(No Model.)

R. J. CUNNACK.

APPARATUS FOR REDUCING MINERALS AND METALLIC ORES.

No. 307,180. Patented Oct. 28, 1884.

Fig. 1.

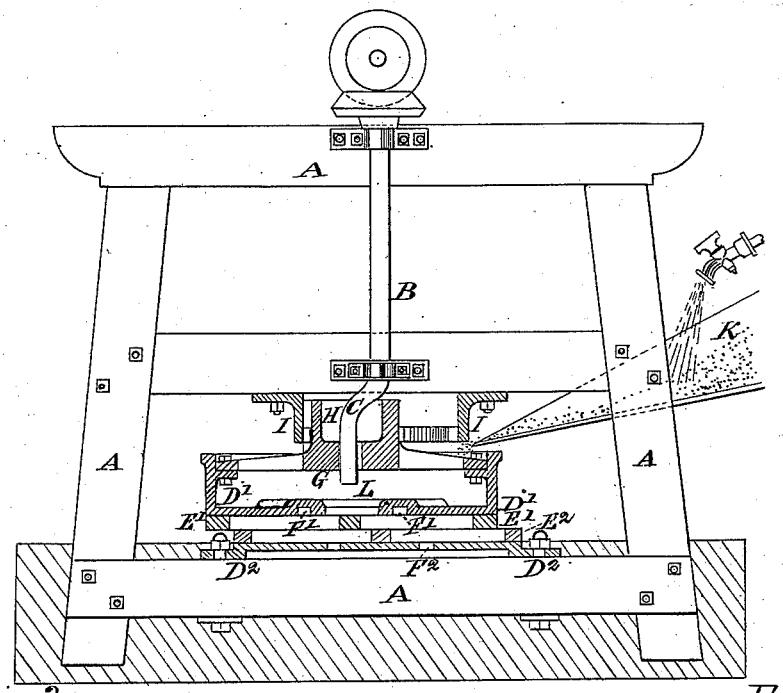


Fig. 3.

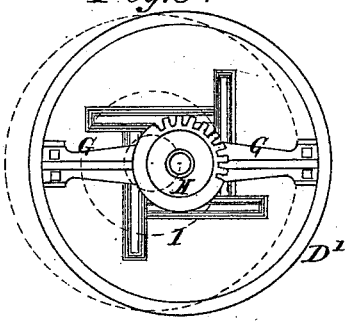


Fig. 2.

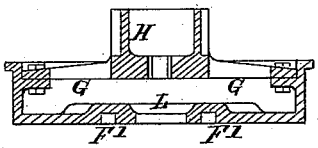


Fig. 7.

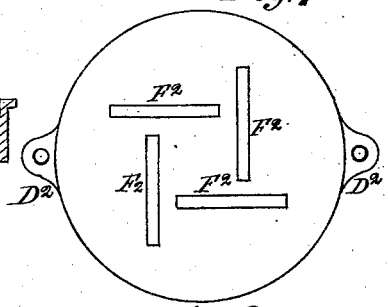


Fig. 5.

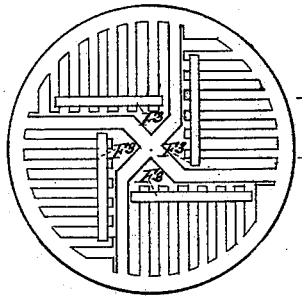


Fig. 4.

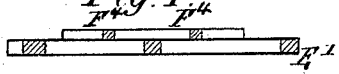
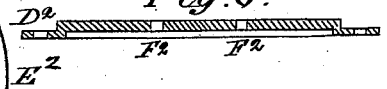


Fig. 6.



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UNITED STATES PATENT OFFICE.

RICHARD JOHN CUNNACK, OF HELSTON, COUNTY OF CORNWALL, ENGLAND.

APPARATUS FOR REDUCING MINERALS AND METALLIC ORES.

SPECIFICATION forming part of Letters Patent No. 307,180, dated October 28, 1884.

Application filed July 30, 1884. (No model.) Patented in England August 5, 1882, No. 3,735.

