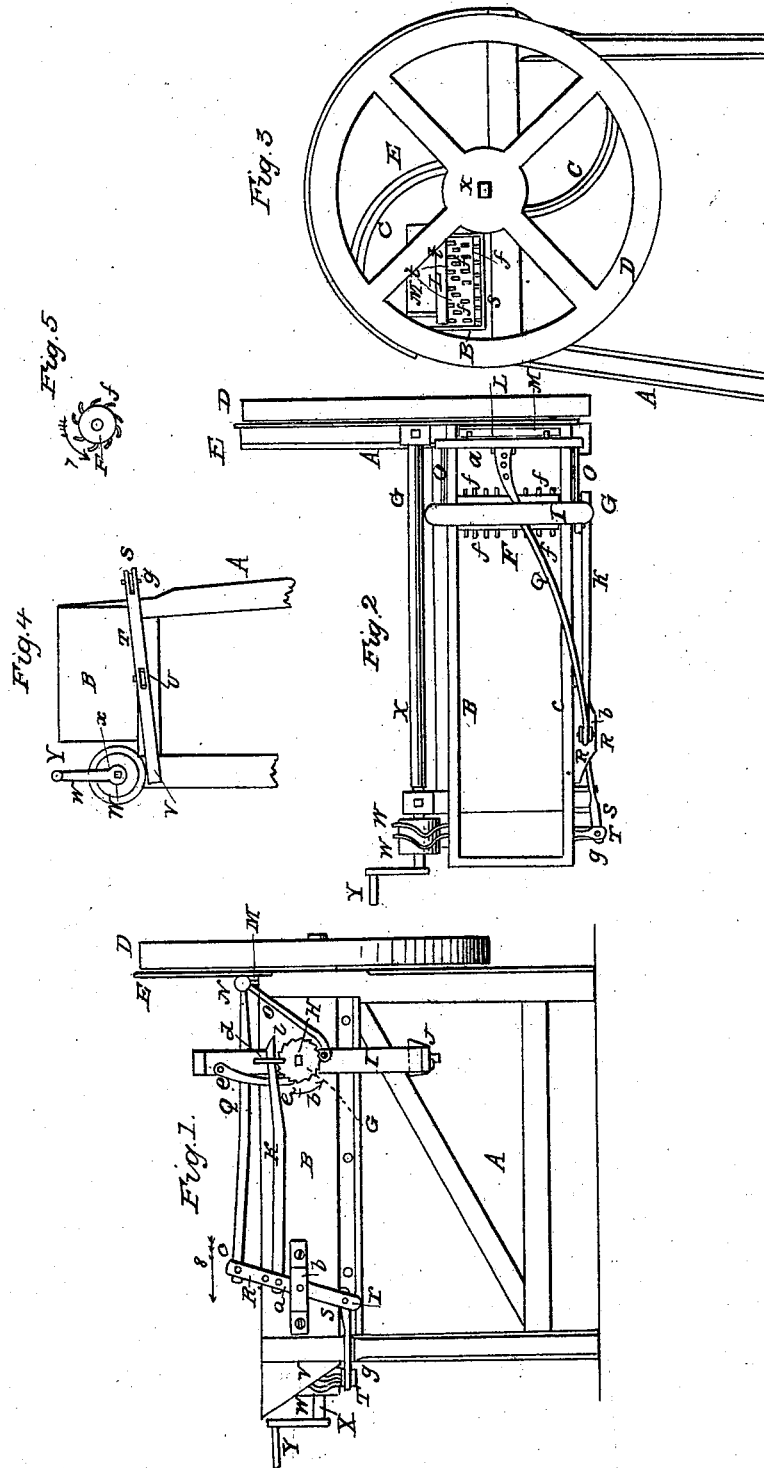


I. MAYFIELD.

Straw Cutter.

No 4,766.

Patented Sept. 19, 1846.



UNITED STATES PATENT OFFICE.

ISAAC MAYFIELD, OF ELKTON, KENTUCKY.

STRAW-CUTTER.

Specification of Letters Patent No. 4,766, dated September 19, 1846.

To all whom it may concern:

Be it known that I, ISAAC MAYFIELD, of Elkton, in the county of Todd and State of Kentucky, have invented a new and useful Improvement in Machines for Cutting Straw, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a side elevation. Fig. 2 is a top view or plan. Fig. 3 is an end elevation. Fig. 4 is a side view of the horizontal lever, and end view of the cylinder with the serpentine groove thereon. Fig. 5, an end view of the feed roller.

