

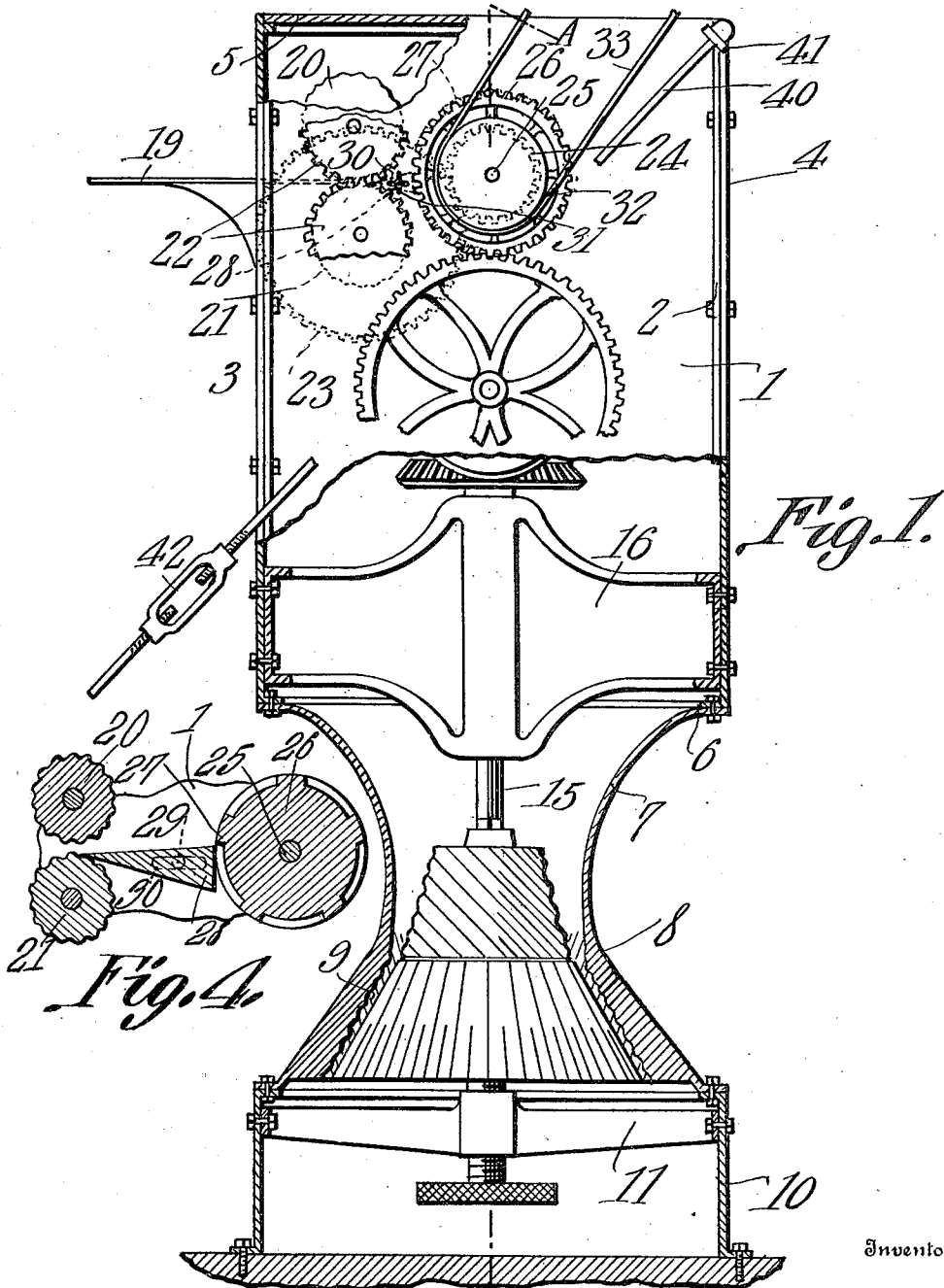
H. V. JOSEPH.
GRINDING MACHINE.

APPLICATION FILED FEB. 24, 1910.

Patented June 18, 1912.

2 SHEETS-SHEET 1.

1,030,186.



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UNITED STATES PATENT OFFICE.

HERSCHEL V. JOSEPH, OF DOXEY, OKLAHOMA.

GRINDING-MACHINE.

1,030,186.

Specification of Letters Patent.

Patented June 18, 1912.

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To all whom it may concern:

Be it known that I, HERSCHEL V. JOSEPH, a citizen of the United States, residing at Doxey, in the county of Beckham and State of Oklahoma, have invented a new and useful Grinding-Machine, of which the following is a specification.

This invention relates to machines for grinding feed, its object being to provide a simple and compact device of this character especially adapted to quickly reduce stalks, grain, etc., to a finely comminuted state, means being provided whereby the material supplied to the machine will be successively crushed, chopped and ground and discharged in a thoroughly mixed condition into any suitable receptacle provided therefor.

With these and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claim.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—Figure 1 is a view partly in side elevation and partly in section through the complete machine. Fig. 2 is a section on line A—B Fig. 1. Fig. 3 is a detail view of the fixed cutter bar. Fig. 4 is a transverse section through the crushing and chopping rolls and through the cutter bar located therebetween.

