

R KETCHAM.

Straw Cutter.

No. 10,072.

Patented Oct. 4, 1853.

Fig. 2.

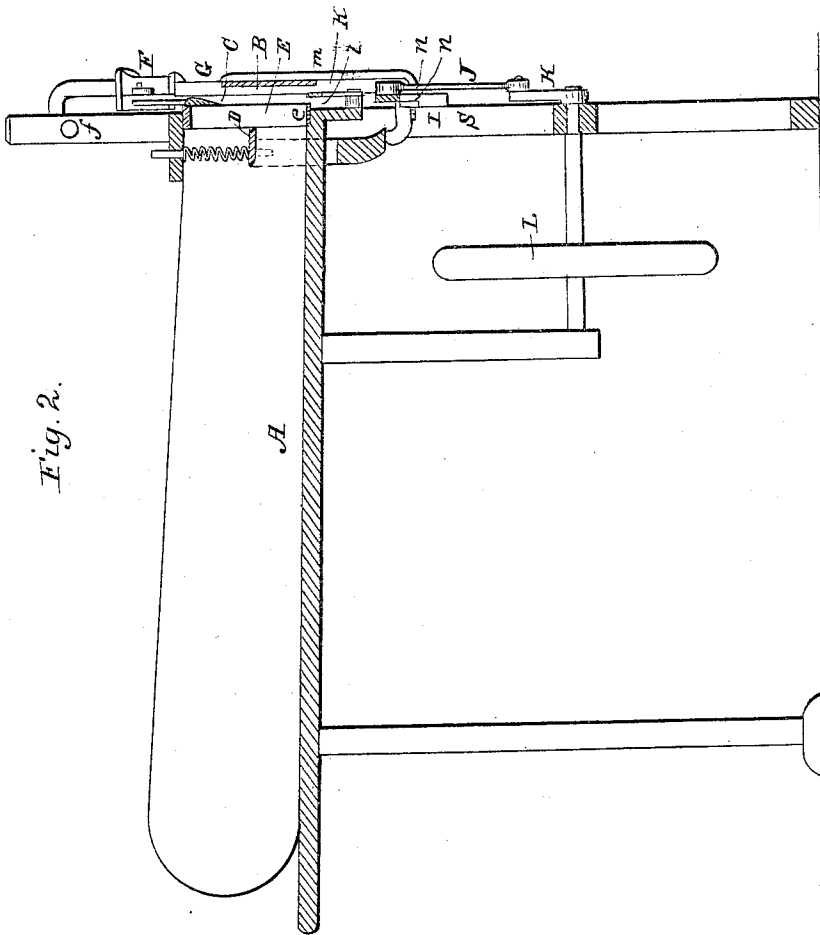
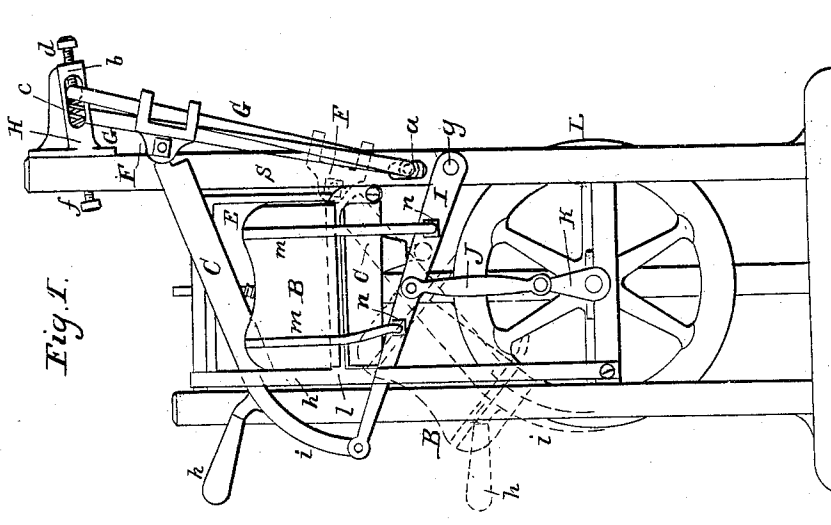


Fig. 1.



# UNITED STATES PATENT OFFICE.

RICH'D. KETCHAM, OF SENECA CASTLE, NEW YORK.

## STRAW-CUTTER.

Specification of Letters Patent No. 10,072, dated October 4, 1853.

*To all whom it may concern:*

Be it known that I, RICHARD KETCHAM, of Seneca Castle, in the county of Ontario and State of New York, have invented certain  
5 new and useful Improvements in Straw-Cutters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms part of this specification, and in  
10 which—

Figure I represents a front elevation of my improved straw cutter and Fig. 2 a longitudinal or side sectional elevation of the same.

