

No. 639,360.

Patented Dec. 19, 1899.

J. C. CLARK.

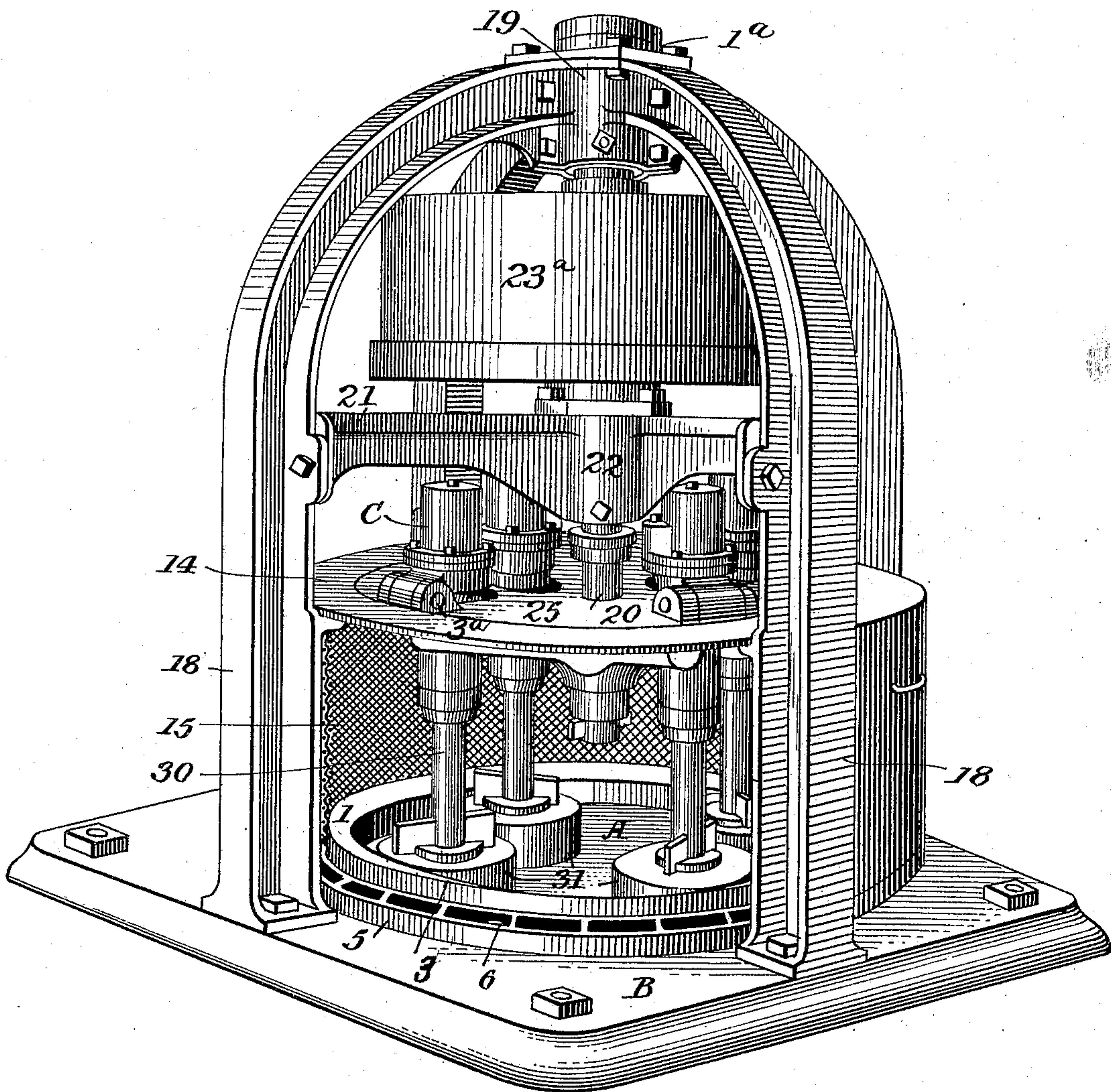
JOURNAL BOX FOR PULVERIZING MACHINES.

