No. 733,454. PATENTED JULY 14, 1903.

J. S. BLOOM.

MACHINE FOR CUTTING AND CRUSHING CORN.

APPLICATION FILED JAN. 22, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

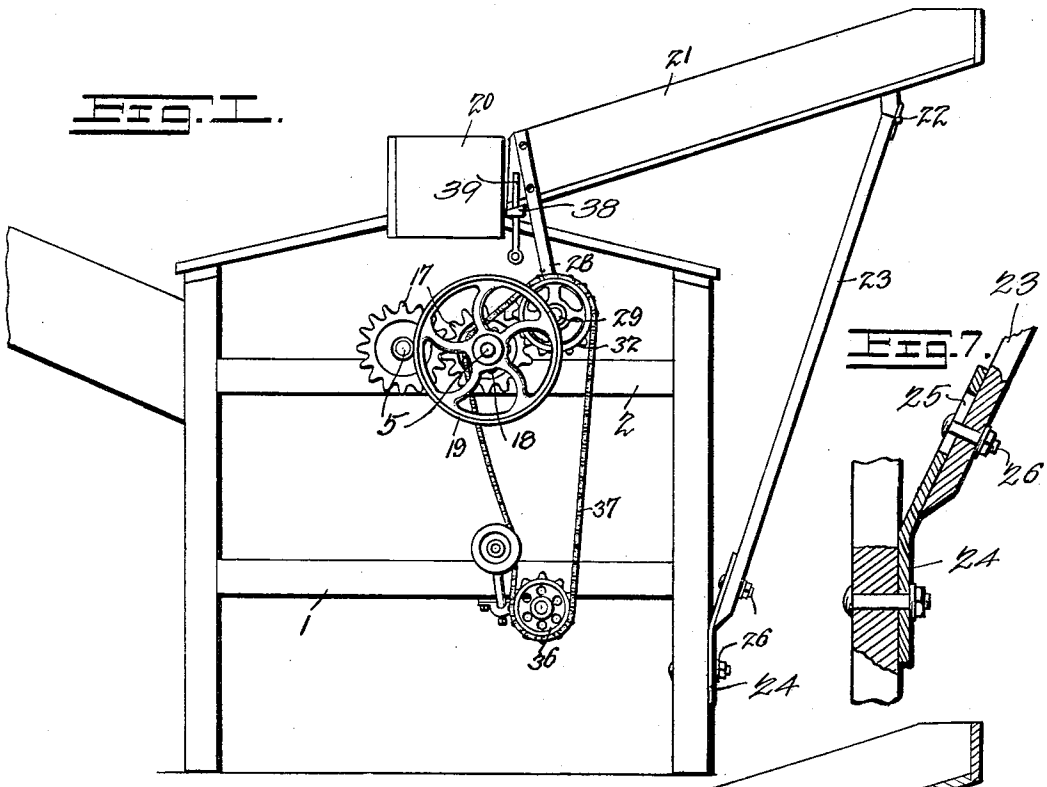
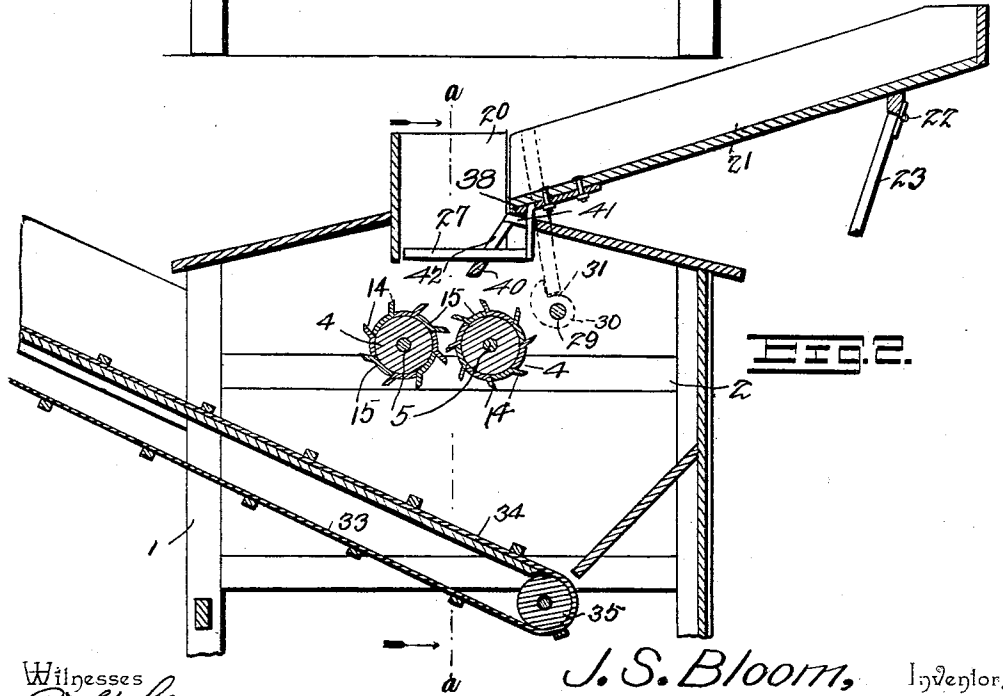


