

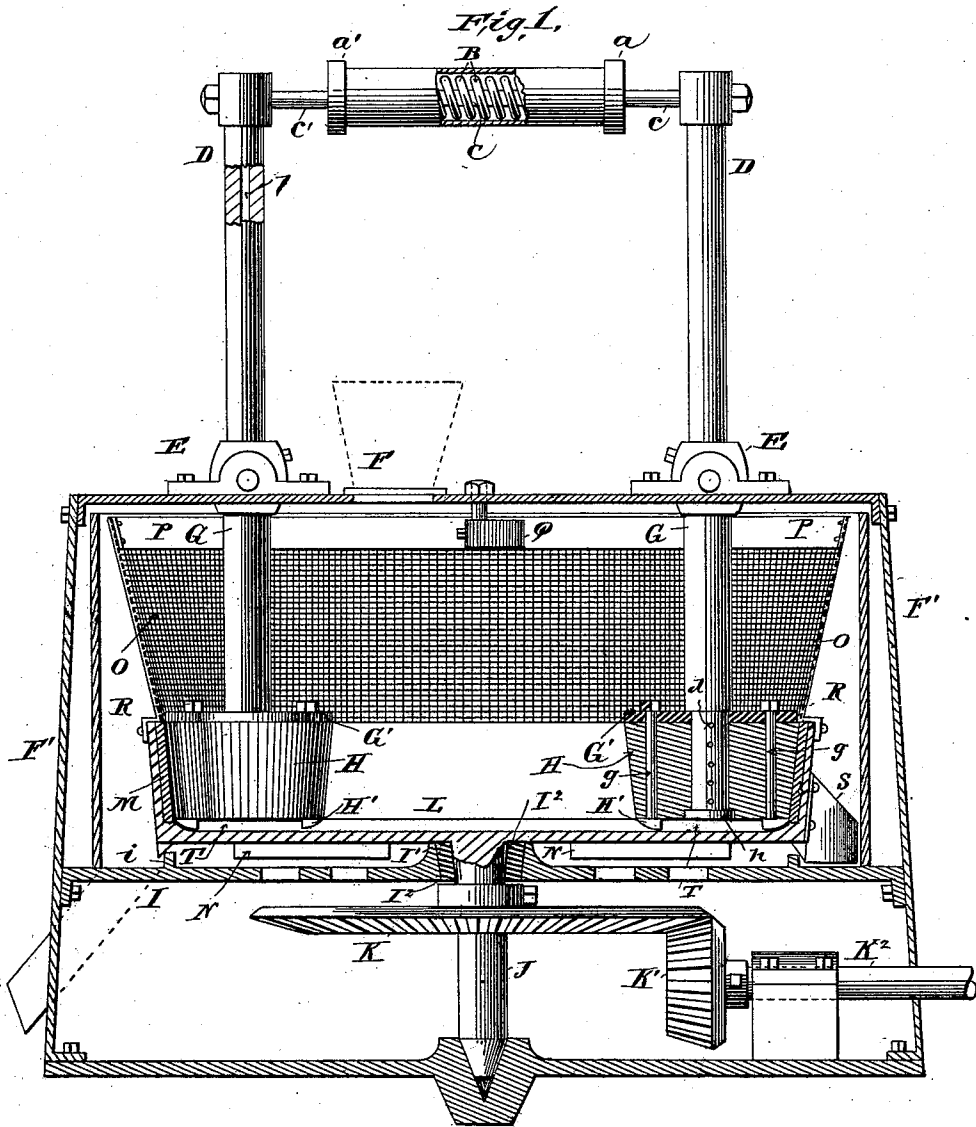
(No Model.)

2 Sheets—Sheet 1.

F. J. JUDD.  
PULVERIZING MILL.

No. 522,377.

Patented July 3, 1894.