(Application filed June 9, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses

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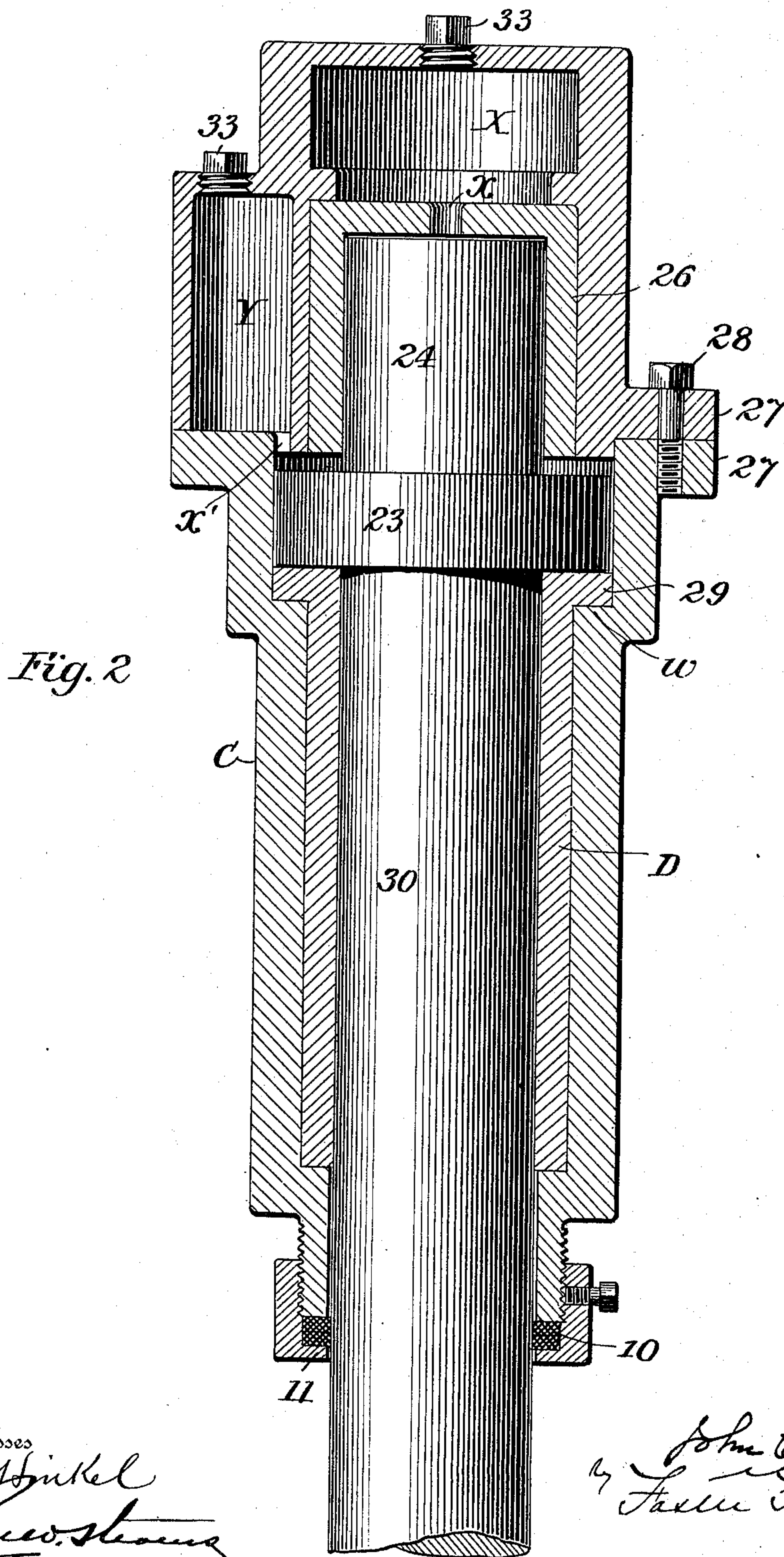
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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

JOHN CALHOUN CLARK, OF ATLANTA, GEORGIA.

## JOURNAL-BOX FOR PULVERIZING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 639,360, dated December 19, 1899.

Application filed June 9, 1898. Serial No. 683,011. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN CALHOUN CLARK, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Journal-Boxes for Pulverizing-Machines, of which the following is a specification.

In that class of grinding-mills in which one or more grinding-rolls are carried in a circle and revolve within a grinding-ring the supporting of the rotary roll-shafts has been attended with difficulties incident to the access of dust to the bearings, the wearing and heating of the latter and of the journals, and the attendant delays and expense for repairs and the waste and expense of lubricating materials. To obviate these objections, I have devised a form of bearing, as fully set forth hereinafter, and as illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a grinding-mill embodying the invention, parts being broken away to more clearly illustrate the arrangement of the grinding-rolls and pan; and Fig. 2 is a vertical sectional view of a journal-box of one of the grinding-roll shafts, the shaft being broken away.

The general arrangement of the mill is illustrated in Fig. 1, in which A represents the mortar, consisting of a pan 1 within an exterior casing 5, with intervening passages 6 for the downward passage of the material which has been ground and which has been thrown up against and passes through a screen 15, inclosed by a cover.

