M. F. WILLIAMS.

STIRRUP HAMMER.

APPLICATION FILED MAY 17, 1918.

1,396,983. Patented Nov. 15, 1921.

Fig. 2.

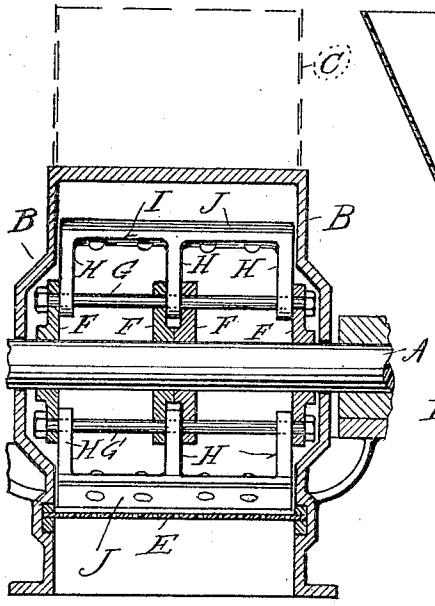



Fig. 1.

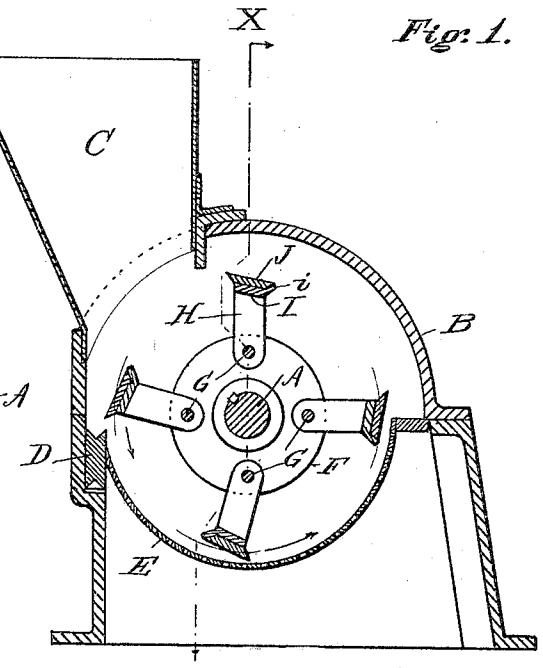
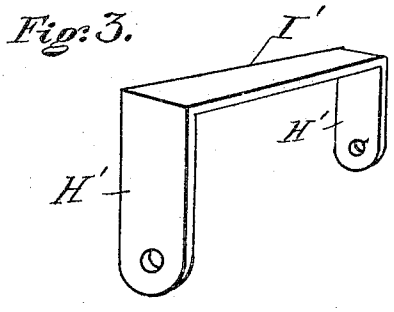



Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## STIRRUP-HAMMER.

1,396,983. Specification of Letters Patent. Patented Nov. 15, 1921.

Application filed May 17, 1918. Serial No. 235,093.

*To all whom it may concern:*

Be it known that I, MILTON F. WILLIAMS, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Stirrup-Hammers, of which the following is a specification.

This invention relates to certain new and useful improvements in stirrup hammers the peculiarities of which will be hereinafter described and claimed.

The object of my invention is to provide a pivoted stirrup hammer of simple and effective form having a cross bar head of comparatively small radial thickness adapted to pass through the feed material and presenting a wide working edge operating practically with minimum outlay of power.

In reducing rough feed stuff to coarse meal the cross bar head may have a sharp edge for corn stalks, etc., or may be comparatively dull as when made from a flat bar with ends bent down to form arms; but for this class of feed mill the rough stuff is more readily drawn into the hopper and reduced to coarse particles, by a head extending half or all the width of the casing and of thin dimension radially rather than thick,—the object with this hammer not being to pulverize, but to beat and cut up coarsely the feed material.

Referring to the accompanying drawing on which like reference letters indicate corresponding parts, Figure 1 represents a vertical sectional elevation of a grinder embodying my improvement, the section being taken across the axle; Fig. 2 a similar sectional view on the line X of Fig. 1, with the section parallel to said axle; and Fig. 3 a detailed view of the preferred simple form of stirrup hammer when operating on feed material that is to be reduced to "roughage" form of stirrup hammer of my construction adapted for making coarse meal or roughage.

