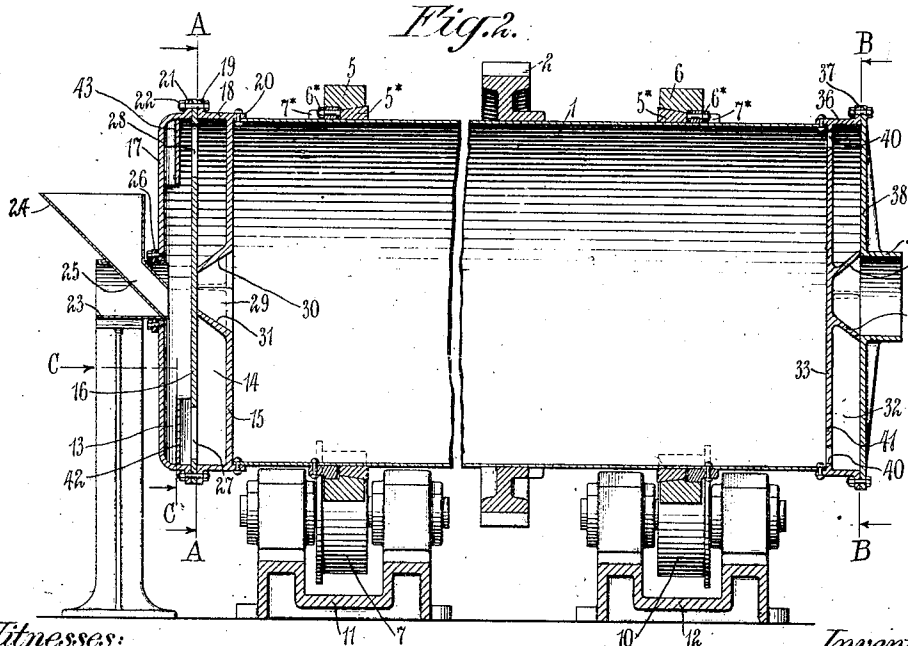
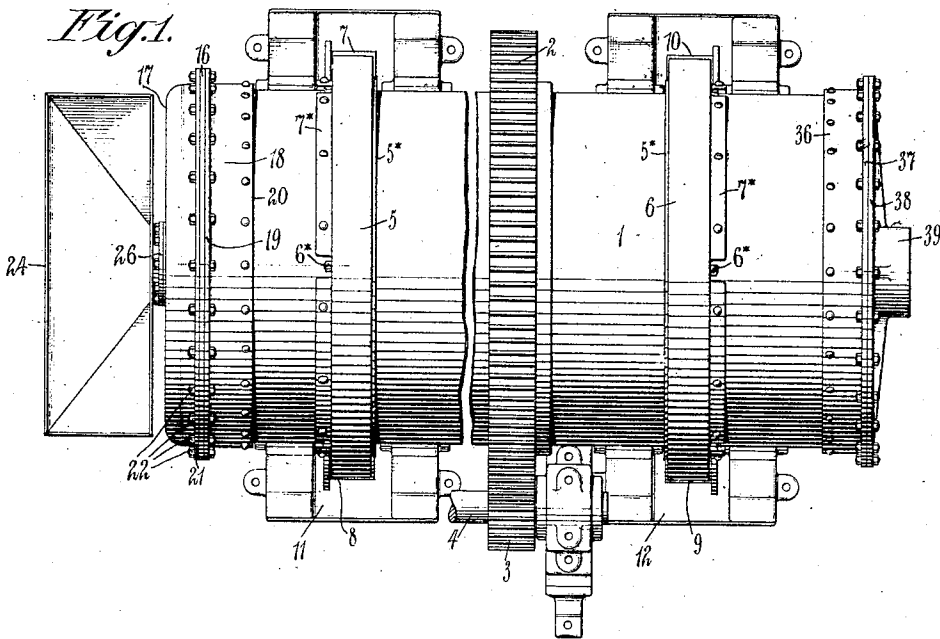


C. F. BALL.
 PEBBLE MILL.
 APPLICATION FILED NOV. 15, 1910.

1,055,599.

Patented Mar. 11, 1913.

2 SHEETS—SHEET 1.



Witnesses:
 Harry G. Gluscher
 F. George Barry

Inventor:
 Charles F. Ball
 By Edward C. Howard

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2 SHEETS-SHEET 2.

Fig. 3.

