J. L. GIBSON.

FEED CRUSHER.

APPLICATION FILED NOV. 25, 1907.

923,966. Patented June 8, 1909.

3 SHEETS—SHEET 1.

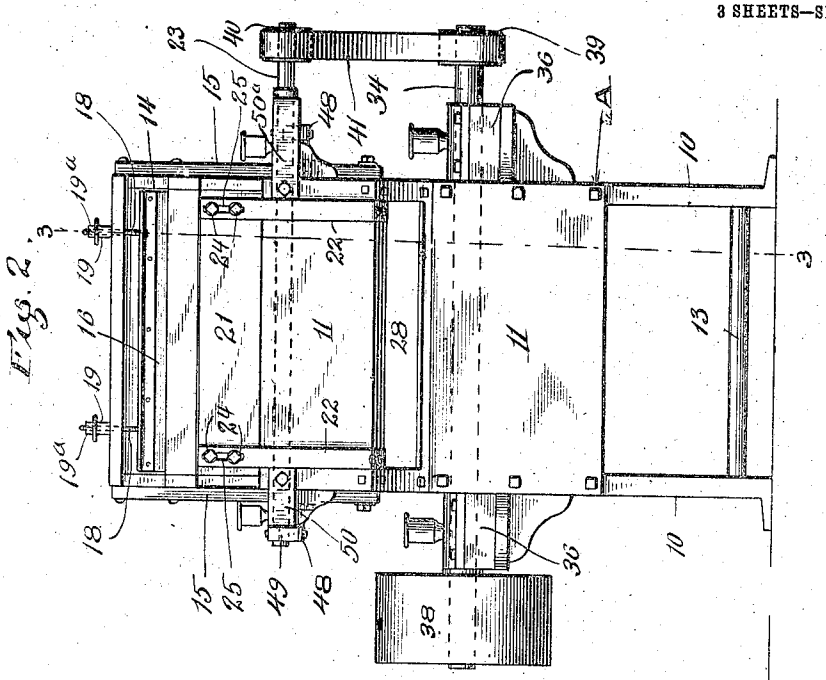


Fig. 2.

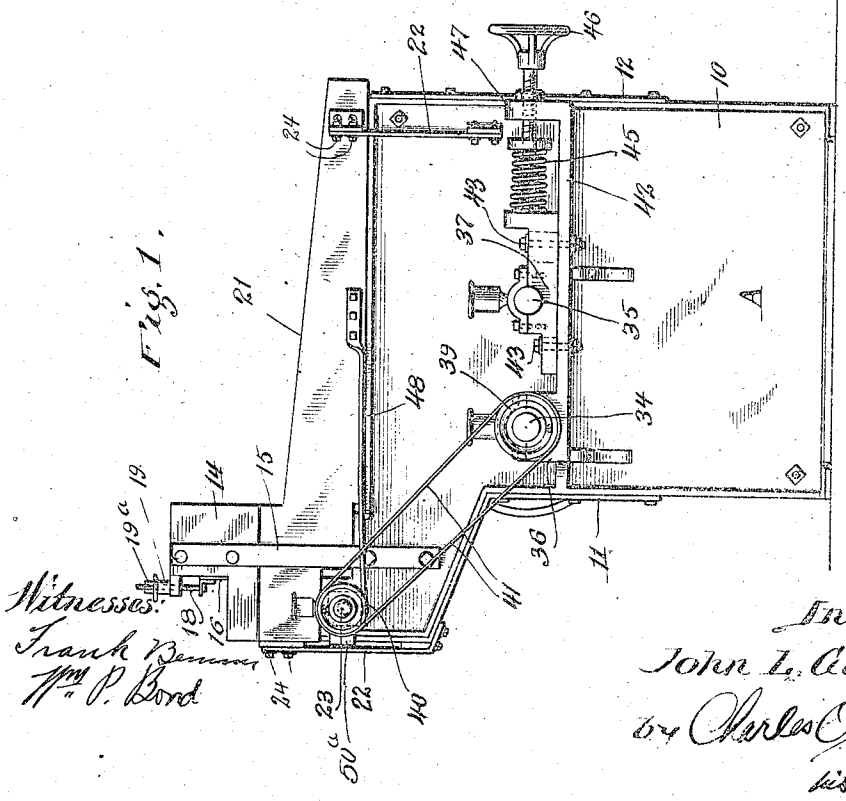


Fig. 1.