To all whom it may concern:

Be it known that I, RICHARD JOHN CUNNACK, a subject of the Queen of Great Britain, residing at Helston, in the county of Cornwall, in that part of Great Britain called England, merchant, have invented a new and useful Improvement in Apparatus for Reducing Minerals and Metallic Ores, (for which I have obtained a patent in Great Britain, No. 3,735, bearing date August 5, 1882,) of which the following is a specification.

This invention relates to that class of grinding-mills in which two grinding disks or plates are employed, one being stationary and the other rotating eccentrically over it.

The said invention consists, chiefly, in the combination of a stationary grinding-plate and a movable grinding-plate with a pan erected on the latter, a cross-bar, and pinion carried by said pan, a fixed internally-toothed wheel, which engages with said pinion, and a driving-shaft having a crank which engages with said cross-bar, substantially as hereinafter set forth.

It also consists in the peculiar construction of the removable shoes and the means for attaching the same to the pan and the bed, respectively, as hereinafter set forth in the claims.

In order that the invention may be better understood, I will, by the aid of the accompanying drawings, proceed more fully to describe the means employed by me in carrying the same into effect.

Figure 1 shows a vertical section of apparatus arranged according to my invention. Figs. 2, 3, 4, 5, 6, and 7 show parts thereof in detail.

In each of the figures the same letters of reference apply to corresponding parts.

A A represent the framing of the apparatus; B, the main or driving shaft driven by suitable gear from a steam-engine or other power; C, the crank-pin attached to the shaft B; D′, the movable pan with its renewable shoe or grinding-plate E′.

D^2 represents the lower or fixed bed-plate with its renewable shoe or grinding-plate E^2. The bed D^2 is provided with four long openings or slots, F^2, Figs. 6 and 7, arranged approximately in the form of a square, and adapted to fit four similarly-shaped and similarly-arranged projections, F^3, on the under face of grinding-plate E^2, Fig. 5. The under face of pan D′ is in like manner provided with four recesses, F′, similar in shape and arrangement to slots F^2. These recesses F′ receive the corresponding projections, F^4, Fig. 4, on the upper face of the shoe E′. These shoes E′ E^2 are interchangeable, and may be easily removed if worn.

G is a cross-bar with pinion H attached thereto for gearing into the teeth of the internal toothed wheel I, fixed to the frame A, so as to cause the pan D′ with its shoe to revolve about the crank-pin C.

K represents the chute, through which the material to be treated is conducted into the pan D′ by the action of the stream of water.

L represents the opening in the center of the bottom of the pan D′, through which the material passes to between the grinding-surfaces.

Figs. 2 and 3 represent a section and plan of the movable pan with cross-bar and pinion H. The pinion H is made deep enough to allow for the wearing of the grinding-plates E′ E^2.

Fig. 4 represents a vertical sectional view in detail of the upper shoe or grinding-plate, E′, and Fig. 5 represents a bottom view of the lower shoe or grinding-plate, the construction of the two being the same.

Figs. 6 and 7 show section and plan of the bed-plate D^2.

Having thus described my invention and means by which I carry the same into effect, I would have it understood that I do not confine myself to the precise details shown and described, as variations may be made therein without departing from the peculiar character of my invention.

I am aware that it is not broadly new to construct, combine, and arrange grinding disks or plates so that they shall operate eccentrically to one another, and also that it is not broadly new to provide grinding-disks with holes or recesses. Therefore I do not claim such devices, broadly.

What I do claim is—

1. The stationary grinding-plate E^2 and movable grinding-plate E′, in combination

with the pan D′, erected on the latter, the cross-bar G and pinion H, carried by said pan, the fixed internally-toothed wheel I, which engages with said pinion, and the driving-shaft B, having a crank, C, which engages with said cross-bar, substantially as set forth.

2. The stationary bed D^2, having the four slots F^2 arranged approximately in a square, as shown, in combination with shoe E^2, having projections F^3, adapted to fit said slots, and a grinding-plate or shoe in contact with the grinding-face of shoe E^2, substantially as set forth.

3. The interchangeable removable shoes or grinding-plates E' E^2, provided with the projections F^3 F^4, in combination with the bed D^2, having slots F^2, which receive projections F^3, and the pan D′, having recesses F′, which receive projections F^4, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

RICHARD JOHN CUNNACK.

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