(No Model.)

E. M. BOWICK.

MACHINE FOR CRUSHING ORES.

No. 362,198. Patented May 3, 1887.

Fig. 1.

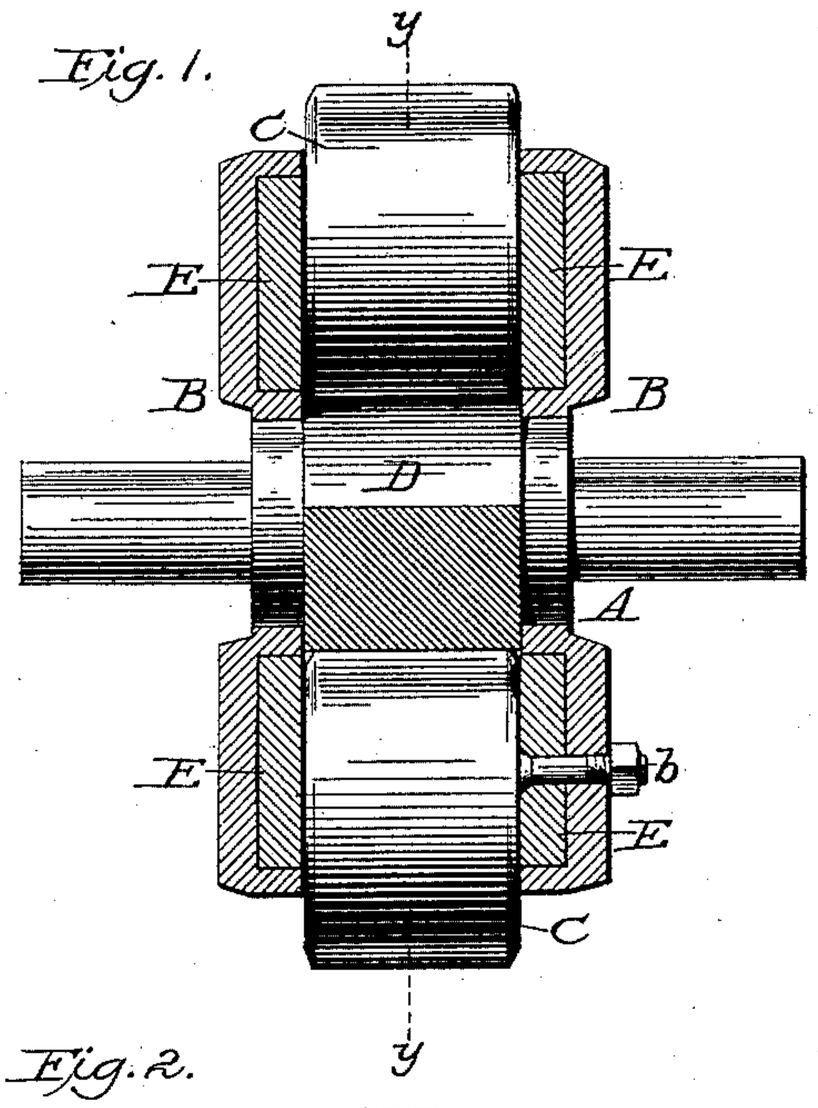


Fig. 2.

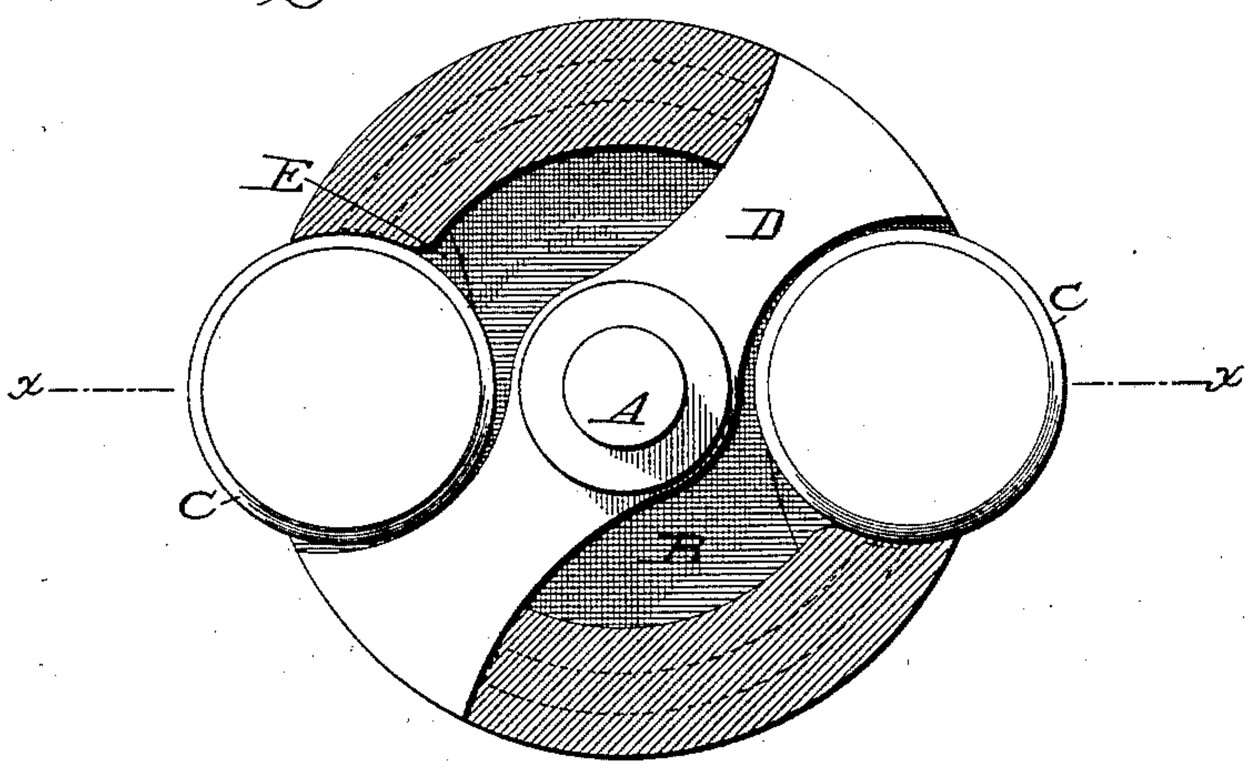
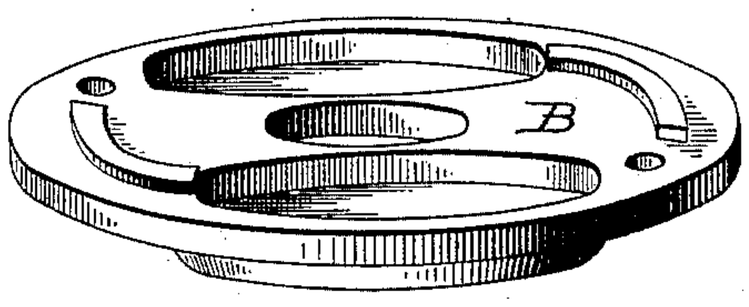


