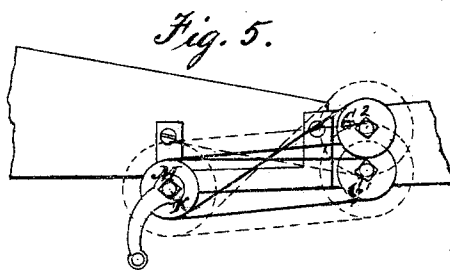
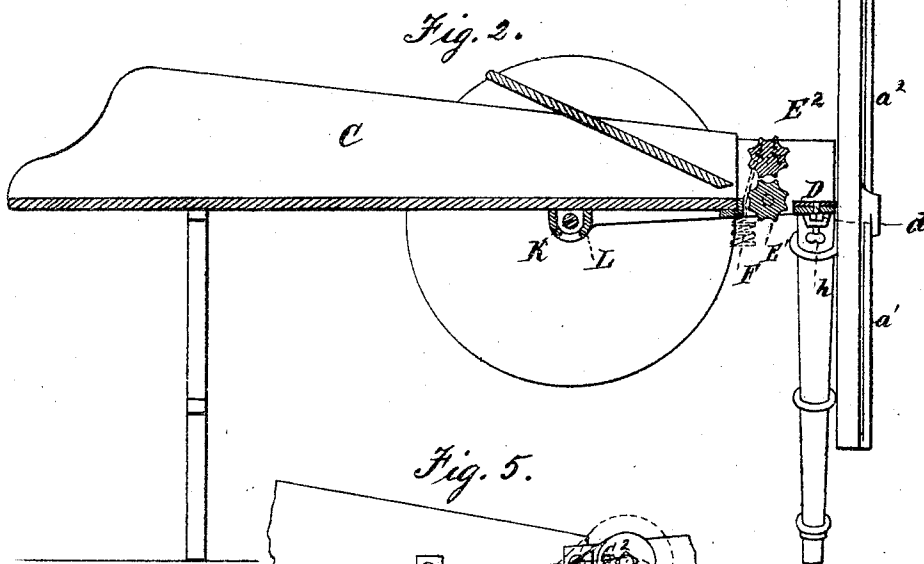
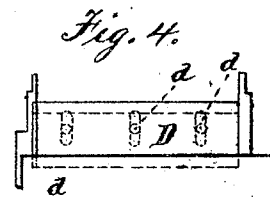
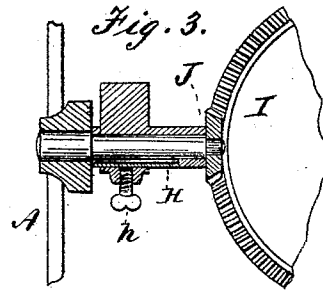
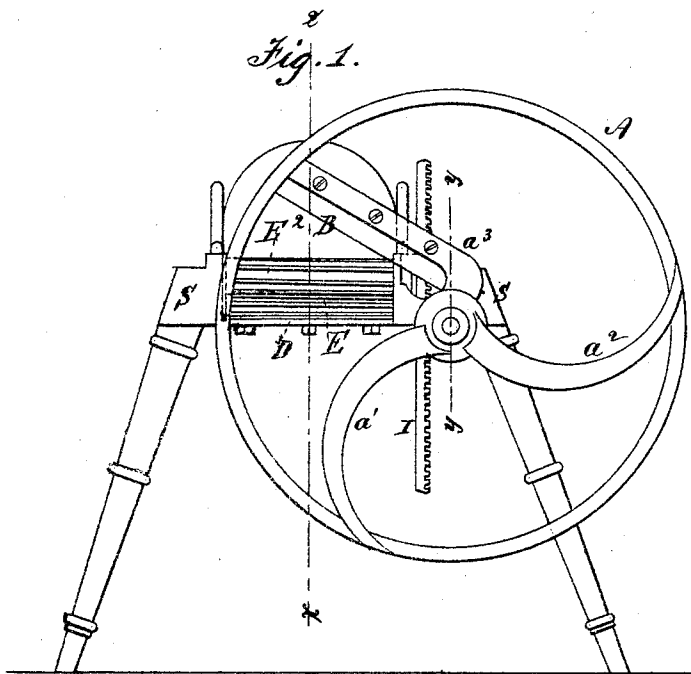


# BENJAMIN F. GRIMES.

## Improvement in Straw Cutters.

No. 118,926.

Patented Sep. 12, 1871.



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# UNITED STATES PATENT OFFICE.

BENJAMIN F. GRIMES, OF MEMPHIS, TENNESSEE.

## IMPROVEMENT IN STRAW-CUTTERS.

Specification forming part of Letters Patent No. 118,926, dated September 12, 1871.

*To all whom it may concern:*

Be it known that I, BENJAMIN F. GRIMES, of Memphis, in the county of Shelby and State of Tennessee, have invented a new and useful Improved Hay, Straw, and Corn-Stalk Cutter; and I do hereby declare that the following is a full, clear, and exact description thereof, sufficient to enable those skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawing making part of this specification and to the letters and figures marked thereon.

The nature of my invention consists in the peculiar arrangement of a half-box or removable bearing for the fly-wheel shaft. Also, in the peculiar construction and arrangement of a metallic frame-work for supporting the front end of the trough, as hereinafter particularly described.

In the accompanying drawing, Figure 1 is a front view of my improved machine. Fig. 2 is a longitudinal vertical section taken in the line  $xx$ , Fig. 1. Fig. 3 is a longitudinal vertical section taken in the line  $yy$ , Fig. 1. Fig. 4 is a view of the adjustable bed-knife. Fig. 5 is a side view, showing the arrangement of the pulleys which regulate the motion of the feed-rollers.

