

E. T. LANSDOWNE.

GRINDING MILL.

APPLICATION FILED OCT. 12, 1909.

952,820.

Patented Mar. 22, 1910.

3 SHEETS—SHEET 1.

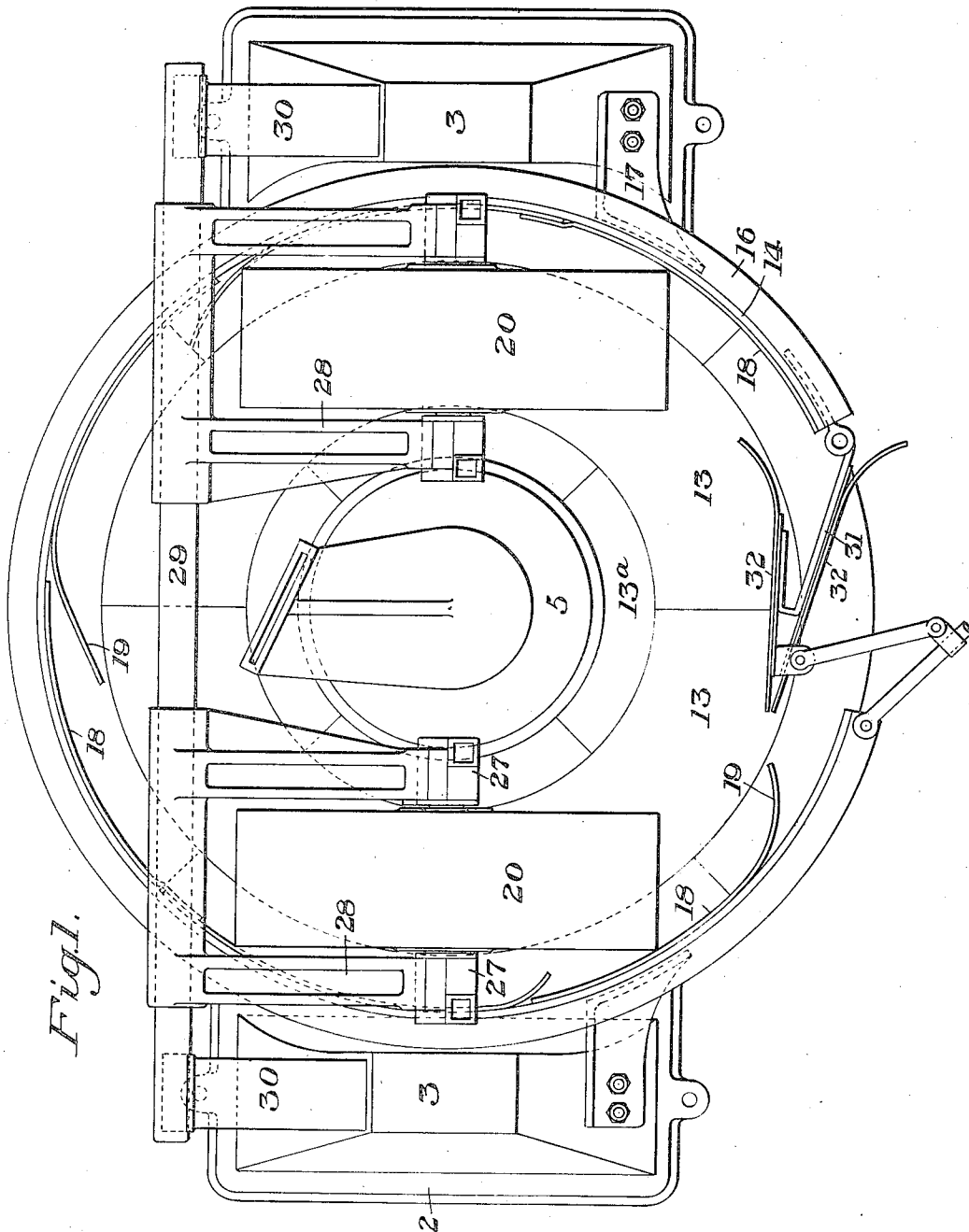


Fig. 1.