Witnesses:
Frank Benner
Wm. P. Bord

Inventor:
John L. Gibson,
by Charles O. Shirley
his atty.

J. L. GIBSON.

FEED CRUSHER.

APPLICATION FILED NOV. 25, 1907.

923,966.

Patented June 8, 1909.

3 SHEETS—SHEET 2.

Fig. 4.

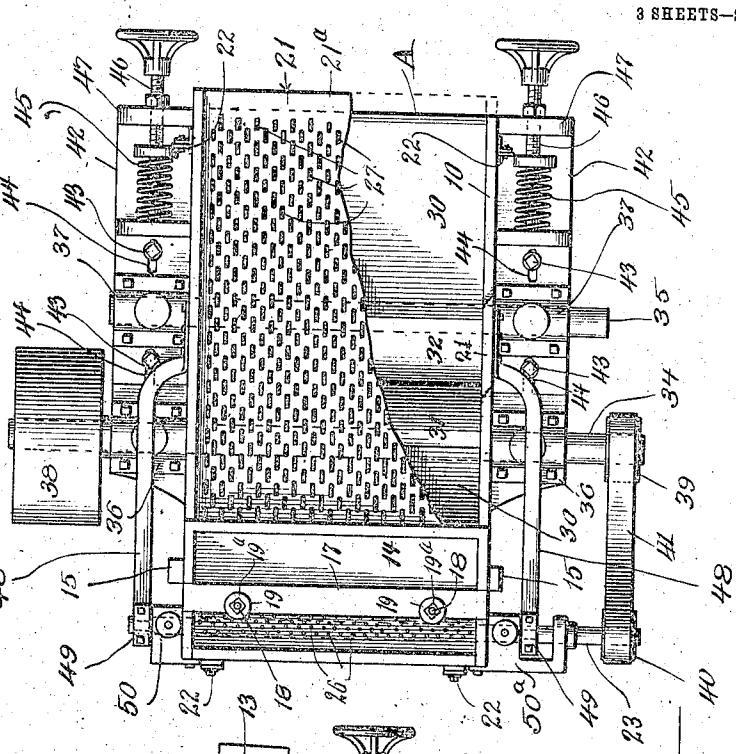
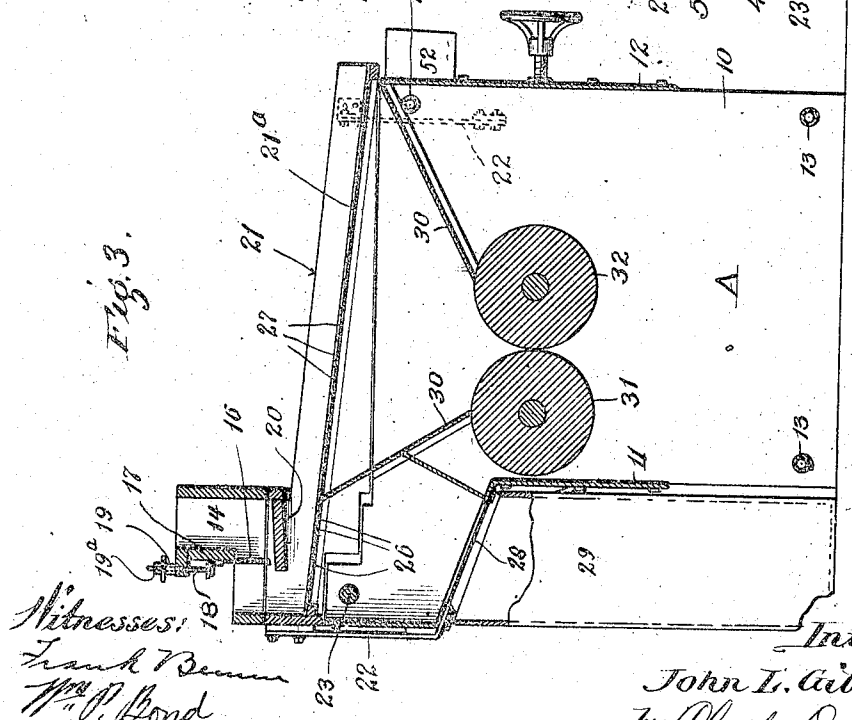


Fig. 3.



