H. B. FORTNEY.

GRAIN OR HAY GRINDER.

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1,211,566.

Patented Jan. 9, 1917.

Fig. 1.

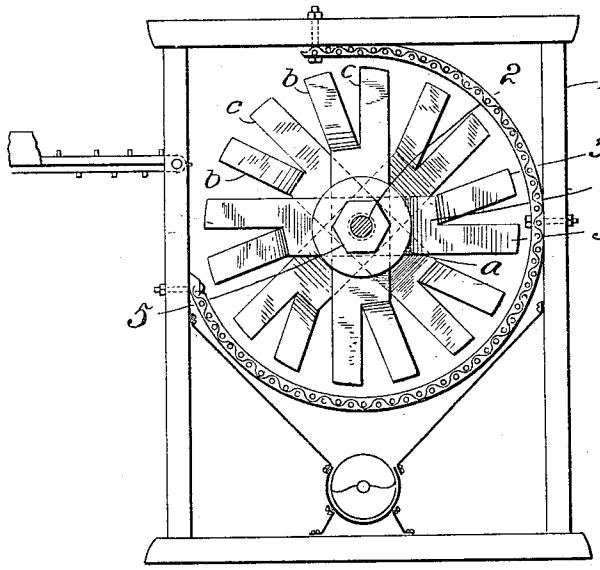


Fig. 3.

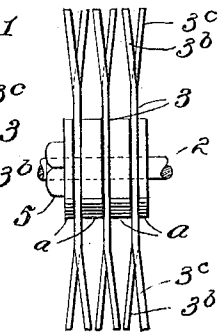
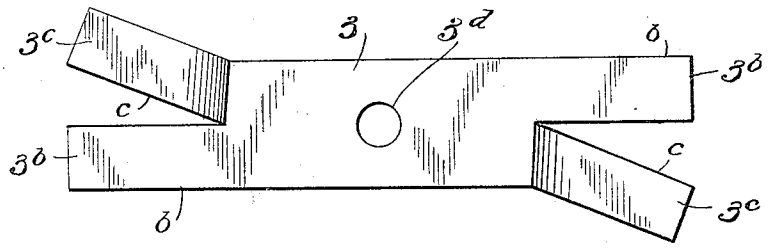


Fig. 2.



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UNITED STATES PATENT OFFICE.

HARVEY BENNET FORTNEY, OF HARTMAN, COLORADO.

GRAIN OR HAY GRINDER.

1,211,566. Specification of Letters Patent. Patented Jan. 9, 1917.

Application filed June 26, 1915. Serial No. 36,521.

To all whom it may concern:

Be it known that I, HARVEY BENNET FORTNEY, citizen of the United States, residing at Hartman, Colorado, have invented certain new and useful Improvements in Grain or Hay Grinders, of which the following is a specification.

My present invention relates to improvements in grain or hay grinder blades of the type in which a rotary shaft carries a plurality of grinder blades or bars which cooperate with either a fixed or an adjustable screen, and thereby grind up the hay, grain or other fibrous material into a finely divided condition.

The object of the invention is to provide grinder blades of an improved form, economical to manufacture and assemble and more efficient in use than those heretofore made.

In the drawing, Figure 1 shows a sectional end view of a frame or casing with the screen in section and my improved grinder within the same in elevation; Fig. 2 is a detail view of one of the blades; Fig. 3 is an edge view of several of the blades joined together.

Referring by reference characters to this drawing, the numeral 1 designates a frame or casing which may be of any suitable form or construction, and in which is journaled in suitable bearings a shaft 2 which carries the grinder elements 3. These grinder elements coöperate either with a fixed or adjustable concave screen surface 5, which is attached to the inside of frame, Fig. 1. The ground material may be collected in any suitable manner in a receiving chamber below, and removed by screw conveyer or fan blower through suitable pipe conductors. The hay or other material to be ground is fed by any suitable means, as by a conveyer 6, through an opening in the side or top of the casing, thus bringing it into contact with the grinding blades.

One of my improved grinding elements is shown more in detail in Fig. 2, and comprises a bar of sheet steel preferably about a quarter of an inch thick having an aperture 3^d in the center whereby a plurality of these bars may be threaded upon the carrying shaft, as indicated in Fig. 1. At each end the bar is provided with a pair of blades 3^b and 3^c which give a double cut and a differential grinding effect due to the relative shape and location of the blades; it being noticed that the cutting edges *b* are diametrically arranged with relation to the center of the shaft opening 3^d while the cutting edges *c* are offset with relation to a diameter passing through said center. A plurality of the blades, such as shown in Fig. 1, are mounted upon the shaft 2, suitably spaced by intervening spacing rings or washers *a*, Fig. 3, and held thereon by suitable clamping nuts 5^a, as indicated in Figs. 1 and 3, and coöperating with the concave screen 5 in the reduction of any fibrous material, or grain, into meal. These blades may be slightly concave in front for grinding dry fibrous material or reversed using the convex side for tough fibrous material or grain.

The grinding of the hay into meal is due primarily to the rapidity of the rotation of the cutting blades on the cylinder. These blades are not sharp, but have a square edge which increases their cutting capacity somewhat. Wet alfalfa, or alfalfa freshly cut full of sap, might double up across the edge of the blades and clog up the machine but this kind of material is never ground. The alfalfa is always in good condition before being ground; that is, it is either sun cured or stack cured. The reduction of alfalfa, hay or grain of any kind into meal or chop is done by the rapidly revolving blades beating the material against the concave screen surface until the reduction is such as to allow the meal to pass through the holes or mesh of the screen. In grinding alfalfa or other fibrous materials the passing of this material through the screen may be facilitated by using a fan which sucks the meal through always leaving a clean screen surface upon which to operate. However, in crushing grains such as corn, wheat, oats which have a greater specific gravity than alfalfa meal, the use of the fan is not necessary.

I secure very efficient results due to the shape of the blade which as shown gives the cutting points *b* on opposite faces of the blade while parts 3^e diagonally opposite extend beyond or overhang the line of the side of the blade. The part of the blade 3^b may also be slightly bent so that the blades diverge as shown in Fig. 3. The blades are rotated at a high rate of speed and cooperating with the concave screen produce a very evenly cut product.

The material to be ground is thrown into

the cylinder by a carrier and as it comes in contact with the blades it is thrown against the screen until beaten to the degree of fineness required to pass through the mesh. The roomy space between the blades where they have been split affords temporary storage for the unground material if the cylinder is overloaded.

This invention is an improvement upon the grinder shown in the patent of Wetterhold 999932 dated August 8, 1911.

Having thus described my invention what I claim is:

A double ended blade for grain or hay grinders having straight sides and with its ends split or divided, the divided ends being bent laterally in opposite directions, diagonally opposite sections of the divided ends extending beyond or overhanging the line of the sides of the blade, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

HARVEY BENNET FORTNEY.

Witnesses:
E. M. WILLIS,
R. E. NYE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."