J. WHITE.

Straw Cutter.

No. 6,454.

Patented May 15, 1849.

Fig. 1

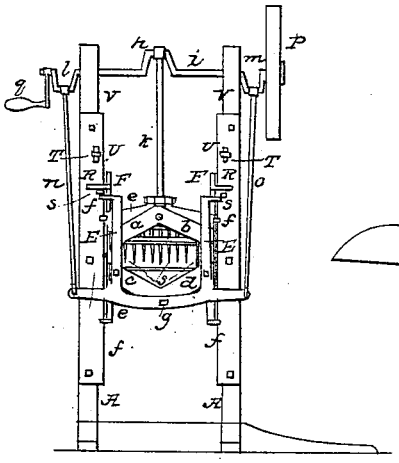


Fig. 2

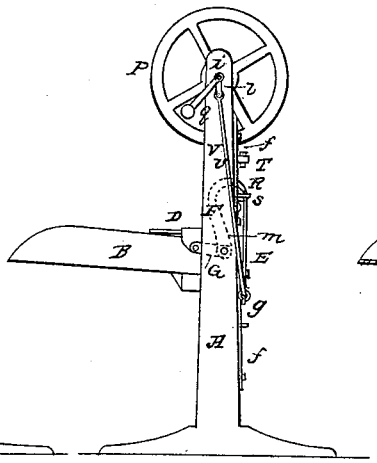


Fig. 3

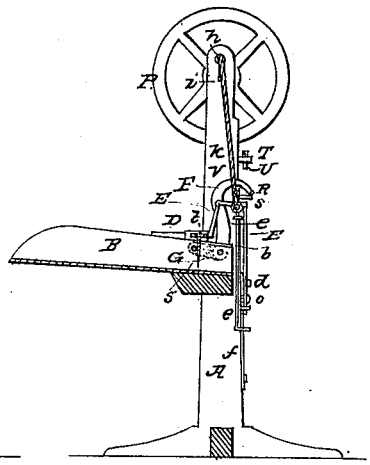


Fig. 4

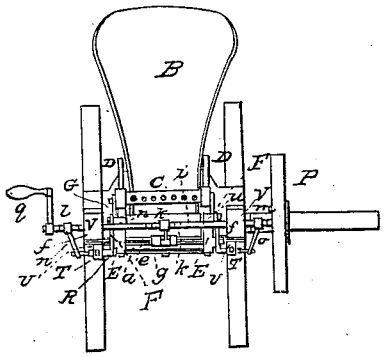
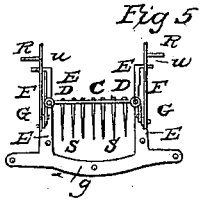


Fig. 5



N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JONATHAN WHITE, OF ANTRIM, NEW HAMPSHIRE.

STRAW-CUTTER.

Specification of Letters Patent No. 6,454, dated May 15, 1849.

To all whom it may concern:

Be it known that I, JONATHAN WHITE, of Antrim, in the county of Hillsborough and State of New Hampshire, have invented a new and useful Improvement in Straw-Cutters; and I do hereby declare that the same is fully described and represented in the following specification and accompanying drawings, letters, figures, and references thereof.

Of the said drawings Figure 1, represents a front elevation of my improved straw cutter. Fig. 2, is a side elevation of the same. Fig. 3, is a vertical central and longitudinal section of it. Fig. 4, is a top view of it. Fig. 5 is a rear view of the rake, its slide rods and operating levers.

In the said figures *a*, *b*, *c*, *d*, denote four knife edges made on two pieces of metal and arranged together so that two of them, viz *a*, and *b*, shall make an obtuse angle with one another in one direction while the other two viz *c* and *d* make a similar obtuse angle with each other in an opposite direction, the cutting edges when their outer extremities are brought in contact forming the periphery of a lozenge or parallelogram as seen in Fig. 1. The first set of two knife edges (*a b*) or the piec of metal on which they are made is fastened to a frame *e* which is supported between and by vertical and parallel ways *f*, *f*, and so as to be capable of being moved freely up and down, with a reciprocating rectilinear movement. The other two (*c*, *d*) or the piece of metal on which they are made is fixed to and supported by another and similar frame *g* which is also sustained by the parallel guides *f*, *f*, slides freely up and down on them, and is so disposed as to cause the cutting edges *a* and *c*, *b* and *d* while in motion to pass by one another and operate together with a drawing stroke, very like the blades of a pair of scissors while in the act of cutting anything.

When the driving shaft *i* is rotated the frame *e* is elevated and depressed by the action of a bell crank *h* (fixed on the middle of the shaft *i*) and a connecting rod *k*, jointed both to the crank and the frame, and in such manner as to allow of and cause the elevation and depression of the cutting edges *a*, *b*, and their frame *e*, whenever the driving shaft is put in revolution.