Witnesses:
Frank T. Brown
Wm. O. Bond

Inventor:
John L. Gibson,
by Charles A. Sherwy
his Atty.

J. L. GIBSON.

FEED CRUSHER.

APPLICATION FILED NOV. 25, 1907.

923,966.

Patented June 8, 1909.

3 SHEETS—SHEET 3.

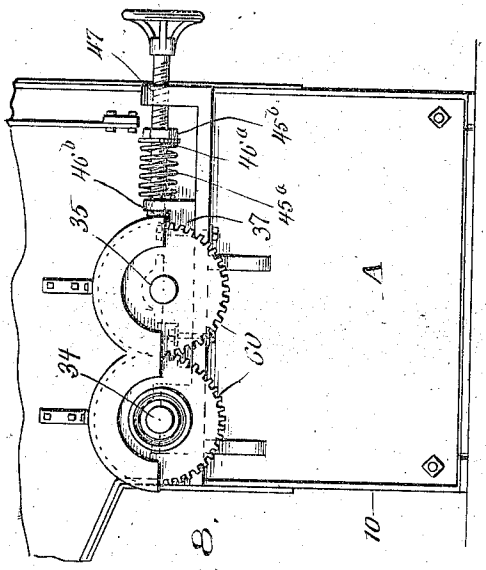
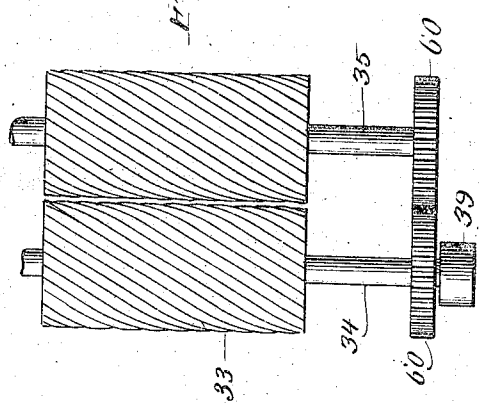


Fig. 8.

Fig. 9.



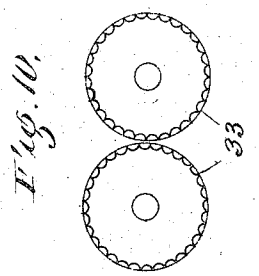


Fig. 10.

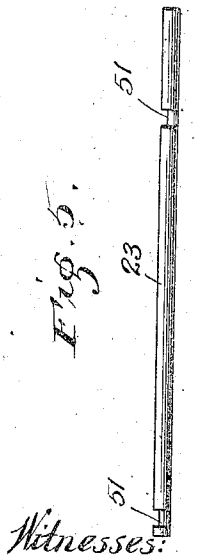


Fig. 5.

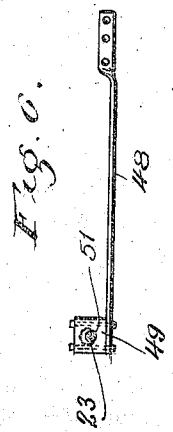


Fig. 6.

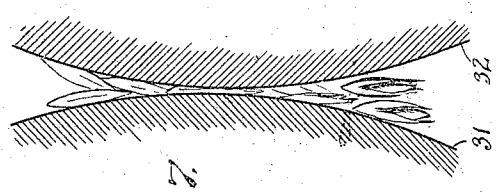


Fig. 7.

Witnesses:
Frank Benner
Wm. P. Bond

Inventor:
John L. Gibson,
by Charles O. Shewey
his Atty.

UNITED STATES PATENT OFFICE.

JOHN L. GIBSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO GIBSON OAT CRUSHER CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FEED-CRUSHER.

No. 923,966. Specification of Letters Patent. Patented June 8, 1909.

Application filed November 25, 1907. Serial No. 403,645.