The mortar A is suspended within a base-plate B, on which is erected a frame, consisting of a suitable number of standards 18, curved to meet at a central hub 19, in which is the upper bearing of a driving-shaft 20, provided with a band-wheel 23<sup>a</sup>. The lower bearing of the shaft 20 is in a hub 22 at the meeting point of radial arms 21, extending to the standards 18. The shaft 20 extends downward through the hub 22 and carries a carrier-disk 25, which turns within a ring 14, supported by the standards 18 and constituting, with the disk, the cover of the grinding-chamber. Within openings in the carrier-disk are suspended, by suitable trunnions, a number of boxes C, containing the bearings of the upper

ends of shafts 30, to the lower ends of which are suitably secured the grinding-rolls 31, arranged within a grinding-ring 3, supported within and above the bottom of the basin 1. As thus supported the rotation of the driving-shaft and its disk will cause the rolls to fly outward, the boxes rocking on their trunnions 3<sup>a</sup> until the rolls travel on the face of the ring, grinding against the latter any material which is thrown upward between the rollers and ring by the forward travel of the rolls, which thus elevates the material. The rollers may be secured to the shafts in any suitable manner, and near the upper end of each roller-shaft 30 is a collar 23, so that a section 24 of the shaft projects above the collar, the box C being divided into two sections adjacent to said collar, each provided with a flange 27, and the flanges being secured together by bolts 28. Within the lower section of the box C is a bearing sleeve or brass D, preferably having at the upper end a flange 29, resting on a shoulder *w* of the box and receiving the collar 23, which thus rests on the upper end of the brass, while the body of the shaft below the collar has its bearing within the brass.

Heretofore where the shaft terminated at the top of the collar 23 there was great wear of the under face of the collar, and within the brass this wear was uneven, and the under face of the collar became rounded. As a consequence of the friction much oil was required, while the heating of the bearings occasioned delays. These objections have all been overcome by extending the shaft above the collar, forming a projecting part 24, and providing a separate brass or sleeve 26 for this portion, this brass fitting within the upper part of the box C, as shown.

In the box are two lubricating-chambers X and Y, and preferably each is provided with a narrow opening  $x$  or  $x'$ , so that only a limited quantity of lubricant can rest at one time upon the surface to be lubricated. The opening  $x$  may be in the bottom of the chamber X or, as shown, in the top of the brass 26, while the opening  $x'$  is directly above the collar 23, at one side of the same. By thus confining the portion of lubricant in direct contact with the bearing to a limited amount I avoid agitating and heating the whole body,



and I have found that by this arrangement of bearings and lubricating means I have reduced the amount of lubricant required seventy-five percent. Further, I have found that there is practically no heating of the bearings, dust is completely excluded, there is no unequal wear of the parts, and the machine runs with less power and less interruption for repairs. Each chamber may be filled through an opening closed by a plug 33. When access to the interior of the bearing is required, it can be had by unbolting the flanges 27 27 and removing the upper sections of the box and bearing.

The lower part of the box is constructed in any suitable manner. As shown it has a packing 10 confined by a screw-gland 11. It will be evident that the bearing for the upper end of the shaft 20 may be constructed like those of the shafts 30. It will also be evident that the improved bearing may be used with shafts other than those of grinding-mills.

Without limiting myself to the precise construction shown, I claim—

1. The combination with a shaft having a collar below its end, of a box inclosing the end of the shaft, a brass fitted within the box below said collar, and a second brass fitted within the box above the collar, substantially as described.

2. The combination with a shaft having a collar below its end, of a box inclosing the end of the shaft, a brass fitted within the box below said collar, and a second brass fitted within the box above the collar, oil-chambers within the box, one with an opening leading to the collar and the other with an opening

leading to the upper brass, substantially as described.

3. The combination of the shaft, its collar below the end, a box and brass fitting the shaft below the collar, a brass fitting the upper end of the shaft, lubricating-chambers and contracted openings between the latter and the bearings, substantially as described.

4. The combination of the shaft-collar, brass D having a flange 29, brass 26 having a closed end with an opening  $x$ , and box with lubricating-chambers inclosing said shaft and bearings, substantially as described.

5. The combination of the shaft-collar, brass D having a flange 29, brass 26 having a closed end with an opening  $x$ , and box with lubricating-chambers inclosing said shaft and bearings, and consisting of two connected parts, substantially as described.

6. The combination of the shaft-collar, brass D having a flange 29, brass 26 having a closed end with an opening  $x$ , and box with lubricating-chambers inclosing said shaft and bearings, and packing at the lower end of the box, substantially as described.

7. The combination in a grinding-mill of the shaft-collar, brass 26, having a closed end with an opening  $x$ , and box provided with trunnions and with lubricating-chambers inclosing said shaft and bearings, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN CALHOUN CLARK.

Witnesses:

A. A. SMITH,

GEO. S. OBEAR, Jr.