15 In straw cutters of various kinds employing an inclined reciprocating knife, it has long been a desideratum to hang and operate the knife in such a manner that the "draw" of it may be readily increased or  
20 diminished to accommodate it to the varying resistance of the cut which is mainly dependent upon the sharpness of the blade and the nature or condition of the straw to be operated on. To effect this result, the knife  
25 has been mounted on a spring which, yielding more or less according to the resistance offered, was designed to vary the drawing stroke as required. This device however has not been found successful in practice, as the  
30 effect of the resistance was discovered not only to increase the "draw" but also to cause the knife to fly from its cut instead of maintaining or increasing its downward pressure or cutting stroke; and the vibra-  
35 tory action or shake consequent upon this arrangement was, as the spring became weaker by wear, found to render it almost inoperative. Neither is it expedient that the draw of the knife should be wholly self ad-  
40 justable, for circumstances occur where a rigid action of the knife is desirable or rather that no more drawing yield should exist than is necessary to facilitate the commencement of the cut, and the arrangements  
45 for increasing or diminishing the tendency of the knife to regulate its draw should be readily variable to suit the different conditions of the straw, or corn stalks, to be cut: to accomplish this, in a steady, durable and  
50 perfect manner, and to facilitate the cut by causing the resistance to increase the draw of the knife without inclining it to fly from the cut, is the object of one part of my invention, which further relates to a similar  
55 description of straw cutter wherein the straw is held up to the cut by a "press," and

in which the length of the cut is governed by a guard or gage in front, that, being usually attached to the knife or else made stationary, is found to clog with the cut and  
60 separated particles, which, lodging in the knife race and between the knife and the gage, increases the labor of working the machine and renders frequent stoppage to remove the obstructing particles necessary: this  
65 lodging is invariably the greatest at the back or finishing end of the knife where the particles are inclined to accumulate by the inclined action of the knife: to correct this tendency by causing the gage to rub  
70 against the outer ends of the straw, in an opposite direction to that induced by the inclination of the knife, and, at or before the finishing cut of the knife, to present an open  
75 escape for the separated particles to pass off, forms the remaining portion of my invention.

The straw cutter represented in the accompanying drawing resembles, in its general arrangement, others in common use, and  
80 in this description minute reference only will be made to those parts which form, and are immediately, or inseparably connected with my invention.

The straw is fed along a trough or hop-  
85 per (A), at intervals, in the usual way, the front end of the straw being caused to butt against the gage (B) on the ascent of the knife (C), and to be held to its cut during the descent of the knife by a press (D)  
90 which is relieved from pressure on the straw, each time the knife rises, to permit of fresh feed, as is common to other presses of the kind. Situated in front of the hopper,  
95 and projecting slightly therefrom, is a metallic box part (E) the lower strip (e) of which serves as the stationary cutting edge or table while its sides and top act as guides, at the back, to steady the knife (C), the  
100 blade of which is straight so that it may be readily sharpened. This knife (C), which reciprocates up and down against and across the front edges of the box part (E), is hung and operated in such a manner that its  
105 blade inclines downward toward its front end: it is hinged at its back extremity to a sliding guide (F) that, when the knife is in motion, works freely up and down an inclined guide rod (G) the lower end of which  
110 is bent and fitted within a vertical oblong slot (a) in the front post (S) of the frame of the machine, while its upper end is simi-

larly fitted within an oblong slot (*b*) in a spring box (H) attached to the same post and branching from the outer side thereof in a direction slightly inclining upward. A  
 5 spring (*c*) serves to press the upper end of the guide rod outward against a set screw (*d*), while a similar set screw (*f*) is employed to adjust the stress of the spring upon the said rod. The front end of the  
 10 knife is connected by a curved arm (*i*), either by joint or slide, to a sway beam or lever I which has its fulcrum (*g*) in the post (S) of the frame and which is linked by a connecting rod (J) to a crank (K) that  
 15 gives rotary motion to a fly wheel (L) the office of which is to assist the operator and induce uniformity in the action of the machine, up and down reciprocating motion being communicated to the knife by means  
 20 of a handle (*h*) projecting from the curved connecting arm (*i*). The knife is represented in the drawing at its top position in black lines and at its lower position in red lines (Fig. 1): it is guided or steadied along  
 25 its front or outside face by a vertical guard (*k*) having a horizontal arm (*l*); this guard, which is firmly secured to the frame of the machine, projects sufficiently from the front thereof to admit of the knife playing up  
 30 and down freely, but without shake, between it and the box part (E); it also serves as a guide to the lever (I) and obviates strain upon the joints of the lever and knife, also steadies the latter. The top edge of the  
 35 horizontal arm (*l*) of the guard is level with the cutting edge of the strip (*e*) and facilitates the cut by supporting the outer ends of the straw throughout the entire stroke of the knife.  
 40 The gage (B) is connected by arms (*m*) to the swaying lever (I) in such a manner that it is adjustable, by means of screw nuts (*n*), nearer to or farther from the knife, for the purpose of regulating the length of  
 45 the cut straw: its position along the lever (I), height and width is such as to cause it to assume the position represented in black lines when the lever (I) is at its top stroke and the straw to be cut is being fed.  
 50 The knife on being pressed down by the hand to cut will, it is obvious, be simultaneously projected forward: this latter action constitutes the drawing stroke of the knife and facilitates the cut. It will also be evi-  
 55 dent that the inclined position of the knife causes the latter, by the resistance met with in cutting, to exert a pressure against the inclined rod (G) to draw it inward: this tendency to strain upon the rod will, by the  
 60 arrangements described, be met by the spring (*c*) that, slightly yielding, permits the rod (G) to move inward and thereby to give the knife increased draw to overcome any in-  
 65 crease of cutting resistance: but, as will appear from the position of the rod (G) in