The other frame *g*, together with its set of cutting edges, *c*, *d*, is elevated and depressed by two similar bell cranks *l*, *m*, and two connecting rods *n o* jointed to it and the cranks, and so as to allow of the requisite motions of the frame the positions of the two cranks *l*, *m* being reversed on the driving shaft with respect to that of the crank *h*, that is to say the said cranks *l*, *m* and *h*, are so disposed with respect to each other that while the driving shaft is performing a half revolution both sets of knives may be simultaneously moved toward one another, and while it performs the other half of a revolution, they may be simultaneously moved asunder.

There is a fly wheel *p*, fixed on one end of the shaft *i*, and a crank *q*, on the other end of it, the said crank being for the purposes of enabling a person to put the machinery in motion.

The next part of my machine is that by which the straw or material to be cut or reduced by the cutting edges is drawn forward between them and at regular intervals of time, each movement forward being while the cutting edges are in the act of departing from each other.

The framework by which the operative parts of the machine are supported is shown at A, the same having an inclined shoe or table B applied to it, directly in rear of the cutting knives or edges, the said shoe or table being for the purpose of receiving the straw, and holding it while it is raked, or moved forward between the knives or cutting edges.

C is a rake or series of teeth *s*, *s*, &c., projecting down from a horizontal bar *t*, which is made to slide freely back and forth on two horizontal rods D, D (the said rake, its slide rods and operating levers being shown in side or rear view in Fig. 5) which project respectively from bent bars E, E, which extend upward from the frame, which supports the lower set of cutting edges *c*, *d*, the same being as seen in the drawings.

To each one of the bars E, E, and at or near the angle *u* thereof, and on the outer side of the bar, a bent lever F is jointed, or moves forward and back on a fulcrum placed at the angle *u*. The lower end of each of the levers F F, is connected to the rake C, by a connecting bar or rod G which is jointed both to the lever and rake, and in such manner as to permit it (the connecting rod or bar) to move or play in a vertical plane, during the movements of the rake. The upper end of each lever F, has a stud or projection R, extending from it as seen in the drawings, and between a stud or projection

S, and the lower end of a vertical regulating screw T, which is screwed down through a projection U extending from one of the posts V, V, of the main frame.

By means of the above described mechanism, the rake has motions imparted to it as follows:

First. The said rake is raised and depressed in a vertical direction by the frame *g*, during its upward and downward motions, that is to say it is caused by the frame to descend with it and to rise with it.

Second. During the latter part of each upward movement of the frame *g*, a horizontal motion rearward or away from the posts *v v*, is imparted to the rake, the same being effected by means of the screws T T, the levers F F and their connections with the rake, that is to say the projections R R are carried in contact with the lower ends of the regulating screws which serve as stops to arrest any further vertical motion of them, and of course the ends of the levers F, F, to which they are attached. When their upward motion is so arrested, while that of the frame *g*, and rake C is still continued, it follows that the levers F F, must of necessity be made to turn or move on their respective fulcra, in such manner as to crowd or force the rake in a direction rearward or away from the cutting knives or edges. Such upward and rearward motions of the rake not only lifts it out of the mass of straw laying within the spout conductor or shoe B, but carries it backward and over the same, to the position necessary for its teeth to enter within the mass of straw, when the knife frame *g*, is next made to descend.

Third. During part of the descent of the knife frame *g*, and while the two sets of knives or cutting edges are in the act of separating from each other the rake is forced down vertically into the mass of straw, and during the remainder of descent of the knife frame *g*, the rake has not only a descending movement, but at the same time a forward movement toward the knives, the said forward movement being produced, in consequence of the projections R, R, being carried in contact with the stops S, S, and the continued downward movement of the knife frame *g*, which operating together so turns the levers F, F, on their fulcra, as to cause the rake to move toward the knives and carry the straw with it, and so as to properly present it to the action of the knives when they are next moved toward one another.

By using the rake instead of feed rollers, as ordinarily employed, I find it requires very much less power to operate the machine. Besides all injury to the straw hay or other matter usually produced by compression of it between the rollers, is avoided by the employment of the rake. Feed rollers operate to press out more or less of the liquids contained in the feed which are thus lost. When the liquid is so expressed the feed is likely to become dampened thereby, and to soon become musty or unfit for cattle. Such difficulty is completely obviated by the use of the rake in manner as hereinbefore described.

I claim—

1. The combination of the rake C, with one or more sets of reducing or cutting knives or edges, and the conductor straw holder or shoe B, the said rake being made to operate therewith substantially as above described.

2. I also claim the combination of mechanism by which the rake is operated, the same consisting of the slide bars or rods D, D and their connections with the rake, one or two of the levers F made with or without its projections as occasion may require, the stop S, and the screw T, or other equivalent contrivances applied to each lever F, the whole being substantially as herein- before specified.

In testimony whereof I have hereto set my signature this twenty first day of September A D 1848.

JONATHAN WHITE.

Witnesses:

HIRAM EATON,

LUKE WOODBURY.