Fig. 7.

Fig. 2.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

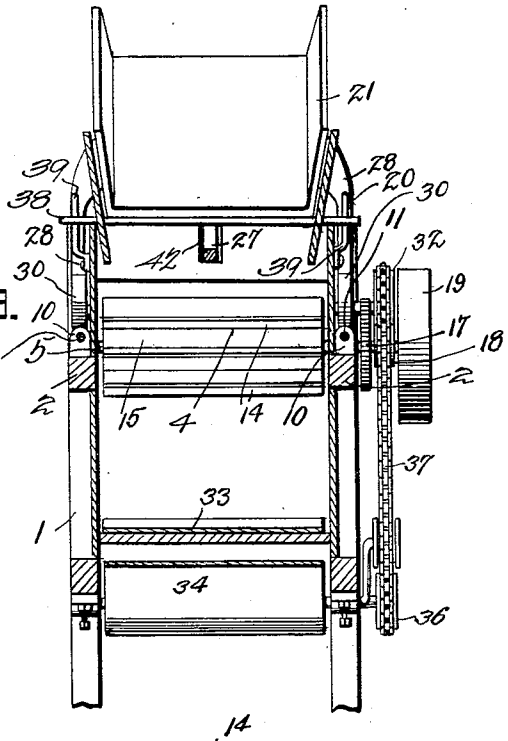


Fig. 4.

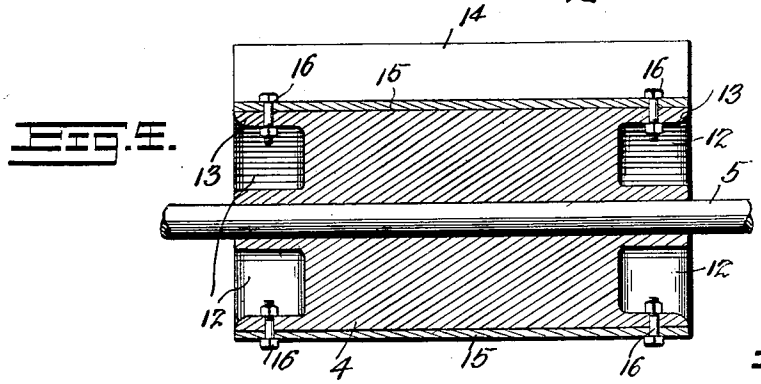


Fig. 5.

