(No Model.) 3 Sheets—Sheet 1.

R. G. JENCKES.

HOMINY MILL.

No. 504,784. Patented Sept. 12, 1893.

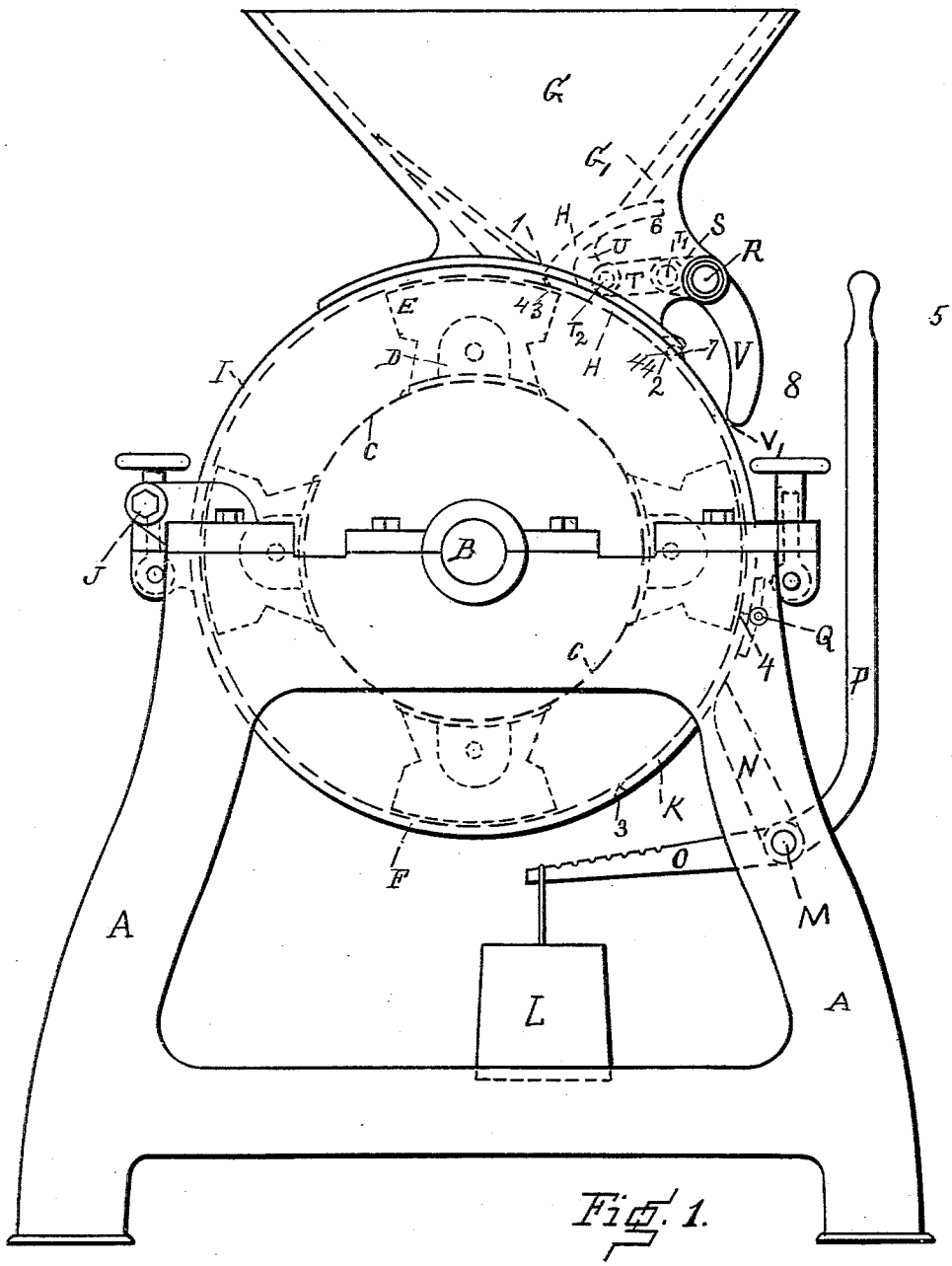

Fig. 1.

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No. 504,784. Patented Sept. 12, 1893.

