

No. 822,913.

PATENTED JUNE 12, 1906.

M. P. BOSS.
CRUSHING MILL.
APPLICATION FILED FEB. 23, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

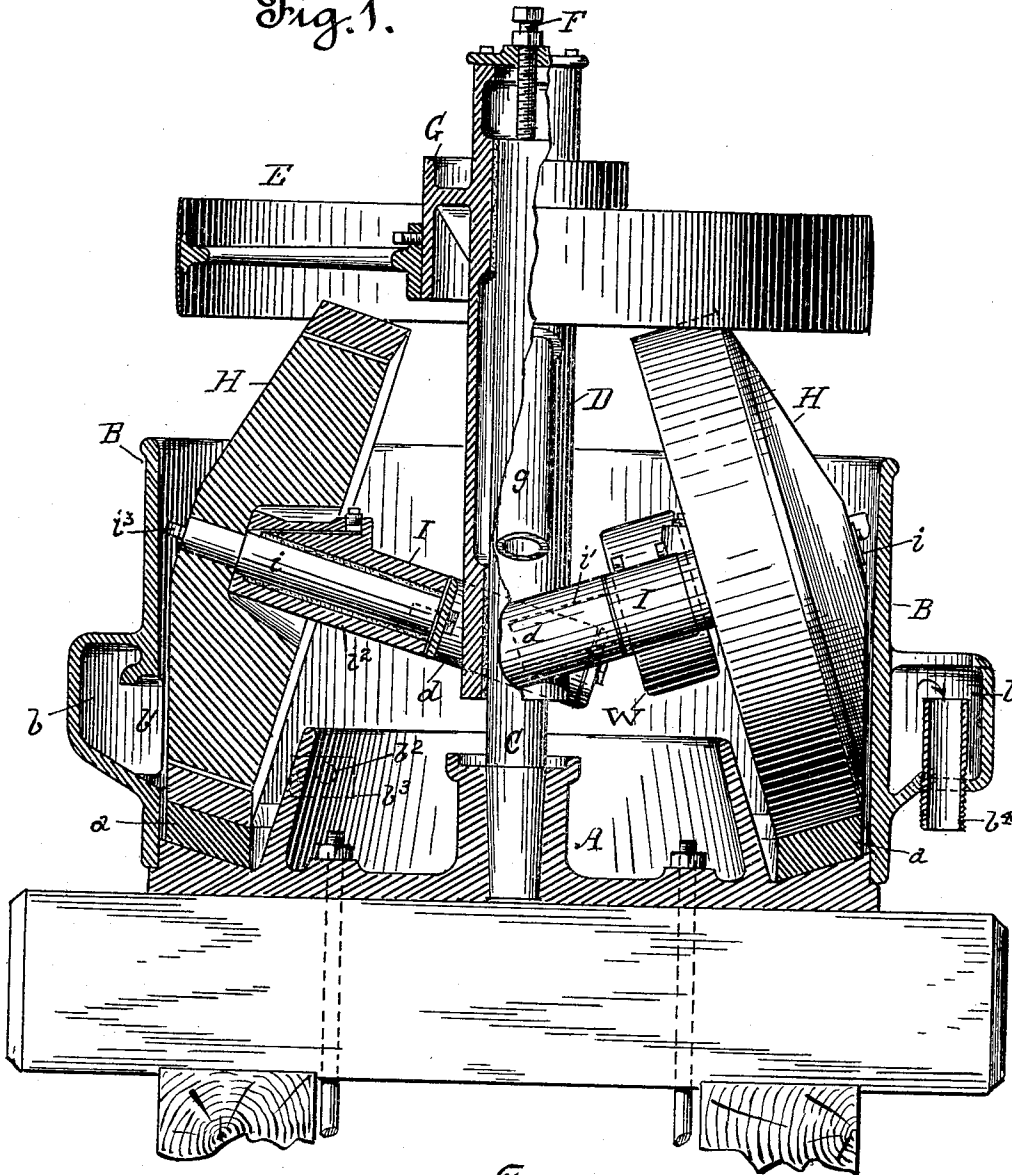
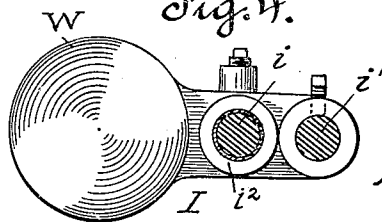


Fig. 4.



Witnesses.

H. Monteverde

J. Compton.

Inventor.

Martin P. Boss
by *Wm F. Booth*
his Attorney.

No. 822,913.

PATENTED JUNE 12, 1906.

M. P. BOSS.
CRUSHING MILL.
APPLICATION FILED FEB. 23, 1906.

2 SHEETS—SHEET 2.

Fig. 2.