Fig. 3.



Witnesses:

James F. DuHamel.

W. R. Kennedy.

Inventor;

E. M. Bowick.

By his atty.

Phil. T. Dodge.

UNITED STATES PATENT OFFICE.

EDWARD MARION BOWICK, OF CHARLESTON, SOUTH CAROLINA.

MACHINE FOR CRUSHING ORES.

SPECIFICATION forming part of Letters Patent No. 362,198, dated May 3, 1887.

Application filed October 18, 1886. Serial No. 216,533. (No model.)

To all whom it may concern:

Be it known that I, EDWARD MARION BOWICK, of Charleston, in the county of Charleston and State of South Carolina, have invented certain Improvements in Machines for Crushing Ores, &c., of which the following is a specification.

The present invention has reference to that class of crushing or pulverizing machines which are commonly known in the art as "Frisbee-Lucop machines," which consist of a rotary head carrying peripheral rollers, which travel on the inner surface of a circular casing. In machines of this type as heretofore constructed much difficulty has been experienced by reason of the fact that the ends of the rollers rapidly wear away the faces of the cheek-plates by which they are retained in position in the head, this wear being followed by a displacement of the rollers and by a change in their form. The aim of the present invention is to reduce this wear, and to provide for the convenient and inexpensive renewal of the wearing-surfaces when necessary; and to this end it consists, essentially, in the combination, with the rollers and cheek-plates, of intermediate removable wearing-plates, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a transverse central axial section through the rotary head provided with my improvement, on the line *x x* of Fig. 2. Fig. 2 is a transverse section on the line *y y* of Fig. 1. Fig. 3 is a perspective view of one of the side or cheek plates.

Referring to the drawings, A represents the central shaft; B B, the two side or cheek plates encircling the shaft; C C, the two crushing-rolls seated between the cheek-plates, and D the central portion of the head acting against the periphery of the rolls to maintain them in position.

In their general construction and arrangement the foregoing parts are similar to those in existing machines.

In machines as ordinarily constructed the cheek-plates B are necessarily made of soft metal possessing high tensile strength in order to prevent them from being fractured by the shocks and strains to which they are subjected when the machine is in action. In practice it is found that these soft-metal plates wear away rapidly opposite the ends of the rollers which bear thereon, and which are retained in position thereby, the result being that the rollers are permitted to move out of their proper position, so that the wear soon destroys their cylindrical form. In order to avoid this difficulty, I provide the cheek-plates on their inner faces with removable wearing-plates E, of chilled iron or equivalent hard material, made of such form and seated in such position as to bear against the ends of the rolls and receive the entire or substantially the entire wear. I make these plates of an oblong or elliptical form, and seat them in pockets formed for the purpose in the inner faces of the cheek-plates B, as shown in the several figures. The form of these pockets is plainly illustrated in Figs. 1 and 3. When inserted in these pockets, the plates will be held in position by the pressure of the rollers against their inner faces; but, if desired, fastening-bolts or other equivalent fastenings may be employed to secure and adjust them.

In Fig. 1, *b* represents a bolt applied for this purpose. When worn on one side, the plates may be reversed.

By the use of the hardened wearing-plates in connection with the soft-metal cheek-plates I am enabled to maintain the strength of the machine, to give the same greater durability, and to maintain the rollers in a true cylindrical form, so that they will perform their duty in a perfect manner.

I am aware that removable wearing-plates and wearing-surfaces have been applied in various forms and in various classes of machinery; but I am not aware that any one has heretofore provided a mill of the present type with removable or reversible hardened wearing-plates seated in a pocket in the cheek-plates.

Having thus described my invention, what I claim is—

1. In a grinding-mill, the combination of the rotary body D, the cylindrical rolls C, the recessed cheek-plates B, and the wearing-

plates E, inserted in said recesses opposite the ends of the rolls.

2. In a grinding-mill, the combination, with the body D, cylindrical rolls C, and recessed cheek-plates B, of the wearing-plates E, seated in the recesses and adapted for reversal therein, as described and shown.

In testimony whereof I hereunto set my hand, this 21st day of September, 1886, in the presence of two attesting witnesses.

EDWARD MARION BOWICK.

Witnesses:

A. M. LEE,

ELLISON A. SMYTH, Jr.