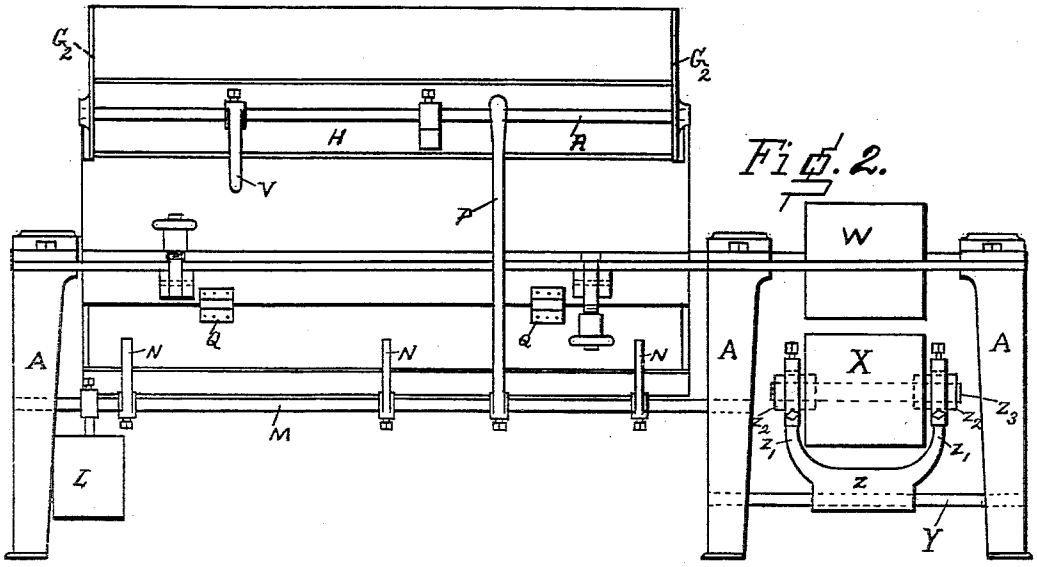

Fig. 2.

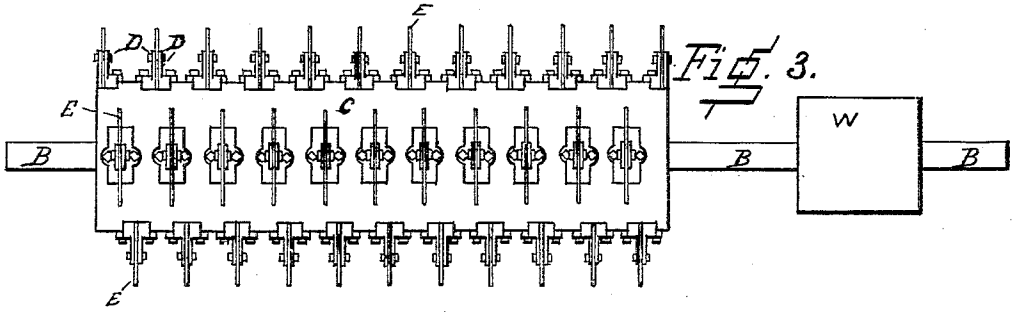

Fig. 3.

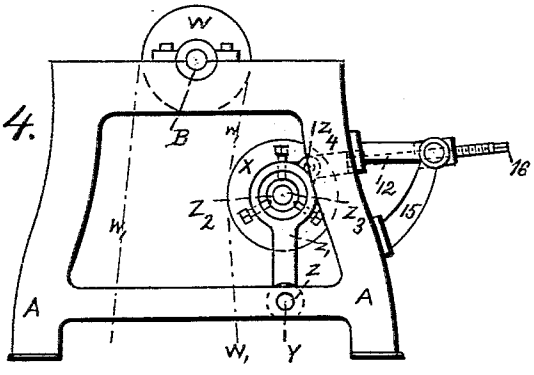

Fig. 4.

