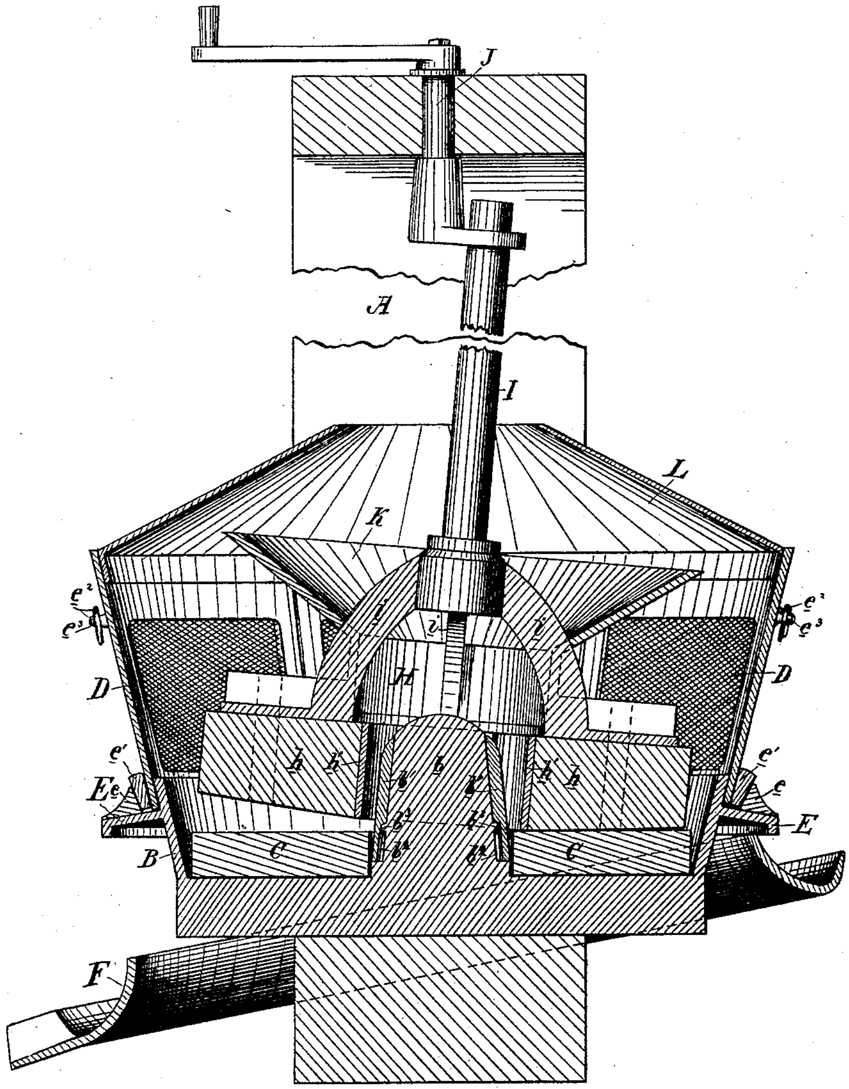
(No Model.)

R. FORBES.

PULVERIZING MILL.

No. 342,506. Patented May 25, 1886.



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UNITED STATES PATENT OFFICE.

ROBERT FORBES, OF DOWNIEVILLE, CALIFORNIA.

PULVERIZING-MILL.

SPECIFICATION forming part of Letters Patent No. 342,506, dated May 25, 1886.

Application filed November 2, 1885. Serial No. 181,725. (No model.)

To all whom it may concern:

Be it known that I, ROBERT FORBES, of Downieville, Sierra county, State of California, have invented an Improvement in Pulverizing-Mills; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of pulverizing-mills in which an eccentrically moving or wabbling muller operates in an annular space in a pan or vessel and around a central guiding-core, and my pulverizing mill comprises a shoe for the central core, a directing-flange around the exterior of the pan adapted to convey the screened material into an underlying circular or annular discharge-trough, means for securing the parts of the sectional screen together and to the pan, a hopper for the muller, a shield for the top of the screen, and in removable wearing-blocks for the inner surfaces of the shoes of the annular muller, all of which I shall hereinafter fully describe and claim.

The object of my invention is, by the use of the various improvements I have made, to render more perfect a machine of this class.

Referring to the accompanying drawing, the figure is a vertical section of my pulverizing-mill.

A is the frame-work of the machine.

