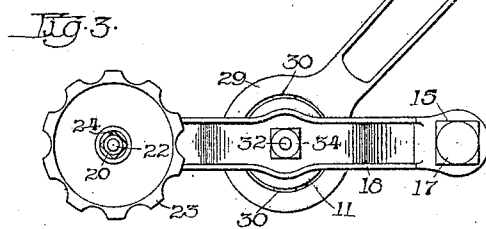
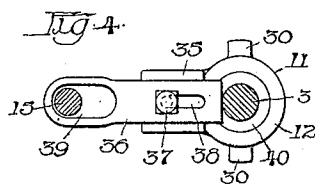
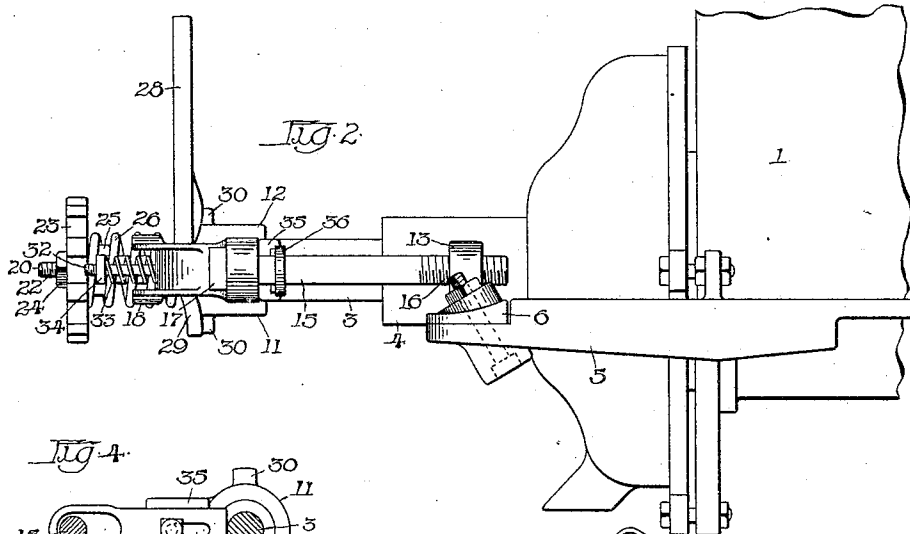
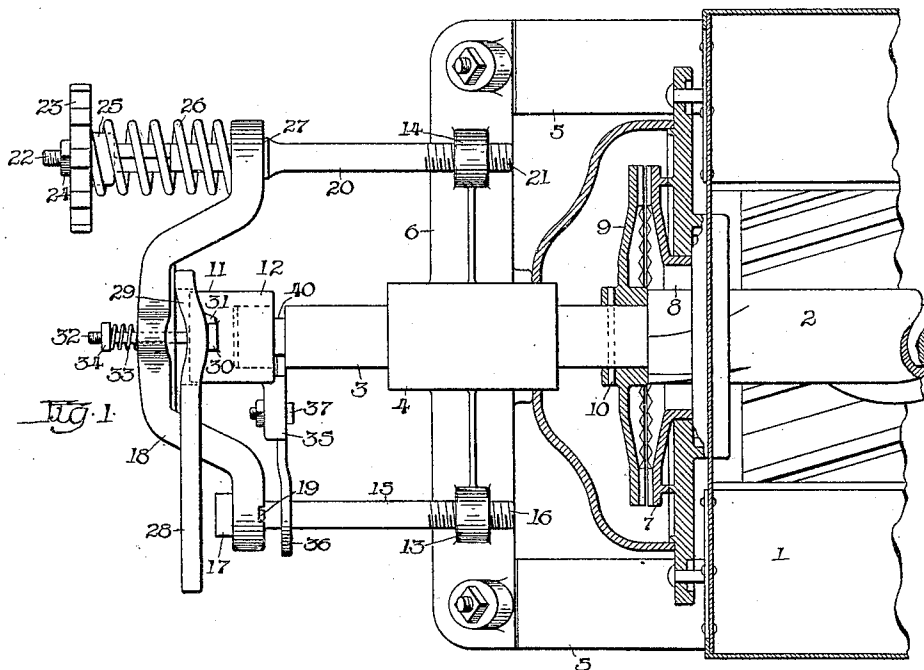


F. A. RYTHER.
GRINDING MILL.
APPLICATION FILED FEB. 1, 1909.

932,179.

Patented Aug. 24, 1909.



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UNITED STATES PATENT OFFICE.

FRANK A. RYTHUR, OF CHICAGO, ILLINOIS, ASSIGNOR TO INTERNATIONAL HARVESTER COMPANY, A CORPORATION OF NEW JERSEY.

GRINDING-MILL.

932,179.

Specification of Letters Patent.

Patented Aug. 24, 1909.

Application filed February 1, 1909. Serial No. 475,369.

To all whom it may concern:

Be it known that I, FRANK A. RYTHUR, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a specification.

My invention relates to that class of grinding mills having vertically arranged grinding plates, one of which is secured to a longitudinally movable shaft in a manner to rotate therewith and be adjustable to and from a fixed coacting plate; the object of my invention being to provide an improved form of spring controlling mechanism operative to yieldingly press the plates in operative engagement, and a quick release mechanism associated with said controlling means and adapted to permit the plates to separate in the event of foreign matter being admitted between them that would cause the obstruction or injury of their grinding faces.

The objects are attained by means of the mechanism illustrated by the accompanying drawings, in which—

Figure 1 is a plan view, partly in section, of part of a grinding mill having my invention embodied in its construction; Fig. 2 is a side elevation of Fig. 1; Fig. 3 is a detached detail drawing of part of the quick release mechanism; and Fig. 4 is a detail of part of the step bearing, showing the means for preventing rotation thereof.