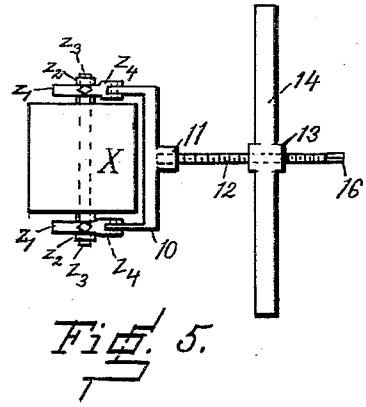

Fig. 5.

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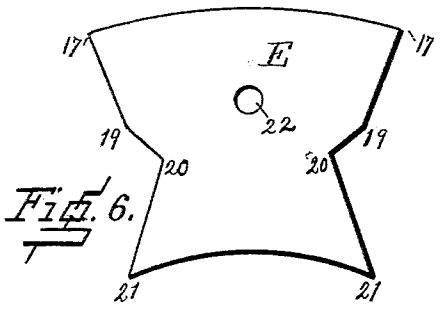

Fig. 6.

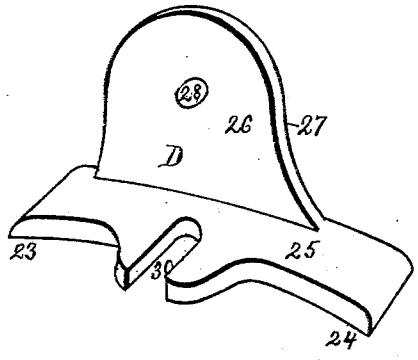

Fig. 7.

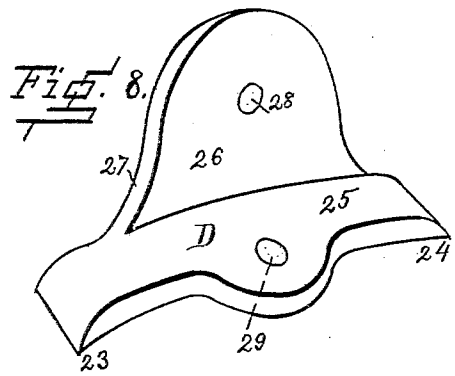

Fig. 8.

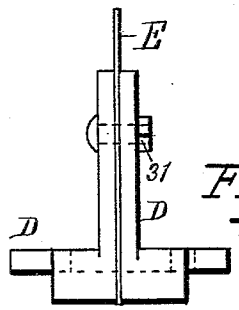

Fig. 9.

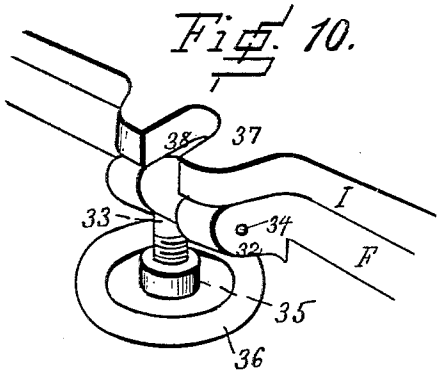

Fig. 10.

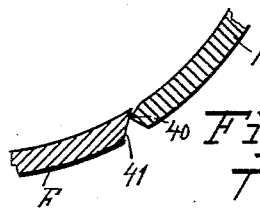

Fig. 11.

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UNITED STATES PATENT OFFICE.

RAY G. JENCKES, OF TERRE HAUTE, INDIANA.

HOMINY-MILL.

SPECIFICATION forming part of Letters Patent No. 504,784, dated September 12, 1893.

Application filed January 23, 1893. Serial No. 459,462. (No model.)

To all whom it may concern:

Be it known that I, RAY G. JENCKES, a citizen of the United States, residing at Terre Haute, in the county of Vigo and State of Indiana, have invented a new and useful Hominy-Mill, of which the following is a specification.

My invention relates to that class of machines in which a charge of shelled corn is acted on by rotary driven knives in such a manner, that the grains of corn are broken, and the outside of the grain or husk separated from the remainder of the grain by the combined action of the knives on the grains, the friction of the grains with each other, and the heat generated by the two actions named. The broken grains of corn from which the husk or covering has been removed form a product known as hominy, and the machine which makes this product is known as a hominy mill, by which name it will be referred to throughout this specification.

The mechanism by means of which I obtain the actions above described, and which constitutes my hominy mill, is illustrated in the accompanying drawings, in which similar letters and numerals refer to similar parts throughout all the figures.