B is a pan or vessel having sloping sides and a central conical core, *b*, by which is formed an annular or ring-shaped space, in which are seated the removable dies C.

D is the sectional screen secured to and continuing the inclination of the sides of the pan. On the rim of the pan is an exterior flange, E, under which is an annular discharge-trough, F, set on an angle.

H is the muller, made of an annular shape and provided with shoes *h*. The muller is secured by a spider, *i*, to a shaft, I, the upper end of which is eccentrically connected with a crank-shaft, J, whereby the muller has imparted to it a wabbling or eccentric motion within the pan and around the central core. The muller is provided with a hopper, K, and over the edge of said hopper, and fitting snugly upon or within the top of the screen, is an annular shield, L. This screen L is made preferably in the form of a truncated cone, its central opening being somewhat smaller than the diameter of the upper portion of the hopper, whereby all liability of the ore falling between the screens and muller is avoided. Around the central core is an annular shoe, *b'*, which may be readily put in place and removed by any suitable means, as, for example, by the slots b^2 in its inner surface engaging the pins or studs b^3 in the central core. On the inner surfaces of the muller-shoes are the wearing-blocks *h'*, which are adapted to be renewed when necessary, being set therein in any suitable manner, preferably dovetailed.

The screen-sections are secured to the pan and to each other in the following manner: Upon the flange E are cast lugs *e*, opposite the points of meeting of the screen-sections. Wedges *e'* are driven in between the outer surfaces of the bases of the screen-sections and these lugs, whereby said sections are forced against the exterior surface of the pan while resting upon the flange E. The tops of the sections are secured by staples e^2, driven down over lugs e^3, cast on the meeting edges of the screen-sections.

The operation of the machine is as follows: The annular muller fits down into the annular space of the pan, and the material to be crushed is fed into the hopper K of said muller and passes down through it, finally working its way between the shoes and dies. The shield L, by extending over the hopper, as shown, prevents any material from getting down between the periphery of the muller and the screen-sections. The muller is given an eccentric or wabbling motion by means of the crank-shaft J above, and it is guided in this motion about the central core, *b*, of the pan.

As considerable wear occurs between the inner surface of the muller and the central core, it is necessary to provide the latter with a shoe of some kind. This has been done heretofore by independent blocks, which are separated from each other and serve also to center the muller. I have found that in using said blocks the material is apt to get between them in rather large pieces, which are not crushed. I have therefore discarded the blocks and use a continuous-ring shoe, such as I have described, which effectually serves to protect the central core, guides the muller as well,

and acts as a perfect crushing-surface. The wearing-blocks h' on the inner surfaces of the muller-shoes provide for the wear on this portion of the muller, which takes place between the shoes and the central core.

The means for securing the screen-sections together are simple and effective, providing for the ready removal and renewal of any section. The flange E directs the material discharged from the pan into the trough below. The hopper of the muller properly directs the material fed to the machine and prevents any waste.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A pulverizing-mill comprising the pan B, having a central core forming with the sides thereof an annular space, suitable dies in said space, the sectional screens D, secured to and forming a continuation of the sides of the pan, the annular eccentrically moving or wabbling muller H, suitable shoes secured thereto, the hopper K on top of the muller, and the shield L, substantially as herein described.

2. A pulverizing-mill comprising the pan or vessel B, having an exterior flange, E, the eccentrically moving or wabbling muller H, the sectional screen D, secured to and forming a continuation of the sides of the pan, means for securing the sections of said screen together and to the pan, consisting of the lugs e on the flange and the wedges e', bearing between said lugs and the meeting edges of the sections of the screen, the lugs e^3 on the screen-sections and the staples e^2, binding on said lugs, substantially as herein described.

3. A pulverizing-mill comprising the pan or vessel B, having a central core, b, provided with an annular or ring shoe, b', the dies C in the pan, the flange E around its exterior, the trough F under the flange, the sectional screen D, secured to the sides of the pan by wedges and staples, as described, the muller H, provided with shoes h, having wearing-blocks h' on their inner surfaces, the hopper K on the muller, the shield L, and the means for imparting a wabbling motion to said muller, consisting of the shaft I, connected with the muller, and the crank-shaft, J, connected with the shaft I, all arranged and adapted to operate substantially as herein described.

In witness whereof I have hereunto set my hand.

ROBERT FORBES.

Witnesses:

S. H. NOURSE,

H. C. LEE.