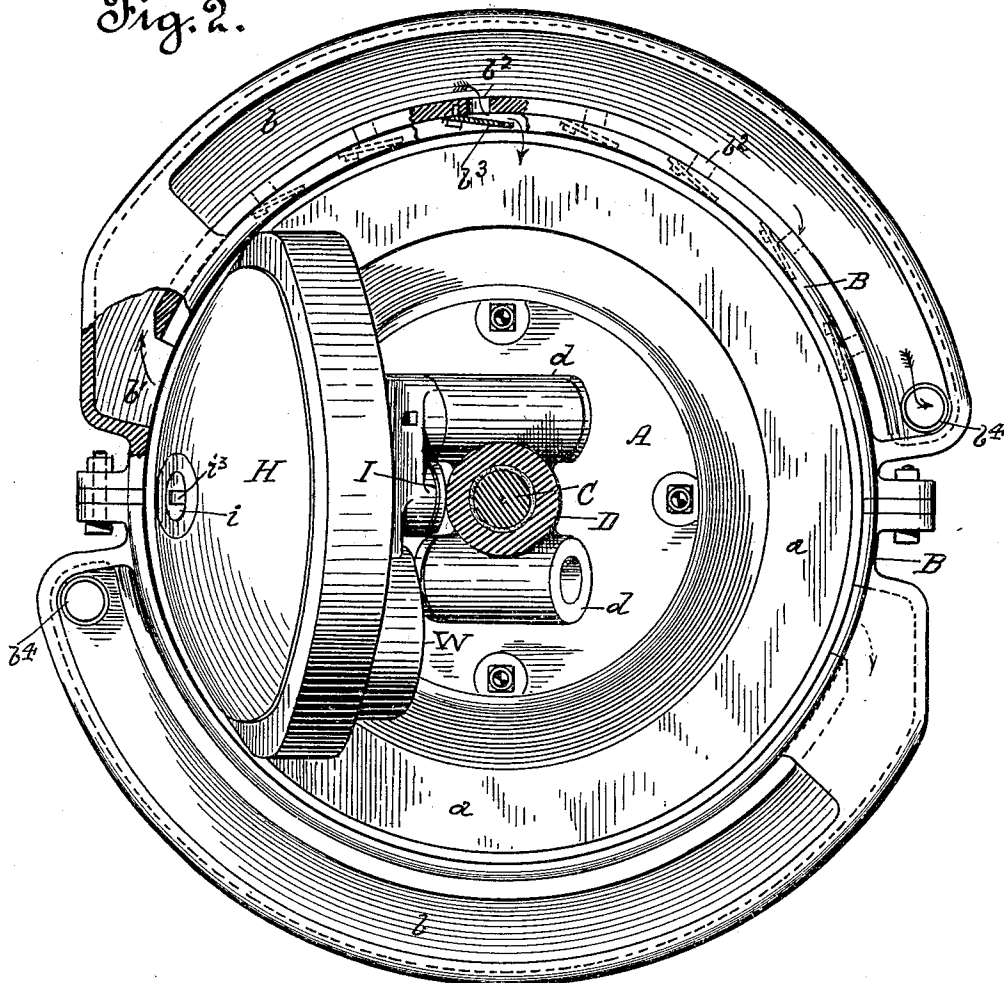
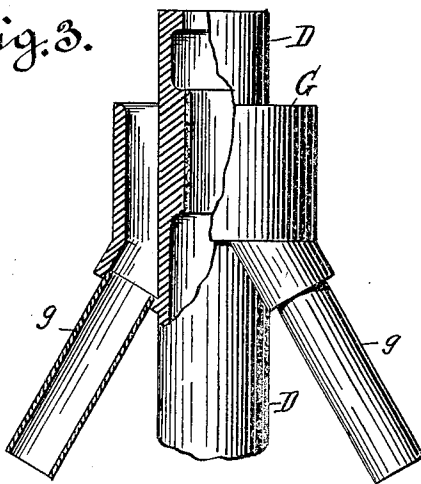


Fig. 3.



Witnesses.

H. Monteverde.

J. Compton.

Inventor.

Martin P. Boss

by Wm. F. Booth

his Attorney.

UNITED STATES PATENT OFFICE.

MARTIN P. BOSS, OF SAN FRANCISCO, CALIFORNIA.

CRUSHING-MILL.

No. 822,913.

Specification of Letters Patent.

Patented June 12, 1906.

Application filed February 23, 1905. Serial No. 246,842.

To all whom it may concern:

Be it known that I, MARTIN P. BOSS, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Crushing-Mills; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to crushing-mills in which rollers, mullers, or other forms of crushers or grinders are employed, and especially to roller crushing-mills.

My invention has two main objects—namely, to avoid the use of the expensive screens which are commonly fitted to the pan-rim and to relieve to the extent desired the weight of the driver upon the center post or shaft.

To attain these objects, my invention consists, first, in a novel separating overflow-channel formed or connected with the pan-rim, whereby the finer material is separated from the coarser and discharged while the coarser material is returned to the pan for further crushing, and, second, in a novel crank, by which the crushing-rollers are connected with the driver.

Referring to the accompanying drawings, Figure 1 is a vertical section, partly in elevation, of my crushing-mill. Fig. 2 is a top plan, partly broken, of the same, one roller being omitted and the driver and center post being in horizontal section. Fig. 3 is an elevation, partly broken, of the driver with the hopper and spouts. Fig. 4 is a side view of the roller-crank.

A is the pan. B is its rim.