Figure 1 is a general end elevation, the view being taken from the end opposite the driving pulley, and not showing either the driving pulley or belt tightener. Fig. 2 is a general front elevation showing the driving pulley W, idler pulley X and a portion of the belt tightening device. Fig. 3 shows the main driving shaft B, the driving pulley W, the cylinder C fitted to revolve with the main shaft B, the knife lugs D, and knives E. Fig. 4 is an end elevation of a portion of the hominy mill illustrating the belt tightening device. Fig. 5 is a plan view of the belt tightening device. Fig. 6 shows the form of one of the knives already referred to. Figs. 7, and 8 show in perspective a pair of angular lug pieces as required for each knife. Fig. 9 is a view of a knife in position between its pair of lug pieces, the three parts being bound together by bolt and nut 31. Fig. 10 illustrates the device employed in clamping the two halves of the cylinder casing together. Fig. 11 is a sectional view of the joint between the lower portion of the cylinder casing F and the discharge door K.

A A A are the legs of the hominy mill, of which legs there are three pairs.

B is the main driving shaft with which the knife cylinder C is fitted to revolve.

F is the lower half of the cylinder casing and also forms the bed of the hominy mill, a frame being extended from the ends of this casing to which frame the leg structures are bolted.

The corn is fed into the hopper G, from whence it passes to the knife space, through an opening in the upper half of the cylinder casing I, this opening extending in width between the points 43—44 and in length, a distance about equal to the length of the inside of the hopper G. This opening is known as the inlet opening, and is closed by the inlet door H.

In order to provide a ready means of access to the cylinder C, and the interior of the hominy mill, the upper half I of the cylinder casing is made to open, swinging upon the hinges J, one part of these hinges being formed as part of the upper half casing I, and the other part of these hinges being formed as part of the lower half casing F. The corn after having been acted on by the knives E, is discharged through the outlet opening 3—4 in the lower half casing F, this discharge opening being the length of the interior of the cylinder casing. This discharge opening is closed by the door K, which door when closed forms a part of the lower half casing F. This discharge door is hinged along its upper edge to the lower half casing F, so that it may swing outward, but it may be held closed by means of the weight L in the following manner: The shaft M is journaled in the leg structures A A A parallel to the shaft B. Fitted to revolve with the shaft M, are the finger N, the arm O, and the handle P. The arm O carries the weight L, which turns the shaft M on its axis, and with it the finger N. The finger N bears near its outer end against the door K, in such a manner that the movement of the finger N due to the weight L closes the door K. After the charge of corn has been sufficiently acted on by the knives E E E, it is discharged by opening the door K

for which the handle P has been provided. This handle P is fitted to revolve with the shaft M, and upon being moved in the direction of 5 will rotate shaft M, raise weight L and remove the pressure of finger N on door K, when door K will swing open by the combined action of gravity and the centrifugal force of the charge of corn being acted on. It is preferable to have more than one finger N upon the shaft M, acting similar to the finger described, but distributing the pressure due to the weight L over the door K.

The joint between the discharge door K and the lower half casing F, along the line represented by point 3 is preferably made as shown by Fig. 11, in which door K has one edge 40 bearing on a beveled face 41 of lower half casing F. This construction furnishes a tight joint, and will not be clogged by the accumulation of dust, as would be the case were two flat faces to form the joint. The device illustrated by Fig. 11 also furnishes a stop for the inward swing of door K. The arm O has a series of notches along its upper edge to allow the distance of the weight L from its fulcrum to be varied, in order to vary the pressure closing door K when necessary.

The inlet door H is constructed as shown, consisting of two wings, one of which extends from 1 to 2 and conforms to the curvature of the cylinder casing, and when closed forms a part of the upper half casing I. The second wing of door H extends from 1 to 6, and has for its outer surface an arc of a circular cylinder, the axis of which arc is a line shown in end view by point 7. This inlet door H is swung outwardly about the axis 7, and a dust tight hinge is secured by making the edge of the casing along the lower side of opening 43—44 of a section which is a circular arc, and which has for its axis the axis 7 already referred to. The lower edge of door H is concaved to fit the edge of casing I just referred to as a section of a circular arc. This arrangement allows the door H to swing about axis 7 securing a double purpose, one feature of which is that the outer surface of wing 1—6 being a circular cylindrical arc swung on its axis, will allow this outer surface of 1—6 to remain in contact with the side G′ of hopper G, at all points of the swing of door H, thus preventing any escape of dust or larger particles between door H and hopper G.