Attest:  
 C. W. Benjamin  
 Matthew Bowen

Inventor,  
 Fred J. Judd,  
 by M. Bowen  
 atty

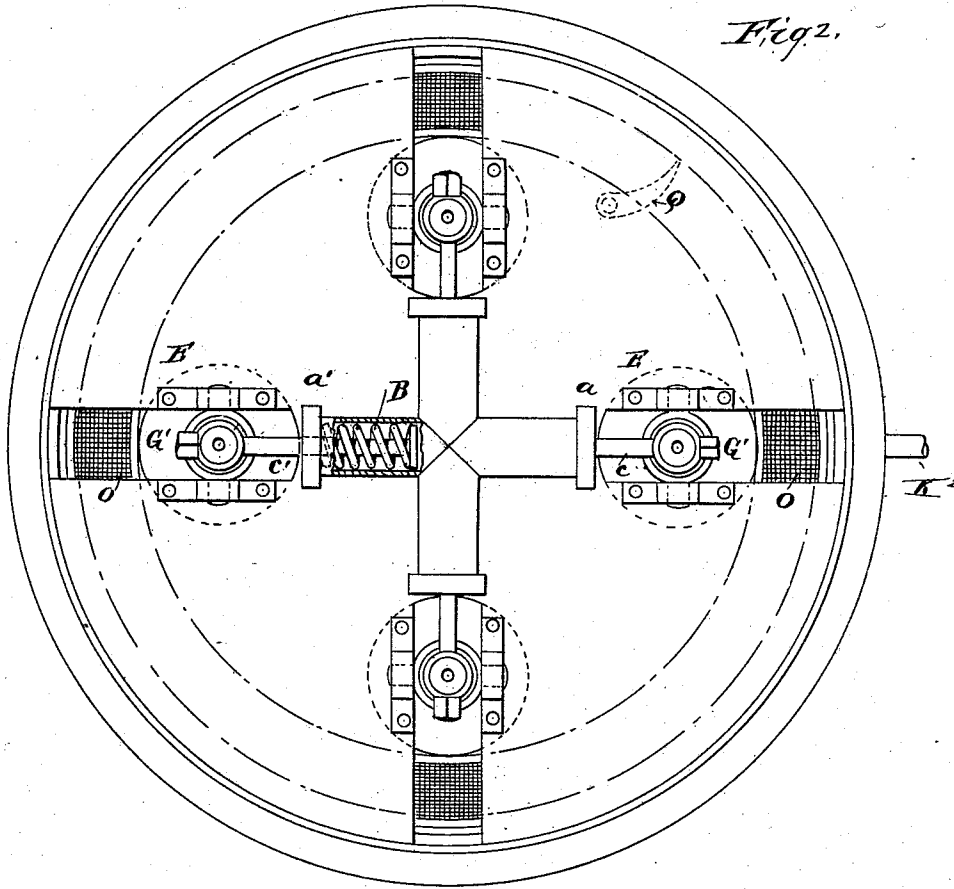
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2004

# UNITED STATES PATENT OFFICE.

FRED JUNIUS JUDD, OF JERSEY CITY, NEW JERSEY, ASSIGNOR OF ONE-HALF TO WILLIAM HENRY DITTMAR, OF SAME PLACE.

## PULVERIZING-MILL.

SPECIFICATION forming part of Letters Patent No. 522,377, dated July 3, 1894.

Application filed July 11, 1893. Serial No. 480,133. (No model.)

*To all whom it may concern:*

Be it known that I, FRED JUNIUS JUDD, of Jersey City, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Pulverizing-Mills, of which the following is a specification.

I will describe a mill embodying my improvement in detail and then point out the novel features in the claims.

10 In the accompanying drawings Figure 1 is a central vertical section of a pulverizing mill embodying my improvement and Fig. 2 is a top view of a modified form of the same, parts of the interior being shown in dotted outline.

15 Similar letters of reference designate corresponding parts in both figures.

A designates a casing in which is contained an open spring B. A rod C passes into the casing A and through the spring B. The spring B rests at one end against the side *a* of the casing while at the other end it rests against a head on the rod C.

20 C' designates another rod also passing into the casing A and having a head which rests against the inner side of the end *a'* of the casing.

30 The rods C C' are bolted at the opposite ends to those which enter the casing A, to the shafts D. These shafts D are made hollow as shown at *l* so that oil or other lubricating agent may be passed through them.

35 The shafts D are hung in trunnion boxes E, bolted to the cover F of the outer casing of the mill. The portions of the shafts D below the trunnion boxes E are covered with sleeves G to keep the material in the mill away from the shafts D.

40 Preferably cast in the same piece with the sleeves G are the flanges G'. Bolts *g* passing through the rolls H and lower plate H' fasten said flanges G', rolls H and lower plate H' together.

45 The shafts D have one or more holes *d* in those portions of said shafts around which the rolls H revolve. These holes *d* permit the escape of the lubricating material which is fed through the shafts D. On the bottoms of the shafts D are collars *h* for holding the rolls H in place.