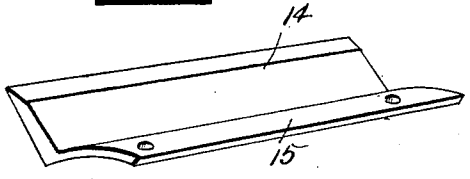
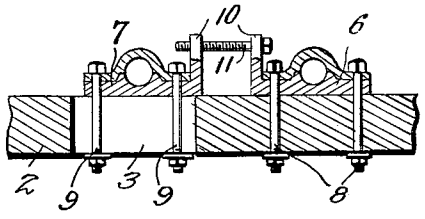


Fig. 6.



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No. 733,454. Patented July 14, 1903.

UNITED STATES PATENT OFFICE.

JOHN S. BLOOM, OF WINTHROP, IOWA.

MACHINE FOR CUTTING AND CRUSHING CORN.

SPECIFICATION forming part of Letters Patent No. 733,454, dated July 14, 1903.

Application filed January 22, 1902. Serial No. 90,834. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. BLOOM, a citizen of the United States, residing at Winthrop, in the county of Buchanan and State of Iowa, have invented a new and useful Machine for Cutting and Crushing Corn, of which the following is a specification.

My invention is an improvement in machines for crushing and cutting corn, and particularly upon the corn crusher and cutter for which Letters Patent of the United States No. 680,755 were granted to me August 20, 1901.

One object of my present invention is to effect improvements in the means for adjusting the crushing and cutting cylinders toward and from each other.

A further object is to effect improvements in the construction of the crushing and cutting cylinders.

A further object is to effect improvements in the means for feeding the corn endwise to the crushing and cutting cylinders.

With these and other objects in view my invention consists in the peculiar construction and combination of devices hereinafter fully set forth and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a corn crushing and cutting machine embodying my improvements. Fig. 2 is a vertical longitudinal sectional view of the same. Fig. 3 is a vertical transverse sectional view of the same, taken on a plane indicated by the line *a a* of Fig. 2. Fig. 4 is a detail longitudinal sectional view of one of the crushing and cutting cylinders. Fig. 5 is a detail perspective view of one of the blades of said cylinders. Fig. 6 is a detail sectional view of one pair of the bearings in which the crushing and cutting cylinders are journaled. Fig. 7 is a similar view of the adjustable support for the outer end of the feed-trough.

The frame 1 may be of any suitable construction and is here shown as provided on opposite sides with a pair of bars 2. The said bars are provided with vertical longitudinal slots 3 of suitable length near the central portions of the said bars. The crushing and cutting cylinders 4 have their shafts 5 journaled, respectively, in bearings 6 7, which are here shown as secured on the upper sides of the bars 2 by bolts 8 9, respectively. The bolts 9 of the bearings 7 pass through and operate in the slots 3, and it will be understood that the bearings 7 are adjustable, and hence the cylinder which is mounted in the said bearings may be adjusted toward or from the counter-cylinder. The said bearings 6 7 are provided at their inner opposing ends with standards 10, and the said bearings are connected together in pairs on opposite sides of the machine by adjusting-bolts 11, as shown in Fig. 6. By turning the said adjusting-bolts the said adjustable standards 7 may be moved, as may be required, to dispose the crushing and cutting cylinders at any desired distance apart. It will be understood that prior to adjusting the bearings 7 the nuts on the bolts 9 must be loosened and that the same must be retightened after said bearings have been adjusted.

The crushing and cutting cylinders 4 are preferably made of iron or steel and are annularly chambered at their ends, as at 12, to form the end flanges 13. The blades 14 of the crushing and cutting cylinders are separable therefrom and from each other and are of the form shown in Fig. 5, each of the said blades being formed at its inner side with a segmental section 15, the inner side of which corresponds to the radius of the cylinder on which it is secured by the bolts 16, which are fitted in openings near the ends of the sections 15 and in the flanges 13 of the cylinder. The said blades 14 are disposed tangentially on the cylinders, and the blades of the respective cylinders are intercurrent.