The nature of my invention and improvement consists in compressing the article to be cut at the mouth of the box at the moment of cutting or the descent of the knives by means of a presser of a prismoidal shape caused to move in the arc of a circle by mechanical means, said presser being attached to a horizontal transverse bar by rods said bar having two parallel arms moving on centers or pins attached to a vertical sliding frame containing the bearings of the feed roller, said bar to which the presser is attached and into which said arms are inserted being caused to move in the arc of a circle by means of a rod or sweep attached to it and to the top of a vertical lever that has a vibratory movement on a bolt or pin inserted into the side of the cutting box, the lower end of said lever being connected by a rod to one end of a horizontal vibrating lever that turns on a vertical bolt at the rear end of the cutting box, the other end of said lever having a vertical pin or cog which enters a serpentine groove made in the periphery of a revolving cylinder fixed on the end of a horizontal crank shaft to which the revolving cutting wheel is affixed.

Description.—A is the frame; B, the cutting box provided at the mouth with a row of triangular stops *s* to prevent the lateral slipping of the straw; C, the cutters; D, the cutter wheel; E, the guard attached to the frame; F, the feed roller; G, the axle of the feed roller; H, a rag wheel on the axle of the said feed roller.

I is the weighted vertical sliding frame containing the bearings of the feed roller.

J is the box into which the weight is placed for increasing the pressure of the feed roller upon the grain.

K is a reaching arm attached to the vertical lever R for acting against the teeth of the rag wheel for turning the feed roller.

f are small curved teeth inserted into the surface of the feed roller to act as rakes for drawing forward the straw without causing it to wrap, or twist, around the roller or become entangled thereon, see Fig. 5.

L is the prismoidal presser made of wood about as long as the cutting box is wide inside, having a row of teeth, or points, inserted into the under side therein to prevent the straw moving sideways.

M are the rods for connecting the presser to the bar N.

N is the bar composed of a piece of wood longer than the width of the box outside.

O are the arms inserted into the bar and turning on pivots P.

P, Fig. 1, are the pivots or centers on which the said arms O turn.

Q is a connecting rod or sweep for connecting the bar N to the top of the vertical vibrating lever R.

R is said vertical vibrating lever turning or moving on a bolt *b*.

S is a rod for connecting the lower end of the vertical lever R to the outer end of the horizontal lever T.

T is said horizontal vibrating lever.

U is the center on which said lever vibrates.

V is the pin inserted into the upper side of said lever T, said pin corresponding with or working in said serpentine groove W in the periphery of the revolving cylinder *w*, on the propelling shaft.

W is the serpentine groove in the cylinder.

X is the revolving crank shaft having the said grooved cylinder W on one end, and the cutter wheel on the other end, the boxes for its bearings being fixed in the frame in the usual manner.

Y is the crank for turning the shaft of the cutter wheel.

The frame A, cutting box B, cutters C, guard E, rag wheel H, are made in the usual manner.

The presser L is a bar of wood, or other suitable material, about as long as the cutting box is wide inside and of a prismoidal form in its cross section.

The triangular stops S on the upper sur-

face of the plate at the mouth of the cutting box are made of a triangular shape with their bases and perpendiculars straight and the hypothenuses sharp so that the bases may combine with the plate and the hypothenuses not impede the progress of the straw toward the cutters, as they would do if their edges were made blunt, or if round pins were substituted for the said plates.

The rods M, bar N, arms O, connecting rod Q, lever R, rod S, horizontal lever T, and reaching arm K, individually may be made in the usual manner. It is only their combination and arrangement as aforesaid that is intended to be claimed as new.

Operation.—Put a sufficient quantity of weight into the box J of the sliding frame I to bring down the roller F containing the curved rake teeth *f* upon the straw (previously put into the cutting box) with the required pressure. Then turn the crank handle Y. This turns the main shaft X, the cutter wheel D and grooved cylinder *w* simultaneously, at the same time causing the presser L to descend upon the straw and compress it to the degree required, the moment the knives or cutters pass through the straw projecting beyond the mouth of the box, the presser being caused to descend by the action of the oblique sides of the serpentine groove W on the pin or cog V in the horizontal vibrating lever T causing said lever to vibrate and with it the vertical lever R by means of the connecting rod S and simultaneously to act on the presser L by means of the rod Q that connects the bar N and lever R causing the bar and presser to move in the arc of a circle at each vibration of the levers as aforesaid. At the time the presser rises the revolving roller F of curved rake teeth *f* is turned by means of the reaching arm K connected to the vertical lever R and acting on the rag wheel H, draws forward the straw without twisting or entangling or wrapping it upon the roller. The teeth *t* in the presser and the points *s* in the box prevent the straw from moving laterally during the operation of passing the knives through the straw.

The sliding frame I is composed of two vertical parallel upright side timbers connected at their upper ends by a horizontal cap and at their lower ends by a connecting timber, upon which the box J to contain the weight is placed. The upright timbers of the frame move up and down in grooves or channels made in the outer sides of the cutting box near the mouth thereof. The horizontal cap of the frame is placed above the cutting box; and the weight-box, or box for the weight to increase the pressure of the feed roller, is arranged below the cutting box in a transverse position. The axle G of the feed roller turns in suitable boxes in the aforesaid uprights of the rising and fall-

ing frame. It also passes through oblong openings in the sides of the cutting box made of sufficient size to allow the axle to rise and fall therein.