50 F' designates the outer casing of the mill.

Bolted to this casing F' is a plate I tapered at I' and in this tapered portion is fitted a box I<sup>2</sup> for taking up the wear of the main shaft J of the mill.

To the main shaft J is fitted the bevel gear wheel K which intermeshes with the bevel gear wheel K' mounted on the shaft K<sup>2</sup> which is connected by belting or otherwise with the motive power for operating the mill.

The main shaft J is keyed to the pan L. This pan is lined on the inside with a metal ring M which may be removed and replaced at pleasure by another ring.

65 N designates fans arranged on the under side of the pan. From the top of the pan there extends upward a screen O preferably made in sections so that if injury should happen to any portion of the screen the damaged portion may be repaired without removing the entire screen.

70 Fastened to the upper end of the screen O is a metal ring or band P against which press scrapers Q fastened to the cover F.

I will now describe the operation of the mill. The motive power being applied the shaft K<sup>2</sup> will revolve, revolving with it the bevel gear wheel K' and the intermeshing bevel gear wheel K. This will cause the rotation of the main shaft J. The motion of the main shaft J revolves the pan L containing the material which it is desired to pulverize, and as the pan L revolves the rolls H will be caused to revolve also. The material in the pan passing between the rolls H and the ring M will be pulverized, and this pulverized material will be caused to fly upward against the screen O by the centrifugal force generated by the motion of the pan L and the rolls H. If the material has been pulverized sufficiently it will pass through the screen and fall into the trough R and be gathered together by the scraper S affixed to the outside of the pan and discharged through a hopper suitably arranged. A lug *i* on the plate I prevents the pulverized material from getting under the pan L and choking it. In addition the fans N will create a current of air to throw the dust away from the main bearing. Should any material reach the metal band P the scrapers R will throw it back into

the pan. Underneath the rolls H I have arranged agitators T for stirring up any material which may stick.

By my improvement I produce a pulverizing mill of great simplicity and strength. The shafts D being hollow permit of lubricating material being freely supplied to the rolls, and as the rolls are held against the side of the pan by means of a spring B it is evident that there is not much danger of causing damage to the mill by the operation of grinding. The wear on the pan in the operation of grinding falls on the metal ring M which may at pleasure be removed and replaced by another ring.

In Fig. 2 I have shown four rolls applied. Indeed any desired number of rolls may be employed.

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

1. In a pulverizing machine, the combination of non-revolving hollow shafts, trunnion boxes therefor, sleeve surrounding said shafts below the boxes, rolls secured to the sleeves, holes in the lower parts of said shafts, means for drawing the upper ends of said shafts toward each other, a pan in which the rolls work, a screen arranged above said pan, a circular band above said screen, a scraper in contact with said band, a trough surrounding the screen, a scraper arranged on the outer side of the pan, fans arranged underneath the pan and means for revolving the pan, substantially as specified.

2. In a grinding mill the combination with an external casing having a bearing at its bottom, a partition arranged horizontally above the bearing and provided with a corresponding central opening, an annular flange arranged upon the upper side of the partition and encircling the opening, and a cylinder arranged upon said partition and encircling the flange, said partition having an

opening between the flange and cylinder, of a revoluble pan located in the cylinder above the partition and provided with a peripheral depending flange taking over that of the partition and having an upper perforate wall, a vertical shaft arranged in the bearing of the casing and passing through the opening in the partition and supporting the pan, means for revolving the shaft, vertical shafts arranged in the upper end of the casing and depending into the pan, loose rollers arranged on the lower ends of said shafts, and means for pressing the rollers against the wall of the pan, substantially as specified.

3. In a grinding mill the combination with an external casing having a bearing at its bottom, a partition arranged horizontally above the bearing and provided with a central corresponding opening, an annular flange arranged upon the upper side of the partition and encircling the opening, and a cylinder arranged upon said partition and encircling the flange, said partition having an opening between the flange and central opening therein, of a revoluble pan located in the cylinder and provided with a peripheral depending flange taking over that of the partition and having an upper perforate wall, a vertical shaft arranged in the bearing of the casing and passing through the opening in the partition and supporting the pan, means for revolving the shaft, vertical shafts arranged in the upper end of the casing and depending into the pan, loose rollers arranged on the lower ends of said shafts, and means for pressing the rollers against the wall of the pan, perforations formed in the partition and fans arranged on the underside of the pan over the perforations, substantially as specified.

FRED JUNIUS JUDD.

Witnesses:

J. R. BOWEN,  
MATTHEW BOWEN.