No. 673,768. Patented May 7, 1901.

C. R. FLEMING.

CRUSHING ROLLS.

(Application filed June 9, 1900.)

(No Model.)

Fig. 1.

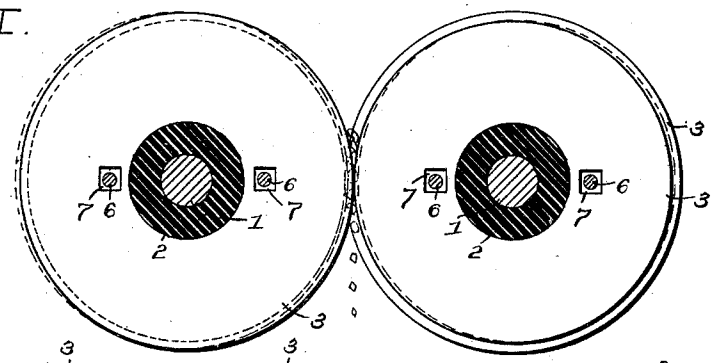


Fig. 2.

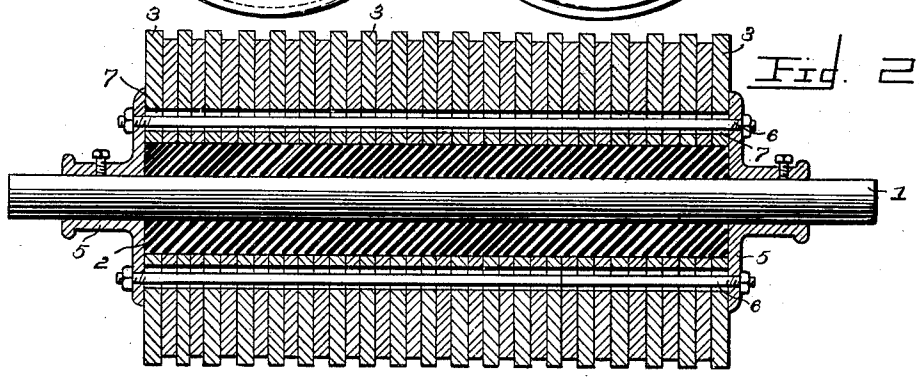
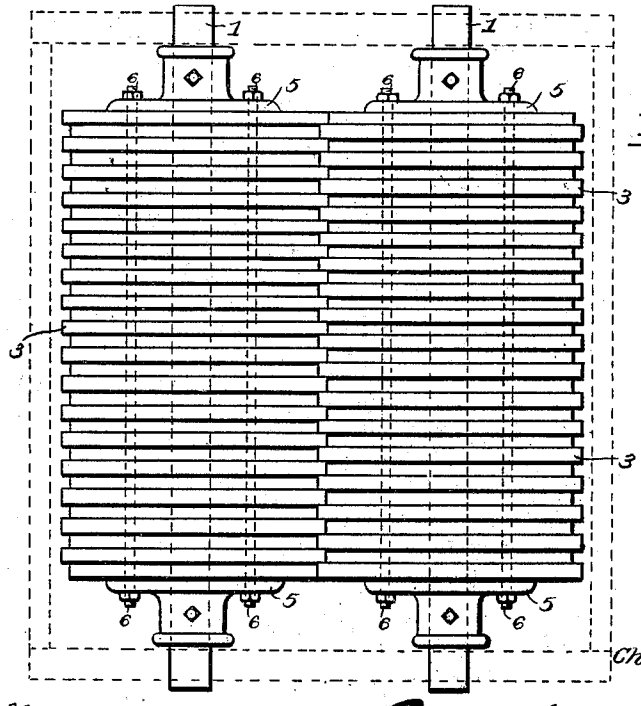


Fig. 3.



Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES R. FLEMING, OF BLACK WARRIOR, ARIZONA TERRITORY, ASSIGNOR TO THE DARIUS GREEN MINING COMPANY, OF TUCSON, ARIZONA TERRITORY.

CRUSHING-ROLL.

SPECIFICATION forming part of Letters Patent No. 673,768, dated May 7, 1901.