In Fig. 3 (which is an end elevation of the machine) the horizontal plate and stops *s* the feeding roller F and curved teeth *f*, the prismoidal presser L and teeth *t* or stops inserted therein and the rods M that connect it to the bar N are seen through the opening in the guard E corresponding with the mouth of the cutting box, the presser being represented as raised. The rods M that connect the presser L to the bar N are round pieces of iron inserted into the presser and bar near their ends. The arms *o* that connect the bar N to the frame I are curved pieces of iron placed outside the cutting box having their upper ends inserted into the bar N near its outer extremities and its lower ends inserted into mortises in the sides of the rising and falling frame to which they are connected by the pins P on which they play loosely as the presser is raised or lowered. The connecting rod Q that connects the bar N to the head of the vibrating lever R is a piece of tough wood, or other suitable material, curved to the right and then to the left, as represented in Fig. 2, so as to extend from the said lever to the middle of the bar N with which it is connected by a strap and staple, as represented. The other end is connected to the lever R by a mortise and pin *c*. The lever R is a straight piece of wood, or other suitable material embraced by a cleat fastened to the side of the cutting box, through which and said lever a bolt *b* is passed horizontally into the cutting box which serves as the fulcrum of said lever. The reaching arm K for turning the rag wheel H of the feed roller is also connected to the lever R by a pin *a* passed through the lever at a point nearly equidistant between the pins *c* and *b*. A pin or cog *l* is inserted into its under side in a position to come in contact with the teeth of the rag wheel and turn it in the direction of the arrows 6 and 7 when the upper end of the lever R moves in the direction of the arrow No. 8, and to slip over said teeth without producing any change in the position of the rag wheel when the upper end of said lever R moves in a contrary direction. The reaching arm K is kept in gear with the rag wheel by means of a staple *d* inserted into the frame I. The rag wheel is prevented from turning back by a stop dog *e* connected to the frame I, having a pin inserted through it into the frame I and another pin which is kept in contact with the teeth of the rag wheel. The connecting rod S which connects the lower end of the lever R to one end of the lever T is simply a straight piece of wood, or other suitable material, of the requisite size and

strength, the union, or connection of the parts being effected by suitable mortises and connecting bolts *g* and *r*.

The lever *T* that is vibrated on its fulcrum *U* by means of the eccentric grooved wheel *w*, or cylinder, in gear therewith through the medium of the pin or cog *V* rising from said lever *T* and entering the eccentric or serpentine channel *W* formed on the circumference of the cylinder *w* and which vibrates the lever *R* by the connecting bar *S*, is composed of a bar of wood or other suitable material, of the required size and shape having its fulcrum, which is a simple vertical bolt, to pass through it near the middle, and through a tenon of a block let into the rear end of the frame—said tenon being placed in an oblong mortise in the lever *T*. The connection of the lever *T* and bar *S*, is effected by means of a vertical bolt or pin *g*. The eccentrics for vibrating the lever may be let into the circumference of the cylinder *w*, parallel to each, as represented at *W*, Figs. 1, 2 and 4 forming a continuous zigzag channel around the cylinder; or it may be formed in the cylinder itself. The pin *V* projecting upward from the surface of the lever *T* enters said endless zigzag channel and comes in contact alternately with the two eccentric plates so that as the cylinder is revolved by the crank the ends of the lever are vibrated to the right and left causing the feed roller and presser to feed and press alternately in the manner before described.

From the foregoing description it will be seen that the motions of feeding and pressing are not only positive (effected by the

motion of the serpentine grooved wheel, levers, rods, etc., but completely alternate and independent of each other. During the operation of pressing, the feeding roller is stationary and during the raising of the presser the feed roller is in action.

I do not intend to claim the principle of compressing the straw at the mouth of the cutting box at the moment the knives pass through the straw as I am aware that this has been done in various ways, for instance by treadle, by hand rake, and lastly by levers and cams, but

That which I do claim as my invention, and desire to secure by Letters Patent, is—

1. The combination and arrangement of levers, *R* and *T*, rods *Q* and *S* and reaching arm *K* and serpentine grooved wheel *W* as described for raising the presser and turning the feed roller simultaneously and for bringing down the presser at the moment the feed or reaching arm slides loosely over the teeth of the rag wheel.

2. Constructing the feed roller *F* with curved teeth *f* in the manner and for the purpose described for raking forward the straw without causing it to become entangled upon the teeth or roller as described.

3. I also claim the combination of the sharp edged triangular shaped plates or the stop *s* with the steel plate at the mouth of the cutting box constructed, arranged and operating in the manner set forth.

ISAAC MAYFIELD.

Witnesses:

WM. P. ELLIOT,

ALBERT E. H. JOHNSON.