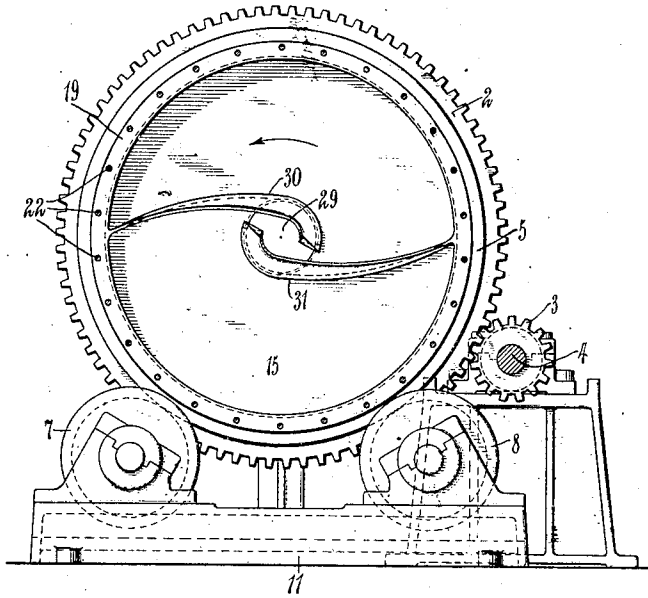


Fig. 5.

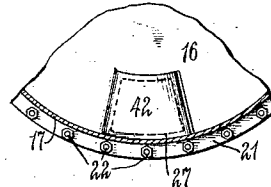
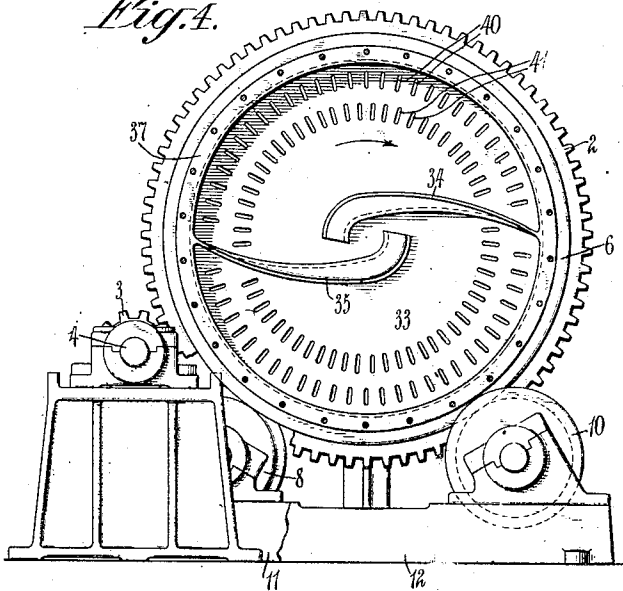


Fig. 4.



Witnesses:
 Harry C. Fleischer
 J. George Barry.

Inventor:
 Charles F. Ball
 By Edward C. Leonard

UNITED STATES PATENT OFFICE.

CHARLES F. BALL, OF RICHMOND HILL, NEW YORK, ASSIGNOR TO BALL & JEWELL, OF BROOKLYN, NEW YORK, A FIRM COMPOSED OF CHARLES F. BALL AND HARRY A. JEWELL.

PEBBLE-MILL.

1,055,599.

Specification of Letters Patent.

Patented Mar. 11, 1913.

Application filed November 15, 1910. Serial No. 592,486.

To all whom it may concern:

Be it known that I, CHARLES F. BALL, a citizen of the United States, and resident of Richmond Hill, in the borough of Queens, in the city and State of New York, have invented a new and useful Improvement in Pebble-Mills, of which the following is a specification.

My invention relates to a pebble mill, the object being to provide a mill of this character which will feed the material to be operated upon into the tumbling barrel and remove the treated material from the tumbling barrel in such quantities and with such regularity as will conduce to the best results.

A practical embodiment of the invention is represented in the accompanying drawings, in which,—

Figure 1 is a top plan view of the tumbling barrel and its accessories. Fig. 2 is a vertical longitudinal section through the same. Fig. 3 is a vertical transverse section in the plane of the line A—A of Fig. 2. Fig. 4 is a vertical transverse section in the plane of the line B—B of Fig. 2, and Fig. 5 is a partial vertical transverse section in the plane of the line C—C of Fig. 2.

The tumbling barrel is denoted by 1. It is of cylindrical form and is provided preferably near one end, with a spur wheel 2 fixed thereon, which spur wheel meshes with a pinion 3 on a drive shaft 4 which receives power in any suitable manner from any suitable source, not shown.

The barrel 1 is provided with a pair of annular tracks 5 and 6 which surround it and which bear on rollers arranged in pairs at the base, the members of one pair of rollers on which the track 5 bears being denoted by 7 and 8 and the members of another pair on which the track 6 bears being denoted by 9 and 10. The tracks 5 and 6 are secured in position on the barrel 1, by means of wedge blocks 5* drawn into position between the under side of the track and the outer face of the barrel 1, by means of draw bolts 6* fixed to the wedges and passing through stationary bands 7* riveted to the wall of the barrel. These rollers 7, 8, 9 and 10 are mounted in suitable bearings on bases denoted respectively by 11 and 12.