Application filed June 9, 1900. Serial No. 19,730. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. FLEMING, a citizen of the United States, residing at Black Warrior, in the county of Gila and Territory of Arizona, have invented a new and useful Crushing-Roll, of which the following is a specification.

My invention is an improvement in crushing-rolls designed to work clay ground, sand, gravel, and other similar formations containing lumps and particles of a harder formation which it is not desirable to crush, the rolls being especially adapted for crushing certain classes of ore.

The object of my invention is to effect improvements in the construction of the rolls whereby particles of a hard formation which it is not desirable to crush will pass through the rolls without affecting the efficient operation thereof on the softer particles.

My invention consists in the peculiar construction and combination of devices hereinafter fully set forth, and pointed out in the claim.

In the accompanying drawings, Figure 1 is a transverse sectional view of a pair of crushing-rolls constructed in accordance with my invention. Fig. 2 is a longitudinal sectional view of one of the rolls. Fig. 3 is a top plan view of a pair of my crushing-rolls.

On the roll-shaft 1 is placed a cylindrical core-spring 2, which may be made of india-rubber or any other suitable elastic material, or the same may be made of metal and suitably constructed to render the same elastic at all points of its surface. On the said core-spring is placed a series of circular disks 3, the same having central openings through which the core-spring passes. The said openings are of the same size as the diameter of the core-spring, the latter fitting snugly in said opening, as indicated in the drawings. A pair of heads 5 are secured firmly on the axle-shaft 1 at the ends of the roll, as shown, or in any other suitable manner, the said heads bearing against the end disks and serving to maintain the disks in contact with each other throughout the roll. Bolt-rods 6 extend through openings 7 in the series of disks and through openings in the heads 5 and serve to clamp the heads firmly on the ends of the core-spring and against the end disks. The said bolt-rods are preferably arranged diametrically opposite each other, as shown, and usually two of such rods will suffice, as indicated in the drawings; but the number thereof may be increased as may be required. The openings 7 in the disks through which the said bolt-rods pass are considerably larger than said bolt-rods, and said openings are of suitable shape, either angular, as here shown, or circular or curved. The disks 3 are unequal in size alternately throughout the series, the smaller disks being interposed between the larger disks, as indicated in the drawings, thereby providing the roll with a corrugated surface. When a pair of rolls are combined in operative relation, as shown in Figs. 1 and 3, the larger disks of one roll enter the spaces between the larger disks of the opposing roll. The core-spring maintains the series of disks on the roll concentrically with the axis thereof under normal conditions, but permits of the independent eccentric movement of one or more of the disks under abnormal conditions, as hereinafter indicated.

When a pair of my improved rolls are arranged in operative relation to each other, as hereinbefore described, the same are efficient in crushing soft ores and friable ores and the like formations. When particles of a harder formation which it is not desirable to crush are encountered by the rolls, such of the co-acting disks as are in contact with such harder particles are displaced thereby eccentrically with relation to the axes of the rolls against the tension of the core-springs thereof, thus allowing such harder particles to pass between the rolls without being crushed, whereupon the disks are caused by the springs to instantly reassume their normal concentric positions with relation to the axes of the rolls. It will be understood that by thus providing the crushing-rolls with independently eccentrically movable disks and springs to restore the same to their normal position concentric with the axis of the rolls the latter are adapted to yield to permit the passage

between them of hard unyielding substances without impairing their efficiency in crushing softer particles or substances while said hard particles or substances are passing between them.

Having thus described my invention, I claim—

A pair of coacting crushing-rolls, each comprising a shaft, a cylindrical core-spring thereon, a series of disks on said core-spring, movable eccentrically with relation to the axis of the roll independently of each other, and said core-spring serving to normally retain said disks concentrically with relation to the axis of the roll, each alternate disk being of greater diameter than the intermediate disk, said disks having transverse registering openings, heads secured on the shaft and bearing against the ends of the core-spring and the outer disks, and bolt-rods connecting said heads and extending through said openings, the larger disks of each roll engaging the smaller disks of the other, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the pressence of two witnesses.

CHAS. R. FLEMING.

Witnesses:
SYLVIA KENNEDY,
GEO. H. RICHEY.