Referring to the figures by characters of reference 1 designates the side plates of the main casing the same being preferably provided along the front and rear edges with flanges 2 to which are bolted the front and rear plates 3 and 4 respectively of the casing. The top of the casing may, if desired, be provided with a closure 5. The bottom of the casing is open and provided with a flange 6 bolted or otherwise fixedly secured to the upper end of a hopper like discharge portion 7 merging into an inverted hollow frusto-conical grinding member 8 the inner surface of which is formed with a desired arrangement of grinding ribs, teeth or turns 9. This fixed grinding member is, in turn, bolted or otherwise secured upon the upper end of a supporting member 10 in which is located a diametrically disposed bar 11. A tubular bearing member 12 is screwed into this bar and extends upwardly therefrom, there being a head 13 upon the lower end of said member whereby it can be readily

manipulated. This member 12 is designed to receive the lower rounded end 14 of a shaft 15, the upper portion of which is journaled within a bearing member 16 extending from front to rear of the casing and bolted or otherwise secured to the plates 3 and 4. The said shaft has a squared portion 17 on which is slidably mounted a substantially conical grinding member 18 the working face of which is provided with burs, ribs or other suitable means for grinding material upon the fixed members 9. The grinding ribs upon the member 18 are closer together at the lower portion of the grinding member 18 than at the upper portion thereof and are pitched oppositely to the grinding devices on the fixed members 8. The two grinding faces of the members 8 and 18 are also equally spaced apart but the upper portion of the grinding member 18 gradually diverges upwardly from the discharge member 7 as clearly indicated in the drawings.

The grinding member 18 bears downwardly on the adjusting member 12 and it will be apparent therefore that by rotating the said member 12 the grinding elements 18 can be shifted upwardly on the squared portion 17 of the shaft 15 so as to bring it closer to the grinding member 8.

A feed table 19 extends into the front end of the casing adjacent the top thereof and serves to direct material to the pass formed between upper and lower crushing rolls 20 and 21 the faces of which are preferably corrugated. Gears 22 are secured to these rolls and are preferably located outside of the casing, the two gears meshing so as to cause the rolls to positively rotate in opposite directions.

A large gear 23 is secured to one of the rolls preferably the lower roll 21 and is adapted to receive motion from a gear 24 which is secured to a shaft 25 extending transversely through the casing. A chopping roll 26 is secured to the shaft and within the casing and has a series of spirally arranged shearing ribs 27 designed to operate with a relatively fixed cutter bar 28 which is arranged transversely within the casing. This bar is preferably triangular in cross section and has trunnions 29 extending from its ends, and mounted within slots 30 formed within the sides of the casing. Any suitable means, such as wing nuts 31, may be mounted on the trunnions

for the purpose of clamping the bar in any position to which it may be adjusted. The upper surface of the bar serves to direct material from the pass between the rolls 20 and 21 to the chopping roll 26, the upper edge of the bar constituting the stationary shearing element with which the ribs 27 co-operate.

A pulley 32 may be secured to the shaft 25 and driven by a belt 33 and a gear 34 is preferably secured to the shaft 25 and meshes with a gear 35 secured to a shaft 36 which extends transversely through the casing and is journaled in the sides thereof. A gear 37 is secured to this shaft 36 and meshes with a gear 38 secured to the upper end of the shaft 15. A shield 39 is preferably mounted above the gears 37 and 38 so as to prevent them from becoming clogged by material falling downward from the chopping roller 26.

If preferred, and as shown in the drawings, the casing can be braced by means of rods 40 connected at their upper ends to ears 41 extending laterally from the casing, it being designed to anchor the lower ends of these rods in any preferred manner and each of the rods being preferably provided with a turn buckle 42 or the like whereby they can be readily tightened. By utilizing these rods the casing is prevented from becoming strained or otherwise injured as the result of the constant pull exerted by the belt 33.

After the various parts have been set in motion the material to be ground is placed on the table 19 and moved toward the crushing rolls 20 and 21. These rolls will engage the material and crush it as it travels through the pass between them and onto the bar 28. The material will be forced along the bar and will be engaged and cut or chopped by the ribs 27 passing the bar. The cut particles will fall downwardly within the casing and into the discharge portion 7 which will direct them into posi-

tion around the movable grinding member 18. This member as it rotates forces the material against the fixed grinding surface 9 and the material is gradually worked downward between the revoluble and fixed grinding members until it is finally discharged into the supporting structure 10 in the form of a finely divided mass. As has heretofore been pointed out, the movable grinding element can be shifted toward or away from the fixed grinding element by manipulating the tubular member 12. In this way the fineness of the product can be regulated.

It is to be understood of course that various changes may be made in the construction and arrangement of the parts without departing from the spirit or sacrificing any of the advantages of the invention as defined in the appended claim.

What is claimed is:—

A grinding mill including a chopping roll mounted for rotation and having spiral shearing ribs, crushing rolls, a casing housing the rolls and having opposed slots, a cutter bar triangular in cross sectional contour, the flat upper and lower faces of the bar converging to an edge located within the pass between the crushing rolls, said bar being reversible to bring either of said faces uppermost, the third longitudinal face of the bar coöperating at all times with the ribs on the chopping roll, trunnions extending from the ends of the bar and shiftable longitudinally of the slots in the housing, and means engaging the trunnions and outside of the casing for holding the bar against movement longitudinally of the slots.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HERSCHEL V. JOSEPH.

Witnesses:

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