The tumbling barrel 1, at its receiving end is provided with narrow chambers, the outer one, denoted by 13, being conveniently

referred to as the receiving chamber, and another adjacent to the receiving chamber 13, denoted by 14, being conveniently referred to as the feed chamber. The feed chamber 14 is separated from the interior of the barrel by a diaphragm 15, and from the receiving chamber 13 by a diaphragm 16. A dish shaped end cap 17 forms the end and peripheral walls of the receiving chamber 13. These chambers 13 and 14 are conveniently formed by providing the diaphragm plate 15 with a peripheral flange 18 forming the peripheral wall of the feed chamber 14, the said peripheral flange 18 terminating at one end in an outwardly projecting flange 19 and at the opposite end being projected beyond the face of the diaphragm 15 to form a flange 20 adapted to overlap the wall of the barrel 1 for the purpose of riveting the flanged diaphragm 16 to the end of the barrel 1. The dished cap 17 is also provided with an outwardly projecting flange 21 and between these flanges 19 and 21, the outer edge of the diaphragm 16 is placed and secured in position by through bolts 22. The dished end cap 17 is provided at its center with an opening for the reception of a tube 23, the said tube 23 forming a support for the feed hopper 24, the neck 25 of which extends obliquely downwardly across the interior of the tube 23 and opens into the receiving chamber 13. A packing ring 26 is secured to the end cap 17 in proximity to the exterior of the tube 23, to close the joint between the two while permitting the barrel with its receiving and feed chambers to rotate freely around the tube. The diaphragm 16 has openings 27, 28, located in the present instance near the outer edge of the diaphragm and diametrically opposite one another for permitting the passage of material through from the receiving chamber 13 to the feed chamber 14. The diaphragm 15 has at its center an opening 29, from the opposite walls of which, scoop-like blades 30 and 31 extend to the peripheral wall of the chamber 14. These blades 30 and 31 start from the wall of the opening 29, oblique to the longitudinal axis of the feed chamber 14, and gradually wind as they curve outward toward its periphery, until, when they reach the periphery, they are in a lateral direction substantially parallel to the longitudinal axis of the receiving chamber, that is, from their

inner ends to their outer ends, they start from a position oblique across the chamber and gradually approach a position directly across the chamber.

5 At the opposite end of the tumbling barrel 1, there is provided a narrow discharge chamber 32, in the present instance by means of a flanged diaphragm provided with curved twisted blades, quite similar to the blades 30, 31, on the diaphragm 15 already
10 described, the said diaphragm being denoted by 33 and its discharge blades by 34, 35. Like the diaphragm 15, it is provided with a peripheral flange 36 which is projected to overlap the end of the barrel 1 for
15 riveting it thereto, and also provided with an outwardly projecting flange 37 for bolting thereto an end cap 38, the latter provided with a centrally located discharge tube
20 39. The diaphragm 33 is provided with one or more annular series of openings for the discharge of the treated material, two annular series of openings being in the present instance shown, the outer annular series being
25 denoted by 40 and the inner annular series by 41.

It is to be assumed that the tumbling barrel 1 is to be supplied with the proper charge of pebbles for producing the scouring effect
30 desired upon the rice or other grain being treated.

The feed blades 31, 32 and the discharge blades 34, 35, as well as the peripheral flanges 18 and 36, are preferably formed integral with their respective diaphragms 15
35 and 33.

To assist in crowding the material through the openings 27, 28, in the diaphragm 16, oblique plates 42, 43, are provided in the receiving chamber 13 and extend
40 from the rear edge of the respective openings 27, 28, obliquely forward to the inner wall of the cap 17. The terms "rear" and "forward" are here used having relation to the direction in which the barrel 1
45 rotates.

In operation, the material to be treated is fed into the hopper 24 and passes through the neck of the hopper into the receiving

chamber 13. From thence it passes through
50 the opening 27 or 28, as the one or the other approaches a position below the neck of the hopper during the rotation of the tumbling barrel, being crowded through the opening
55 by the oblique plate 42 or 43, and is scooped up by one of the arms 31 or 30 next succeeding in rotation the opening through which the material passes into the feed chamber 14. Because of the curve and twist
60 of the scoop arm and the rotation of the barrel, the material is gradually caused to travel toward the central opening 29 and through the opening into the barrel 1. The material after having been subjected to the action of the pebbles, is gradually dis-
65 charged through the several openings of the series 40, 41, at the opposite end of the tumbling barrel 1, and by means of the curved, twisted scoop arms 34, 35, and the turning of the barrel 1, is gradually caused
70 to travel toward the discharge opening 34 and forced outward therethrough.

The structure is one which is not liable to crack or mash the kernels being treated and serves to feed the material uniformly to and
75 discharge it uniformly from the barrel.

What I claim is:

In a machine of the character described, a tumbling barrel provided with a feed chamber at its end, and a feed blade extending
80 from the central portion of the feed chamber outwardly toward its periphery and gradually changing its obliquity to the longitudinal axis of the chamber in the lateral direction of the blade, the end portion
85 of the blade toward the periphery acting as a scoop, while the end portion of the blade toward the central portion of the chamber acts as a feed screw.

In testimony that I claim the foregoing as
90 my invention, I have signed my name in presence of two witnesses, this 11th day of November 1910.

CHARLES F. BALL.

Witnesses:

F. GEORGE BARRY,
HENRY C. THIEME.