The second feature secured by the above described construction of door H is that it very materially assists the passage of corn from the hopper G to the working space within the cylinder casing I F, as follows: When the door H is closed the wing 1—2 forms a part of the cylinder casing I F, making the inner boundary of the section of the cylinder casing I F a continuous circle. The continuity of this circle is broken by the opening of the door H, which opening is required to be of but small amount. This causes the corn to enter the working space of the cylinder casing I F in a tangential direction, so that the knives E E E which rotate in a direction from 1 to 2, strike the grains of corn in nearly the same direction at which they enter the cylinder casing I F and thus drive the grains directly into the working space and do not show the tendency to beat the corn back into the hopper which occurs when the corn enters the working space in a radial direction.

The door H contructed as above described, allows an unbroken inlet opening extending the full length of the hopper G, and to prevent the escape of dust and corn at the ends of the door, a close working fit is made between the ends of the door H and the inner sides of the ends G^2 of the hopper G. The joint between door H and casing I at point 2 is preferably made beveled as shown in Fig. 1, as this construction forms a close joint and in addition provides a stop for the inward swing of door H.

The mechanism for opening, closing and latching door H is as follows: The frame of the hopper G is extended to form bearings for the shaft R, which extends the length of the hopper. Fitted to revolve with the shaft R is a crank S, which connects by means of a link T, and pins T′ and T^2 with a lug U formed as part of the door H. The handle V is fitted to revolve with the shaft R. If the handle V be moved in the direction of 8, it will rotate the shaft R and through it the crank S, which through the link T and pins T′ and T^2 and lug U will cause the door to swing open upon its axis 7. The arrangement of the parts R, S, T, T′, T^2, U, V, and H is preferably such, that when the door H is closed by means of the handle V, the center of the pin T, shall not have quite reached the straight line joining the centers of the shaft R and pin T^2, so that an additional pressure on the handle V will throw the center of T′ over the straight line joining the centers of R and T^2, by slightly springing the parts. After the parts have been sprung into the position last referred to, the motion of these parts is limited by the end V′, of the handle V coming in contact with the cylinder casing or any suitable stop, which it will be seen latches the door H, until the point T′ shall be made to recross the line joining the centers of R and T^2 by means of the handle V, and thus the door H may be unlatched and opened by a single motion of the handle V, which will also suffice to close and latch the door H.

The belt tightening device is shown in Figs. 2, 4, and 5 W being the driving pulley fixed to rotate with the main shaft B. A shaft Y is journaled in the leg structure A A A parallel to main shaft B, and fitted to revolve with or about this shaft Y is the forked piece Z. Each of the forks Z′ Z′ forms a box Z^2 Z^2 in which is journaled the shaft Z^3 of the idler or tightening pulley X.

Formed on the forked arms Z′ Z′ are lugs

Z^4 to which is hinged the piece 10. Piece 10 has a boss at its center in which boss the end of a screw 12 is fitted to revolve. Screw 12 is fitted in a nut tapped in yoke 14, which yoke is journaled in the brackets 15, which brackets are attached to the leg structures A A A A. The end 16 of the screw 12 is shaped to receive a handle or wrench, for turning this screw. The screw 12 upon being turned swings the forked piece Z about its axis, which is the center of the shaft Y by means of the connecting piece 10. This movement is made possible by the hinge joints between lugs Z^4 and piece 10, and the journaling of the piece 10 in the brackets 15. This swinging of Z about the shaft Y throws the idler or tightening pulley X against or away from the driving belt, W' W' W' as it is desired to tighten or loosen the driving belt.