WITNESSES

R. H. Balderson
Walter Farnsworth

INVENTOR

E. T. Lansdowne
by Bakewell, Byrnes & Parmelee
his Attys.

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GRINDING MILL.

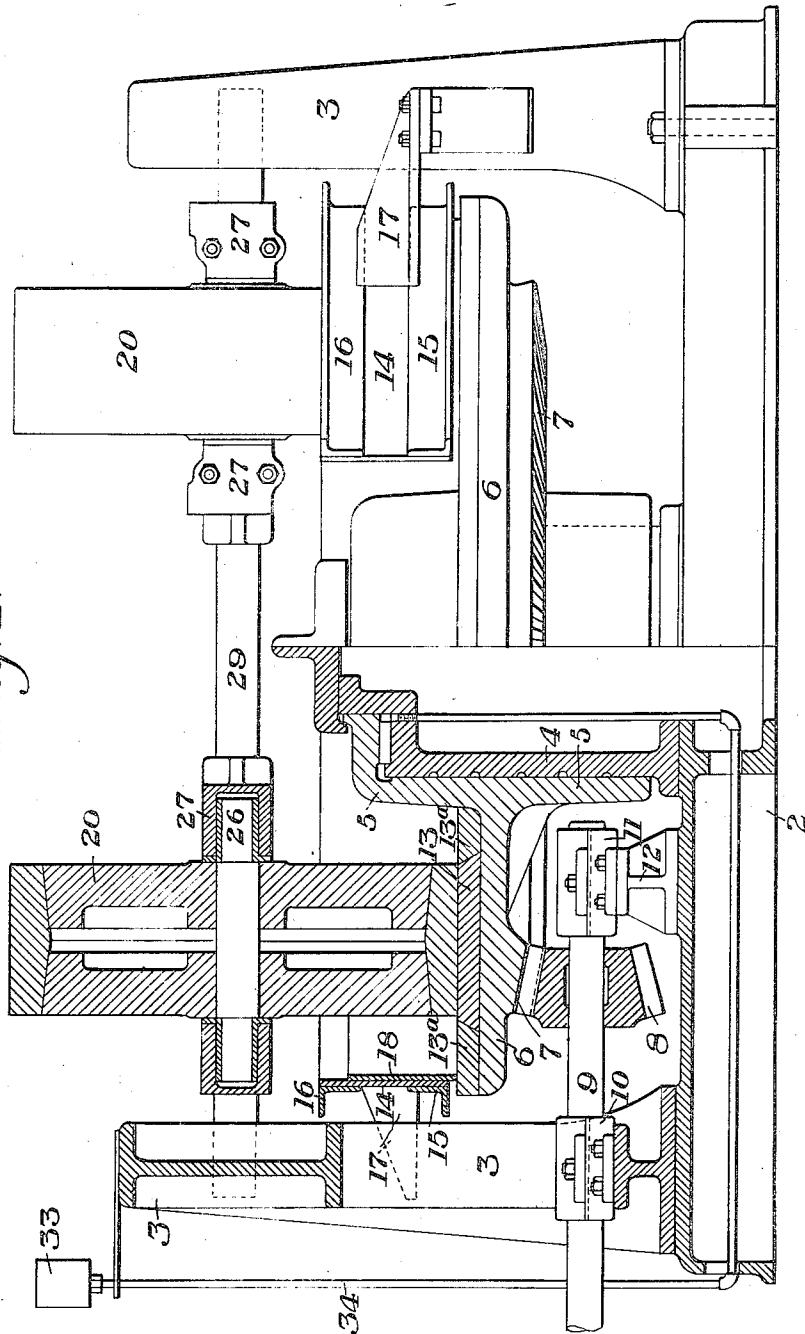
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3 SHEETS—SHEET 2.

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Fig. 2.