The letter A designates the axle or shaft of a grinder comprising a suitable casing B, a hopper C, and suitable means such as cutter bar D and perforated cage E mounted in said casing, which means coact with stirrup hammers pivotally mounted on suitable hammer supports carried by said axle or shaft. These hammer supports preferably consist of disks F keyed to said shaft, the end disks being mounted in recesses in the sides of the casing as shown in Fig. 2, and in grinders having a considerable width, intermediate disks are used as shown in said figure. Through these disks are run hammer rods G, and on these rods are pivoted radial arms H, the outer ends of which are connected by a cross bar I of rectangular or other shape in cross section, but having a width several times its thickness (such as 2″ by $\frac{5}{16}$″ bar steel) and having such lesser dimension radially disposed with regard to the pivot point of the hammer, so that the head will pass through the material being operated on with comparatively little resistance, instead of opposing and beating up said material as would be the case if the head were oppositely disposed. The lesser resistance to passage of the head, and the consequent reduction of power for driving it, has been demonstrated by practical operation of such a hammer, and has created a wide demand for this style of stirrup hammer for feed machines reducing to roughage such material as velvet beans and stalk, peas and vines, and corn with cobs, as well as for cutting alfalfa and clover. A lip *i* may be formed on the back of the cross bar I to support and protect the rear edge of a sharp cutting plate J secured to said cross bar by rivets or otherwise when it is desired to operate on alfalfa hay, clover, and such material. A hammer without such cutting edge is provided by dispensing with cutter bar J, but the form shown in detail view Fig. 3 is preferred in such a case.

Thus not only is the air resistance lessened because of the open space next to the shaft, but the horsepower required to run the shaft at a high velocity is likewise much reduced. On account of this high velocity of rotation, the action of the cross bar in producing roughage or corn stover does not require a cutter bar and in some cases even the cage itself may be dispensed with, and the high angular velocity relied upon to draw in and break down the feed material. In cutting alfalfa hay or clover, the sharp cutting edge with the cutter bar works to best advantage. On the other hand in reducing snapped corn, which is ear corn with the husks on, Kafir corn in the head or stalks, bean vine, bean pods, peanuts in the pod or vines and all, a simpler form of hammer works to better advantage and such form is shown in Fig. 3. In this figure the arms H′ are two in number for hammers of comparatively short cross

bar I', and as the cutting blade is not used with this simpler form, the lip *i* is dispensed with on the cross bar.

In this form of stirrup hammer, whether with a sharp blade or with a blunt wearing edge on the cross bar, the action upon the entering feed is to draw it downward and inward and break it up into roughage, instead of shredding or cutting it into fine meal. This stirrup form of hammer likewise has the particular advantage of drawing in the feed, such as corn stalks, from the hopper into the casing, which hopper often has a tendency to clog up and choke; the husks do not accumulate in the hopper when the stirrup form of hammer is used.

I claim:

1. In a machine of the character described, a stirrup hammer constituting a flattened bar of a width several times its thickness, and consisting of a cross bar head having its lesser dimension radially disposed in order to present only said lesser dimension to the material being operated upon, and legs formed at each end of said head and having their width in the same direction as the head and thus presenting the lesser dimension of both head and legs to the material operated on, and thereby adapted to pass through such material with minimum resistance and consequent outlay of power.

2. In a comminuting machine of the stirrup hammer type, the combination of a casing having a screen bottom, a hopper, a cutting bar fixed to the casing below the inlet of the hopper to the casing, a central driving shaft carrying pivot means eccentric thereto, a slicing blade adapted to move downward close to said cutter bar fixed to the casing, said slicing blade being of a length substantially equal to that of the interior of the casing and having spaced radius arms projecting from its ends pivoted to said eccentric pivot means, the slicing blade being relatively wide and thin with its widest surface lying in a plane substantially tangential to its general surface of revolution, and the said radius arms being also relatively thin with their widest surfaces occupying radial planes, substantially as described.

In testimony whereof I have affixed my signature in the presence of two witnesses.

MILTON F. WILLIAMS.

Witnesses:

BESSIE RYAN,

MABEL WILLIAMS.