The fly-wheel A is formed with three spokes,  $a^1$   $a^2$   $a^3$ . The spokes  $a^1$  and  $a^2$  extend from the hub to the periphery of the wheel in curved lines. The spoke  $a^3$  extends radially from the hub for a short distance and then proceeds to the periphery in a direction perpendicular to the radial portion. To the spoke  $a^3$  the cutting-knife B is attached by means of screw-bolts and nuts, so that it can be readily removed when necessary. The knife B fits closely against the rear side of the spoke  $a^3$  at all times, and does not require "setting" to bring it nearer to or further from the bed-knife. The length of the cutting-knife B equals or slightly exceeds the width of the front end of the trough C, to which the bed-knife is attached. The bed-knife D extends the entire width of the front end of the trough, and may be of any desired width. It is secured to the trough by bolts  $d$  passing through it and fastened with nuts on the under side. The front of the trough is supported by a metallic frame-work, hereinafter described, and the portion of this frame-work which is immediately under the bed-knife has slots formed in it through which the screw-bolts  $d$  pass. Instead

of adjusting the cutting-knife to the bed-knife I adjust the bed-knife to the cutting-knife by turning the wheel until the cutting-knife is opposite the front end of the trough and then (the bolts  $d$  sliding freely in the slots) moving the bed-knife forward until in proper position, where it is secured by tightening the bolts. The bed-knife D is on a level with the center of the fly-wheel A. If the cutting-knife B extended from the center in a radial line the operation would be similar to that of a pair of scissors—that is to say, the descent of the knife would have a tendency to press the straw toward the outer end of the knife, and the hardest part of the cut would be at the point where there was the least power, namely, furthest from the fulcrum. But by attaching the cutting-knife to a spoke which extends radially a short distance and then turns at or near a right angle and proceeds outward, the motion is the reverse of a pair of scissors, for the descent of the knife has a tendency to press the straw toward the center of the wheel, (because the knife reaches the outer end of the bed-knife first,) and the hardest part of the cut is at the point where there is the most power, namely, nearest the fulcrum. I do not, however, claim this feature as new, as I am aware that the same result has been accomplished in other machines. The feed-rollers  $E^1$   $E^2$  are made of metal or other suitable material, and are in the usual form. They are placed as near as possible to the front end of the trough, so as to feed the straw to the knives in compressed condition. The lower roller  $E^1$  is journaled in rigid bearings, but the upper roller  $E^2$  is provided with elastic bearings, consisting of wire rods F, the lower portions of which form spiral springs, and the upper portions pass through holes in the frame-work which supports the trough and form hooks, which pass over the journals of the upper roller. By this means the upper roller is allowed to yield and adjust itself to any hard substance passing under it. The shafts of the feed-rollers are made angular in form outside of the journals, and on the angular portion the pulleys  $G^1$   $G^2$  are placed, and may be secured by nuts or by simply passing pins through holes made for the purpose. The pulleys are made of different sizes, so that when it is desired to change the speed of the feed-rollers, in order to cut the straw longer or shorter, the pulleys are removed and replaced

by others of different sizes, instead of changing the rollers themselves. The shaft of the fly-wheel A and pinion J are provided with a removable bearing by forming the journal-box in two pieces. The removable portion H forms the lower half of the journal-box. It is lined with Babbitt-metal and provided with a set-screw, *h*, for tightening it when necessary. It can be readily removed and the lining renewed, when necessary, by removing the pinion J and withdrawing the shaft and loosening the set-screw. The pinion J is secured to the inner end of the fly-wheel shaft by a pin or key, and the fly-wheel, when in place, prevents the displacement of the removable bearing or half-box H. The set-screw *h* is for the purpose of loosening the bearing if too tight, or tightening it when the Babbitt-metal lining becomes worn. By removing the pin or key which secures the pinion and withdrawing the fly-wheel shaft the half-box can be readily removed. The main driving-shaft K is protected by a casing, L, extending around it in such a manner as to greatly strengthen the shaft and protect the journals from dust and dirt. It has a slot formed on the under side, through which any dust which may enter the journals can be removed. This casing is cast in one piece with and forms part of the frame-work which supports the front end of the trough.

The power is applied to the shaft K and communicated to the machine through the bevel-wheel I at one end and pulleys M at the other end. The pulleys M are attached to the shaft

in the same manner as the pulleys G<sup>1</sup> G<sup>2</sup> before described, and are made in different sizes, for the purpose of changing the motion of the feed-rollers. When desired, a pinion, pawls, and ratchets are substituted for the pulleys M G<sup>1</sup> G<sup>2</sup> for communicating motion to the feed-rollers.

The frame-work which supports the front end of the trough is cast in one piece of metal, in such form as to include the sockets S for the front legs, the receptacle for the journal-box H, the journals for the lower feed-roller E<sup>1</sup>, the journals and casing for the shaft K, a receptacle for the bed-knife D, and to constitute strengthening-braces for the sides and bottom of the trough.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The half-box or removable bearing H, lined with Babbitt-metal and provided with a set-screw, *h*, for adjusting it, said removable bearing being arranged in a receptacle in the trough-supporting frame and held in place by the fly-wheel A, all as herein shown and described.

2. The frame-work supporting the trough, when so constructed as to include in one piece the sockets S for the legs, the receptacle for the half-box H, the journals and casing for the shaft K, and a receptacle for the bed-knife D, all as herein shown and described.

B. F. GRIMES.

Witnesses:

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