The cutting knives are made of steel and of a shape similar to that shown by Fig. 6 in which 17—17 is of slightly smaller radius than the inner circle of the cylinder casing I F. The sides 17—19 are radial from 17—17 and constitute the cutting edges. The notch formed by 19—20 and 20—21 forms an end to the cutting edge for convenience in sharpening. The knife bears on the periphery of the cylinder along 21—21. The hole 22 admits the bolt which clamps the knife between the lug pieces. The two sides of the knife are made symmetrical to allow of its reversal when dull or broken.

A pair of angular lug pieces as shown by Figs. 7 and 8 are required for each knife. The leg 25 has its lower surface made to conform to the curved surface of the knife cylinder C, and the outer face 27 of lug 26 is formed flat and so that its plane shall be perpendicular to the axis of the knife cylinder C. The hole 28 is to admit the bolt referred to for clamping the knife between its pair of lug pieces.

The series of lugs as shown by Fig. 8 are permanently secured to the knife cylinder C, having one or more bolt holes 29 for that purpose. With each lug shown by Fig. 8 is one as shown by Fig. 7, the latter being bolted to the knife cylinder C through one or more slots 30, to allow for its ready removal by simply loosening the bolts just referred to. This slot also allows the ready adjustment of these lug pieces as regards each other for knives of different thicknesses, and for the removal of a knife, or the replacement of one.

The knives are preferably attached to the cylinder in rows parallel to the axis of the cylinder, and the knives in a row spaced at equal distances from each other, the space between any two adjacent knives in a row being equally divided by knives in the other rows, thus allowing no two knives to be in the same plane. It is desirable that the plane of the knives should be perpendicular to the axis of the cylinder in order that there should be no screw action of the knives which would tend to move the grain endwise in the working space.

In order to provide a ready and powerful means of clamping the two parts of the cylinder casing together, the device shown by Fig. 10 is employed. A lug 32 projects from one of the half cylinder casings near the edge forming the joint between the two half casings, this lug being slotted to receive the end of a piece 33. A pin 34 passes through lug 32 and the piece 33, allowing the piece 33 to swing about the pin 34. The piece 33 is threaded a portion of its length, and on this threaded portion is fitted a nut 35 which is turned by means of a handle 36. On the edge of the second half cylinder casing, and directly in line vertically with lug 32 is a lug 37, having a slot 38 formed in such a way that when the screw 33 is swung about pin 34, the screw 33 will pass into the slot 38, when the nut 35 may be screwed down on lug 37, binding the two parts of the casing together. A slight turn of the nut 35 is sufficient to allow the screw 33 to be thrown out of the slot 38, which allows the upper half of the cylinder casing I to be swung open on its hinges J.

As many of the clamping devices shown in Fig. 10 may be employed as are necessary, the preferable construction being one on the hinge side, and two on the front of the hominy mill.

I am aware that hominy mills have been constructed in which the shelled corn is acted upon by rotary driven knives attached to a cylinder. I do not therefore claim such a combination broadly, but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a hominy mill, the combination with the feed hopper and the cylindrical casing, of an inlet door formed of two curved wings, one wing fitted to close the longitudinal opening in the cylindrical casing, and swinging upon a rounded edge of this inlet opening, the second wing having a cylindrical surface abutting a side of the feed hopper, substantially as shown and for the purposes set forth in this specification.

2. In a hominy mill, the combination with the feed hopper and the cylindrical casing, of a two winged door, a lug fitted thereto, a rack shaft, a link, link pins, a crank and operating handle, arranged substantially as shown and for the purposes set forth in this specification.

3. In a hominy mill, the combination with the knife cylinder of a two edged sheet metal knife, a pair of angular lug pieces, one leg of each of which lug pieces being curved to fit the surface of the knife cylinder and provided with holes or slots for bolting thereto, the second leg of each of said lug pieces being flat and provided with bolt holes, a clamp bolt binding the sheet metal knife between the pair of lug pieces, and clamp bolts bind-

ing the lug pieces to the knife cylinder, all substantially as shown and for the purposes set forth in this specification.

4. In a hominy mill, the combination with the knife cylinder, of a series of pairs of angular lug pieces bolted thereto, a sheet metal knife bound between each pair of lug pieces by means of a clamp bolt, substantially as shown.

RAY G. JENCKES.

Witnesses:
JNO. G. D. MACK,
GEO. M. CRANE.