blue lines (Fig. 1), the action of the spring is confined to its increase of the "draw" and does not tend to cause the knife to fly from its cut which, as the manual force applied to the handle (*h*) in cutting the straw  
 70 is continued, will be maintained steady and easy, the rod (G) in moving inward being, by the arrangement of the slots (*a* and *b*), simultaneously projected downward and, by the friction of the slide (F) on it, causing  
 75 the knife to keep steady to its cut, the increase of the draw serving to assist the operation of cutting and negating any tendency of the knife to rise from its cut though a slight deviation in the cutting angle is in-  
 80 duced. This yielding action on the part of the rod (G) not only reduces the labor in cutting but allows of the knife being worked when only moderately sharp so that the delay and wear consequent upon frequently  
 85 sharpening it is avoided: it is adjustable to any required degree, so that when the knife is sharp and the nature of the work to be done makes but a slight increase of the draw desirable, the set screw (*f*) may be  
 90 turned to compress the spring tight upon the rod and render the action of the knife more rigid, or, when the opposite effect is desired to be produced, as the knife becomes  
 95 blunt or the supple condition of the straw requires it, the said screw may be slackened and the sensitiveness of the draw increased. The outer screw (*d*) likewise serves, accord-  
 100 ingly as it is worked in or out, to vary the draw or original inclined set of the guide rod to suit various cuts or resistances; while the inner screw may be employed to compensate for the weakened condition of the spring by wear, by tightening up the pressure of the latter against the rod (G). Thus  
 105 the specified arrangement of the spring, slots and screws as described, in connection with the guide rod, serves to adjust the draw to either a temporary or permanent variation in the cutting resistance as well as to check  
 110 the tendency of the knife to fly from its cut, and does not materially vary the cutting angle of the knife.

In the action of the gage (B), it is obvious that, on the top stroke of the knife, when  
 115 the press (D) is raised and the straw to be cut is being fed up, it performs the office required of it as perfectly as if it were attached to the knife, or stationary, but is  
 120 entirely free from the usual hindrances of a gage when the cut is being made, as, by its working downward and away from the back or raised end of the knife faster than the  
 125 drawing stroke of the latetr to the position represented in red lines (Fig. 1) at its bottom stroke, it not only prevents choking or collection of the cut particles between it and the knife, by working below the cutting edge and presenting a free or ready escape for  
 130 the particles to pass off, but it also, in rub-

bing against the outer ends of the straw by its specified lateral movement, counteracts the tendency exerted by the inclined cut of the knife to crowd up or work the straw toward the rear cutting end of the table and consequently renders the resistance in cutting more uniform by avoiding the usual compression of the straw which takes place at the rear end of the table when the gage is stationary or attached to and moves with the knife.

The principles of my invention, thus described, may, it is apparent, be applied in a variety of mechanical forms which it is not necessary here and would occupy too much space to specify.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The method herein described of hanging and operating the cutter by means of its pivoted attachment to the slide (F) in combination with the guide rod (G), the latter being made adjustable by the helical spring

(c) at the top, or other equivalent device, substantially as and for the purposes set forth.

2. I further claim, in combination with the inclined reciprocating knife and simultaneously with the descent thereof, giving to the gage (B) a lateral curvilinear or oblique downward action away from the rear end of the knife toward the front end thereof and below the cutting edge of the table substantially as shown and described, whereby the straw is restrained from being crowded toward the back end of the knife by the inclination of the cut and free escape is established for the cut particles to pass off, as specified.

In testimony whereof, I have hereunto subscribed my name.

RICHARD KETCHAM.

Witnesses:

A. GREGORY,  
T. DAVISON.