Like reference characters designate the same parts throughout the several views.

1 represents a portion of the feeding hopper, 2 the feeding cylinder, and 3 is a longitudinally arranged shaft journaled in a bearing 4.

5 represents extended ear portions forming part of the main frame of the machine and having a transverse bar 6 secured thereto, the bearing 4 forming part of the bar. A fixed grinding plate 7 is secured to the frame and provided with an axial feed opening 8, and 9 designates a rotatable grinding plate secured to the shaft 3 by means of a pin 10. The shaft 3 is movable longitudinally in the bearing 4 in a manner to control the position of the rotatable grinding plate relative to the non-rotatable one, and 11 represents a cap piece having an axially arranged cup portion 12 adapted to receive the end of said shaft in a stub-like manner.

13 and 14 represent ear portions integral with the bar 6, and 15 is a stud having a threaded portion 16 at its inner end whereby it may be adjustably connected with the ear 13 and a hood 17 at its outer end.

18 designates a bow-shaped lever having one end loosely connected with stud 15 and retained in position thereon by means of the hood 17 at one side and a pin 19 at the opposite side thereof; the opposite end of the lever being provided with an opening that receives a stud 20 that is provided with a threaded portion 21 at its inner end whereby it is adjustably connected with ear portion 14 of bar 6, and an annular portion 22 near its outer end that receives a hand wheel 23 that is adjustable longitudinally along the stud and retained against outward movement by means of a nut 24, and is provided with a boss portion 25 that is encircled by a coiled spring 26 operative between the inner face of the hand wheel and the lever in order to hold the latter in contact with a shouldered portion 27 formed upon the middle portion of the stud 20.

28 is a hand lever provided with an axial recess adapted to receive the outer end of the cap piece 11, the lever being provided with concentric cam surfaces 29 upon its inner and outer sides adapted to engage with radially projecting ears 30 upon the periphery of the cap and with the lever 18, and an inwardly projecting ear portion 31 adapted to contact with one of the ears 30 in a manner to limit the rotative movement of the latter relative to the cap. A stud 32 is connected with the outer end of the cap and, passing through the opening in the lever 18, is provided with a coiled spring 33 operative between an adjusting nut 34 and the lever in a manner to yieldingly hold the cap piece in contact with the lever.

Integral with the cap piece 11 is a laterally projecting ear 35 provided with ribs, between which is secured an arm 36 by means of a bolt 37 passing through a slotted opening 38 in the arm, whereby the latter may be adjusted radially relative to the cap, the outer end of the arm being provided with a slotted opening 39 adapted to loosely receive the stud 15, and its inner end received by an annular groove 40 formed in the shaft 3, the arm performing the double function of preventing rotation of the cap

and also connecting it with the shaft in a manner to cause it to move longitudinally therewith.

In operation the grinding plate may be 5 adjusted to grind the material to any desired degree of fineness by means of the double studs 15 and 20 and lever 18, the shoulder upon the stud 20 and the pin 19 in stud 15 limiting the inward movement of the 10 lever in a manner to prevent injurious contact of the plates when from any cause they are allowed to run without a supply of material, and in case foreign matter should be accidentally admitted to the grinding 15 plates and endanger their safe operation, the shaft may be moved longitudinally against the pressure of the spring 26 in a manner to separate the plates. The operator may turn the hand lever about its axis and cause the 20 cam surfaces thereof to relieve the cap and shaft from the pressure of said spring, and the spring 33 then becomes operative in a manner to draw the cap and shaft outward. The tension of the spring 26 may be adjusted 25 by means of the nut 24 in a manner to vary the degree of force required to separate the plates without changing the limit of the inward movement of the shaft and the rotatable plate.

30 What I claim as my invention, and desire to secure by Letters Patent, is:

1. A grinding mill including, in combination, a frame, a fixed grinding plate, a longitudinally movable shaft, a rotatable grinding plate secured to said shaft, means for adjusting said shaft longitudinally, said means 35 including a cap, said cap having an axially arranged cup portion adapted to receive the end of said shaft, studs arranged upon opposite sides of said shaft and having their inner ends adjustably secured to said frame, a controlling lever having one end pivotally connected with one of said studs and its oppo- 40

site end slidably connected with the other, a spring operative to press the slidable end of the lever inward, a hand lever rotatably 45 mounted upon said cap, having its inner face provided with a cam adapted to contact with said cap and its outer face contacting with said controlling lever in a manner whereby 50 a rotative movement of the hand lever permits a relative longitudinal movement of the cap and controlling lever in opposite directions, a stud secured to said cap and received by an opening in said controlling lever, and 55 a spring operative in connection with said stud to yieldingly draw said cap toward said controlling lever.

2. A grinding mill including, in combination, a frame, a fixed grinding plate, a longitudinally movable shaft, a rotatable grinding plate secured to said shaft, means for adjusting said shaft longitudinally, said means including a cap, said cap having an axially 60 arranged cup portion adapted to receive the end of said shaft, a removable piece secured to said cap and adjustable radially thereon, an annular groove in said shaft adapted to receive the inner end of said adjustable piece, 65 studs arranged upon opposite sides of said shaft and having their inner ends adjustably secured to said frame, a controlling lever having one end pivotally connected with one of said studs and its opposite end slidably 70 connected with the other, said controlling lever being connected with said cap and said adjustable piece having a slotted opening at its outer end, and one of said studs received by said slotted opening, and means forming 75 part of said studs and operative to limit the inward movement of said controlling lever. 80

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Witnesses:

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