C is the stationary or fixed center post or shaft.

D is the driver fitted rotatably upon the post, and E is the driving-pulley. The driver is suspended from the post by means of the top bearing-screw F, Fig. 1.

G is the feed-hopper of the driver, and *g* represents the feed-spouts, Fig. 3.

H represents the crushing-rollers, which travel on the die *a* in the pan.

It is usual in these mills to fit screens to openings in the pan-rim, the purpose of the screens being to effect a separation of the finely-ground material from the coarser, permitting the discharge of the former while retaining the latter in the pan for further crushing. These screens are costly, are subject to wear, and are expensive to replace. By my improvement I dispense with them entirely

by providing other means less expensive and more durable for effecting the necessary separation of the finer from the coarser material. The pan-rim B is a close one—that is, solid, except for the communications hereinafter stated—and said rim at one or more places in its circumference (shown in Fig. 2 as on both sides) is formed or provided with an outer channel *b*. This channel at its beginning communicates with the interior of the pan through an opening *b'*, sufficiently capacious to allow the material to freely enter it from the pan. Throughout its length the channel further communicates with the pan by a number of relatively smaller return-openings *b*² at the bottom of the channel, said return-openings being guarded within the pan by fender-plates *b*³, closed at one end and open at the other, the closed end facing the direction of the movement of the pan contents, so that while the material will return from the channel *b* through the openings *b*², as indicated by the arrows in Fig. 2, it will not, on account of the fender-plates, pass out through them, but will be washed or forced by. Within the channel *b* near its end is fitted an overflow-pipe *b*⁴, which is adjustably mounted, as by screwing, so that it may be raised up or down to vary the character of the overflow. The channel *b* at its entrance end is best covered, as shown, so that the material will not splash out; but for the remainder of its length it may be uncovered, Figs. 1 and 2. The material in the pan is constantly forced through the opening *b'* into the channel *b*. In this channel a settling separation takes place, the coarser material passing back into the pan through the bottom openings *b*², while the finer material confined in the channel by the close rim overflows through the pipe *b*⁴.

In this class of mills the crushing-rollers are often connected with the driver by a swinging crank which permits the rollers to ride over inequalities. It will be seen by reference to Figs. 4 and 1 that the crank I has secured to it a pin *i'*, which forms the pivotal connection between it and the driver D by means of said pin fitting in the inclined sleeve *d* at the base of said driver. The crank has also a journal-sleeve *i*² to receive the axle *i*, which is firmly secured, as by means of the key *i*³, to the roller H, Figs. 1 and 2. The axle *i* is thus fast in the roller and journals in the sleeve *i*² of the crank. This construction is the better practice in that when the crank carries the axle and the roller is jour-

naled on said axle some exterior means, such as an end cap, is necessary to keep dirt out of the journal; but by having the axle fast in the roller and journal in the sleeve of the crank the bearing is an inner one, as seen in Fig. 1, and can be better protected. The essential improvement in the crank consists in the counterweight W, which is secured to or formed with the crank. This counterweight, as seen in Figs. 1 and 2, is so disposed that while it adds to the crushing-weight of the roller it acts against the weight of the driver, counterbalancing as far as desired said driver, and thus relieving the bearing of the driver on the center post.

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

1. In a crushing-mill, a pan having a close rim with a channel on its exterior, said channel having an entrance communication at one end, with the interior of the pan, an overflow to the exterior of the pan at the other end, and return communications intermediate its ends from its lower portion into the interior of the pan.

2. In a crushing-mill, a pan having a close rim with a channel on its exterior, said channel having an entrance communication at one end, with the interior of the pan, an adjustable overflow to the exterior of the pan at the other end, and return communications intermediate its ends, from its lower portion into the interior of the pan.

3. In a crushing-mill, a pan having a rim with an exterior channel, said channel having at one end an entrance communication with the pan, and return communications into the pan beyond the entrance communication, fender-plates disposed to guard against an outward flow from the pan through

said return communications, while permitting an inward flow therethrough, and an overflow from the other end of said channel.

4. In a crushing-mill, a pan having a rim with an exterior channel, said channel having at one end an entrance communication with the pan, and return communications into the pan beyond the entrance communication, fender-plates disposed to guard against an outward flow from the pan through said return communications, while permitting an inward flow therethrough, and an adjustable overflow from the other end of said channel.

5. In a roller-crushing mill, a swinging crank for journaling the roller and pivotally connecting it with the driver, said crank having a weight disposed to counterbalance the driver.

6. In a crushing-mill, and in combination with a driver having a top bearing by which it is suspended, and a crushing-roller, a crank for journaling the roller and pivotally connecting it with the driver, said crank having a weight disposed to counterbalance the driver.

7. In a crushing-mill, and in combination with a pan, a fixed center post, a rotating driver journaled upon the post, a top bearing mounting the driver on the post, and a roller operating in the pan, a crank for journaling the roller and pivotally connecting it with the driver, said crank having a weight disposed to counterbalance the driver.

In witness whereof I have hereunto set my hand.

MARTIN P. BOSS.

Witnesses:

J. COMPTON,
D. B. RICHARDS.