The shafts 5 of the crushing and cutting cylinders are provided at one end with spur-wheels 17, which intermesh. The shaft of the relatively fixed non-adjustable cylinder is further provided with a sprocket-wheel 18 and with a power-pulley or other suitable device 19, by which power may be communicated thereto. It will be understood that the cylinders rotate in reverse directions, as indicated by the arrows in Fig. 2, and that the same serve to cut and crush ear-corn which is fed thereto and which passes between them.

On the upper side of the frame 1, above the crushing and cutting cylinders, is a bottomless hopper 20 of suitable construction. A feed-trough 21 has its outer portion hinged or

pivotally connected, as at 22, to the upper end of a support 23. The said support has a depending shoe 24 at its lower end provided with a vertical slot 25. The said shoe is bolted to one side of the frame or casing of the machine and is secured to the support 23 by a bolt 26, which engages the slot 25. Hence the support 23 is vertically adjustable to incline the feed-trough to any desired angle. The inner end of the feed-trough is free and is disposed in and discharges into one side of the hopper 20. An ear-turning bar 27 is connected to the inner end of the feed-trough and extends transversely across the central portion of the bottomless hopper 20. The said ear-turning bar serves to turn the ears of corn as the same are fed to the machine in such manner as to cause them to be fed endwise to the coacting corn crushing and cutting cylinders, as will be understood. Tappets 28, one or more, are secured to the inner portion of the feed-trough and depend therefrom. A shaft 29 is journaled in bearings in the frame 1 and is provided with cams 30, which have shoulders or offsets 31. The said cams being rotated by the said shaft and the tappets 28 being in engagement with the said cams, it will be understood that the action of the cams and tappets is such as to alternately raise and drop the inner feed end of the trough, and thereby shake the corn in the trough and facilitate its passage therethrough. The shaft 29 has a sprocket-wheel 32 at one end.

As here shown, a conveyer 33 is employed in connection with the corn crushing and cutting machine to convey the product therefrom as it is discharged by the crushing and cutting cylinders. The conveyer may be of any preferred type and is here shown as comprising an endless traveling belt 34. The roller 35, which operates the said belt, has a sprocket-wheel 36 at one end of its shaft, and an endless sprocket-chain 37 connects and engages the sprocket-wheels 18, 32, and 36, and hence power is conveyed from the power-shaft to the cams which operate the feed-trough, and the conveyer which discharges the crushed and cut corn from the machine.

To the under side of the feed-trough 21 at its inner end is secured a transversely-disposed guide-bar 38, the ends of which project beyond the sides of the feed-trough and are provided with openings. Guide-rods 39 have their lower ends secured to the sides of the machine. The upper portions of said guide-rods are disposed in the openings in the guide-bar, and thereby the inner end of the feed-trough while permitted to move vertically by the operation of the cams and tappets is retained in the open side of the hopper. The latter has a laterally-inclined board 40, which is secured to and connects the ends of the hopper, is disposed under the vertically-movable inner end of the feed-trough, and contracts the throat of the hopper, as shown in Fig. 2. The ear-turning bar operates in an opening 41, which is mortised in the top of the casing of the machine at the open side of the hopper and in a vertical slot 42 in the board 40.

Having thus described my invention, I claim—

In a machine of the class described, the combination with a casing, of a feed-hopper disposed in the top of said casing and having an open side, crushing and cutting rollers disposed transversely beneath said hopper, a guide-board depending from the casing of the hopper between said rollers, an inclined feed-trough having its outer end pivotally and adjustably supported outside of and independently of the hopper and having its inner end disposed to discharge into the hopper through the open side of the latter and above the downwardly-extending feed-board, alined slots in the latter and in the top of the casing, a bracket secured to the under side of the feed-trough and extending downwardly through the slot of the top casing, a dividing-bar extending forwardly from said bracket through the slot in the inclined feed-board, and means for imparting to the feed-trough a vibratory motion.

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

JOHN S. BLOOM.

Witnesses:
W. B. MILLER,
R. H. MEFFERT.