WITNESSES

R. H. Baldwin
Walter Farniss

INVENTOR

E. T. Lansdowne
by *Baker, Byrnes & Parmelee*,
his Attys

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3 SHEETS—SHEET 3.

Fig. 3.

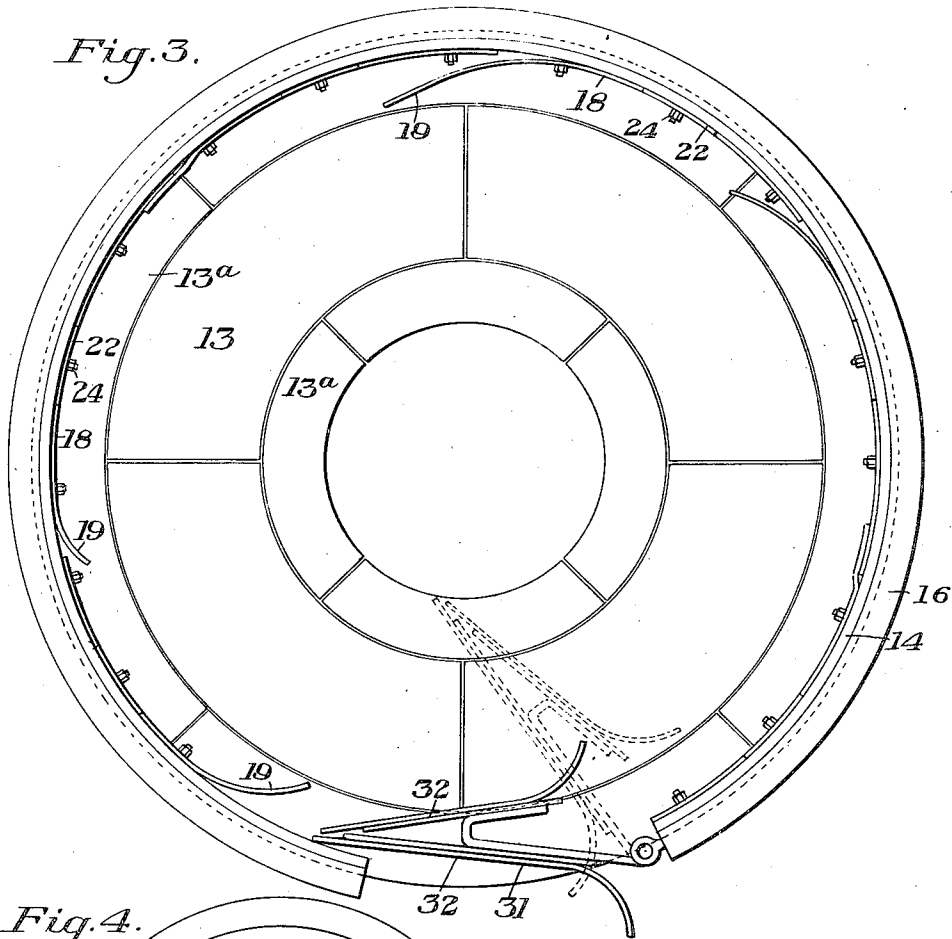
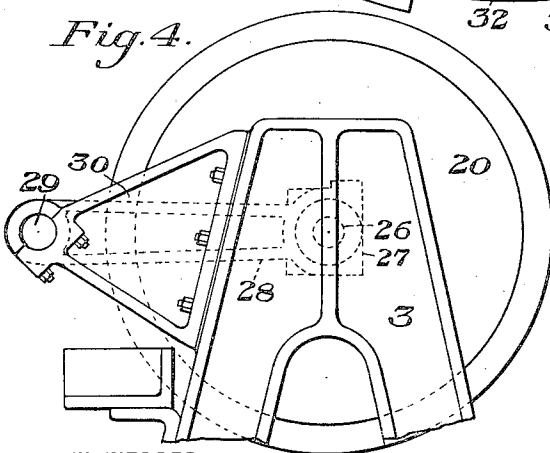


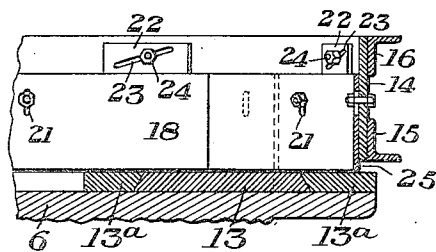
Fig. 4.