To all whom it may concern:

Be it known that I, JOHN L. GIBSON, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Feed- Crushers, of which the following is a full, clear, and exact description.

My invention relates to improvements in feed crushers.

The object of this invention is to provide a machine for crushing or cracking open oats, barley, wheat, corn and the like so as to expose the interior. It is highly desirable that feed of this kind be thus prepared in order that animals, to which feed such as for instance oats or corn, is given, shall receive the greatest amount of nutrition from the feed. It is also of importance that the feed be merely cracked or crushed and not "floured" or ground into meal and one of the objects of this invention is to provide a crusher which does not grind the grain, but merely crushes it so as to break the grain open.

Another object is to provide a crusher which will operate upon grain that has not been previously cleaned, and for this reason I have provided means for separating the dust and foreign articles such as nails, straw, sticks or the like from the grain, so that nothing but the latter may be acted upon, whereby the machine will deliver cleaned and crushed grain.

To these ends the invention consists in certain novel features of construction and arrangement, and novel combinations of parts, a description of which will be found in the following specification and the essential features of which will be more definitely pointed out in the claims.

The invention is clearly illustrated in the accompanying drawings in which—

Figure 1 is a side view of a crusher embodying my improvements. Fig. 2 is an end view thereof. Fig. 3 is a longitudinal section taken on line 3—3 Fig. 2. Fig. 4 is a plan view with certain parts broken away. Fig. 5 is a side view of an eccentric shaft. Fig. 6 is a side view of an eccentric block and vibrator arm. Fig. 7 is a diagrammatical view of the crushing rolls showing their action upon the grain. Fig. 8 is a fragmental side view of a modified form of construction. Fig. 9 is a plan view of the rolls used in said modified form and Fig. 10 is an end view of said rolls.

Referring to the drawings A is a frame of which 10 are side plates, that are connected at the front and rear by end plates 11, 12, to provide a box like frame upon which the operating parts of the machine are mounted. Struts 13, are also provided to further strengthen and reinforce the frame thus formed.

A receiving hopper 14, is supported above the front end of the frame by arms or standards 15, which are bolted or otherwise secured to the sides of the frame A and hopper 14 as shown. An adjustable gate 16 is supported in the hopper which gate regulates the flow of grain from the hopper to the crusher, and said gate is supported upon a wall 17 of the hopper by bolts 18, and nuts 19—19ª. It is preferably obvious that the gate can be raised or lowered by turning the nuts upon the bolts, and that the flow of grain can thus be regulated at will.

A shaking or vibratable screen or sieve 21 is arranged between the hopper and frame A and is connected to the latter by arms 22. The arms are bolted to the screen and frame and an adjustable connection is afforded by means of bolts 24 and slots 25. The screen 21 contains a shelf 20, which acts as a bottom for the hopper 14, but moves with the screen. The screen also contains a perforated inclined sieve plate 21ª which has a series of small perforations 26 through which fine particles such as dust may escape, and these perforations are arranged immediately below the hopper 14, so that the dust may escape from the grain before the latter reaches the large perforations 27. The dust falls through an opening 28, in the end plate 11, and into a suitable receptacle 29. The screen is vibrated by two arms 48 which are secured to the sides of the screen and are connected to eccentric blocks 49, that are mounted upon an eccentric shaft 23 which is driven by the main drive shaft of the machine. The shaft 23, is journaled in bearings 50—50ª which are carried by the frame A and said shaft has two eccentric portions

51 that operate the blocks 49. (See Figs. 5 and 6.)

Immediately below the large perforations 29 are hopper plates 30 which convey the grain upon the crushing rolls 31, 32. For crushing oats, barley, wheat etc. these rolls are preferably smooth rolls, but for cracking corn they should be fluted or corrugated as seen at 33 in Figs. 9 and 10. The rolls are mounted upon shafts 34, 35, which are journaled in boxes 36, 37, that are secured upon the side plates 10. The shaft 34 is the drive shaft and bears a pulley 38 upon one end, by means of which the machine may be belted to any suitable source of motive power. A pulley 39 is mounted upon the other end of the shaft 34, and belted to a pulley 40 upon the shaft 23, by a belt 41.

The boxes 37 are adjustably mounted upon flanges or ledges 42 by means of bolts 43 and slots 44, the bolts passing through the slots 44 and ledge 42. Pressure springs 45 are employed to press the roll 32 toward the roll 31. The springs bear upon one end of the boxes 37 and the tension of said springs is regulated by regulating screws 46 which are threaded in lugs 47 that project up from the ledges 42.

The form illustrated in Figs. 8 to 10 inclusive is especially adapted for cracking open corn. In this form the rolls 33 are fluted or corrugated so as to present ridges or edges which bite into the corn and crack it open to expose the interior thereof. The rolls in this case are geared together by gear wheels 60, which are mounted upon the shafts of the rolls and intermesh with each other.

The adjusting screws 46^a engage the boxes 37, by means of heads 46^b, but said boxes are free to move back and forth upon said screws. Tension springs 45^a are confined between the boxes and nuts 45^b threaded upon the adjusting screws 46^a and hold the boxes against the heads 46^b. The tension upon the roll is regulated by the nuts 45^b. By turning the screws in the proper direction, the movable roll can be moved toward or away from the other one. In this manner the rolls can be properly spaced to operate upon the corn as it falls upon the rolls. The quantity of corn falling upon the rolls, being first regulated by the gate 16, the rolls can be so adjusted that they will crack open the corn without grinding it into meal.

The operation of the machine is as follows: The grain is fed into the hopper usually by means of a chute (not shown) and the grain flows out through the opening between the gate 16 and shelf 20 of the screen in a uniform stream and falls upon the sieve 21^a. The dust drops through the fine holes in the upper end of the sieve and the grain flows down the sieve, and through the perforations 27 therein and upon the hopper plates 30, which convey it to the crushing rolls 31, 32. Large particles which cannot pass through the perforations will roll down and eventually fall off the sieve into a receptacle 52. The grain being fed upon the sieve in an even stream consequently falls upon the rolls in a continuous even stream, and passes between the rolls and is crushed or cracked open in its passage between them. When starting the machine the operator inspects samples of the crushed grain, as it comes from the rolls, and adjusts the tension of the springs on the roll 32, so that the pressure will be proper to crush that quantity of grain which is passing through the rolls without grinding it, and when this tension is properly adjusted the machine requires no further attention except of course such as is necessary to keep it in running order.

It is to be observed that the two rolls run at an equal speed, that is to say, their peripheral speed is equal, the result being that the grain is crushed between the rolls and not ground. If one roll were to travel at a greater speed than the other, a grinding effect would result and this is particularly undesirable in preparing the grain for feeding purposes.

I claim as new and desire to secure by Letters Patent—

1. A crusher for uncleaned feed, comprising an inclined vibratory separating screen, having fine perforations at its upper end, and coarse perforations beyond the fine perforations, a pair of suitably driven rolls, a receiving hopper having a discharge opening located above the fine perforations, and a second hopper located wholly below the screen for delivering the separated feed to the rolls, and having a wall which extends to the point of separation between the fine and coarse perforations, substantially as and for the purpose set forth.

2. A crusher for uncleaned feed, comprising an inclined separating screen having fine perforations at its upper end and coarse perforations beyond the fine perforations, flexible arms carrying said screen, a receiving hopper having a regulatable discharge opening located above the fine perforations, a pair of crushing rolls having an equal peripheral speed located below the screen, stationary bearings for one of the rolls, movable bearings for the other roll, adjustment means for yieldingly limiting movement of the movable bearings away from the stationary bearings, whereby the amount of separation of the rolls may be varied according to the quantity of feed which is to be operated upon by the rolls, a second hopper located wholly below the screen for delivering the separated feed to the rolls and having a wall which extends to the dividing line

between the fine and coarse perforations, a pulley connected with the stationary roll, a shaft having an eccentric near each end, a pulley upon said shaft, an arm connecting each eccentric with the screen and a belt connecting the pulleys.

In witness whereof I have executed the above application at Chicago, Ill. this 5th day of November 1907.

JOHN L. GIBSON.

Witnesses:
J. H. COOMBS,
CHARLES O. SHERVEY.