WITNESSES

R. A. Baldwin,
Walter Farnsworth

Fig. 5.



INVENTOR

E. T. Lansdowne,
by Baker, Byrnes & Parmelee,
his Attys.

UNITED STATES PATENT OFFICE.

ELIAS T. LANSDOWNE, OF COPPER CLIFF, ONTARIO, CANADA, ASSIGNOR TO INTERNATIONAL NICKEL COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

GRINDING-MILL.

952,820.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed October 12, 1909. Serial No. 522,335.

To all whom it may concern:

Be it known that I, ELIAS T. LANSDOWNE, of Copper Cliff, Ontario, Canada, have invented a new and useful Improvement in Grinding-Mills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a plan view of a mill embodying my invention; Fig. 2 is a view partly in vertical section and partly in side elevation; Fig. 3 is a plan view of the pan removed; Fig. 4 is a detail view showing a portion of the framework; and Fig. 5 is a detail sectional view showing a portion of the pan.

15 My invention has relation to grinding mills of the class commonly known as clay mills, mortar mills, or pug mills; and is designed to provide a mill which is compact, in which comparatively little head room is required, in which the wearing parts are minimized and are so constructed and arranged as to greatly simplify repairs; 20 which shall be efficient in its grinding action, and which will possess certain other advantages which will hereinafter more fully appear.

Referring to the drawings, in which I 30 have shown the preferred embodiment of my invention, the numeral 2 designates the base of the mill, which carries the two standards 3, and which is also provided with a center post or bearing 4, upon which an annular grinding pan is mounted to rotate. 35 This pan comprises a central hollow hub portion 5, which fits over a center post 4 and has a rotary bearing thereon, and which is surrounded by the annular grinding 40 flange or floor 6. The under side of this grinding floor is formed with an annular bevel gear 7 for engagement with a bevel tooth pinion 8 on a driving shaft 9. This shaft 9 is mounted in the two bearings 10 45 and 11, the bearing 10 being preferably bolted to one of the standards 3, and the bearing 11 being bolted to a pedestal 12 which is in turn secured to the base 2. By this arrangement of the driving shaft 9 and its bearings said shaft, together with the pinion 8, may be readily removed for repairs without disturbing the pan or any other part of the machine. The bearings 50 10 and 11 may be arranged at either side

of the center of the machine, as may be preferred. 55

The flange or grinding floor 6 of the pan is provided with the heavy removable wearing plates 13, preferably having dove-tailed edges fitting between the side plates 13^a. 60 The rim or curb 14 of the pan is preferably formed of a heavy rolled plate with angle stiffening flanges 15 and 16, at its upper and lower edges. This curb or rim, which is stationary, is supported by brackets 17, 65 which are secured to the frame standards 3. The inner side of the rim or curb is provided with liner plates 18, having their free edge portions bent outwardly over the side bottom plates 13^a, as shown at 19 in Figs. 70 1 and 3, for the purpose of forming plows to guide the material under the crushing rolls 20. These combined liner and plow plates are bolted to the rim, vertical slots 21 being provided for the securing bolts, 75 as shown in Fig. 5. They contact at their lower edges with the outer bottom plates 13^a, and are adjusted to take up wear by means of the lugs 22 having oblique slots 23 80 through which pass securing bolts 24. By loosening these bolts and driving the lugs in a direction to cause the bolts to move up in the slots 23, the liner plates will be forced 85 down so as to stand just clear of the bottom plates 13^a. By properly adjusting the brackets 17 which support the rim or curb, a certain amount of clearance, as indicated at 25 in Fig. 5, may be provided between the lower edge of the rim or curb, and the bottom plates 13^a, so that the rim, together with 90 its bottom stiffening flanges 15, are not subject to wear.

The crushing or grinding rolls 20 are each mounted on a short shaft 26 supported in bearings 27, mounted in or secured to the 95 ends of U-shaped arms or brackets 28, which are mounted on and free to swing around a shaft 29. This shaft 29 is secured in brackets 30, which are bolted to the frame standards 3, as shown in detail in Fig. 4. 100

One side of the curb or rim of the pan is provided with a hinged door section 31, which when closed constitutes a segment of the rim or curb, and has on its inner and outer faces adjustable liner and plow plates 105 32, which are similar to the liner and plow plates 18 before described. When this door is open, as shown in dotted lines in Fig. 3,

its inner edge rests against the hub portion of the pan, and it acts as a scraper to discharge the material outwardly from the mill through the door opening.

5 33 designates a lubricant reservoir having a discharge pipe 34 leading downwardly and underneath the pan, and thence upwardly within the hollow center post 4 and arranged to supply lubricant to the central
10 supporting bearing for the pan.

The only parts of the machine which require renewal are the combined liner and plow plates and the bottom wearing plates of the pan. All of these parts are easily removed and replaced without disturbing the
15 balance of the mill. The brackets 30 may be attached to either side of the frame standards so that the mill may be arranged either as a right or a left hand mill, as regards
20 both drive and discharge, without disturbing the base.

The mill is efficient in its action, since the material is being constantly diverted under the rolls by the plows, which can be shaped
25 and arranged to suit any given material being ground. A further advantage consists in the evenness of wear on the rolls, and the absence of excessive shock to the machine, the rolls being separately mounted on individual shafts, and free to swing vertically
30 about the shaft 29.

It will be obvious that many changes may be made in the details of construction and arrangement of the parts without departing
35 from the spirit and scope of my invention as defined in the appended claims. Thus, the construction of the supporting frame may be varied, the manner of securing and adjusting the wear plates can be changed,
40 and other changes in detail made.

I claim:—

1. In a grinding mill of the character described, a grinding pan consisting of a substantially horizontal rotatable grinding
45 floor, and a stationary rim or curb surrounding the outer portion of the grinding floor, together with wear plates removably secured to the inner side of and fitting the inner surface of the said rim or curb and extend-

ing below the same to a point adjacent to 50 the grinding floor, substantially as described.

2. In a mill of the character described, a rotary pan having a fixed curb or rim portion, the latter having a fixed door section 55 adapted to be swung inwardly across the pan, said door having wear plates on both its inner and outer surfaces, the inner wear plate having one edge portion curved to form a deflector in the normal closed position of the door, and the other wear plate having an edge portion reversely curved, the door being adapted to swing inwardly across the grinding floor of the pan, and the curved
60 portion of the last named plate acting as a discharge deflector for the material when the door is swung inwardly, substantially as described.

3. In a grinding mill, the combination with a rotating pan having a substantially 70 horizontal grinding floor, of a stationary rim or curb surrounding the outer portion of the grinding floor, and wear plates removably secured to and fitting the inner surface of said rim or curb, said plates extending below the lower edge of the rim,
75 together with means for vertically adjusting said plates up and down on the rim relatively to the grinding floor; substantially as described.

4. In a grinding mill, the combination with a rotating pan having a substantially 80 horizontal grinding floor, of a stationary rim or curb surrounding the outer portion of the grinding floor, and wear plates removably secured to and fitting the inner surface of said rim or curb, said plates being formed in sections with overlapping edge portions, the overlapping portion of each plate being deflected over the grinding
85 floor to form a plow; substantially as described.

In testimony whereof, I have hereunto set my hand.

ELIAS T. LANSDOWNE.

Witnesses:

GEO. R. CRAIG,
F. A. WALES.