

(No Model.)

C. RALEIGH.
STAMP BATTERY.

No. 551,448.

Patented Dec. 17, 1895.

Fig. 1.

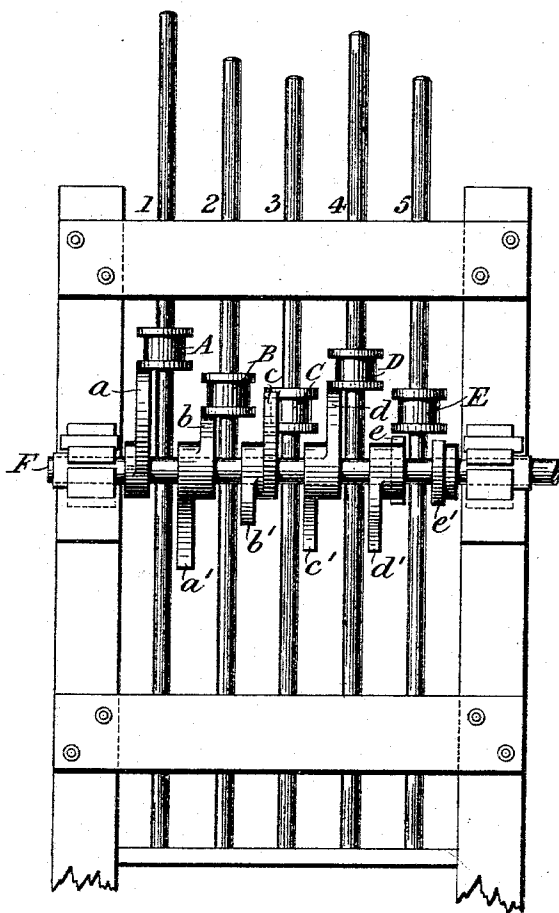


Fig. 2.

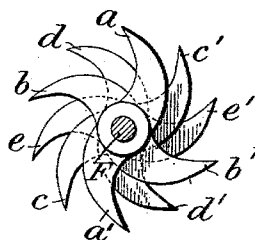


Fig. 3.



Witnesses:

J. J. Rapin.
P. Varnals.

Inventor:

Charles Raleigh

UNITED STATES PATENT OFFICE.

CHARLES RALEIGH, OF JOHANNESBURG, SOUTH AFRICAN REPUBLIC.

STAMP-BATTERY.

SPECIFICATION forming part of Letters Patent No. 551,448, dated December 17, 1895.

Application filed June 25, 1892. Serial No. 438,051. (No model.) Patented in England February 19, 1892, No. 3,289; in India April 5, 1892, No. 88; in Victoria April 6, 1892, No. 9,558; in New South Wales April 8, 1892, No. 3,693; in Queensland April 12, 1892, No. 2,048; in New Zealand April 22, 1892, No. 5,522, and in Canada July 27, 1892, No. 39,471.

To all whom it may concern:

Be it known that I, CHARLES RALEIGH, a subject of the Queen of Great Britain and Ireland, residing at Johannesburg, in the South African Republic, have invented new and useful Improvements in or Applicable to Stamp-Batteries, (in respect whereof I have obtained Letters Patent in Great Britain, No. 3,289, dated February 19, 1892; in India, No. 88, dated April 5, 1892; in Victoria, No. 9,558, dated April 6, 1892; in New South Wales, No. 3,693, dated April 8, 1892; in Queensland, No. 2,048, dated April 12, 1892; in New Zealand, No. 5,522, dated April 22, 1892, and in Canada, No. 39,471, dated July 27, 1892,) of which the following is a specification.

This invention relates to stamp-batteries for crushing gold ores and other substances; and it consists in certain improvements in the apparatus for working the stamps.

In the accompanying drawings, Figure 1 is a front elevation of the upper part of a stamp-battery constructed according to my invention. Fig. 2 is a side elevation of the cam-shaft and cams, Fig. 3 being a side elevation of one of the cams.

Stamp-batteries or crushing-mills usually comprise a mortar-box containing a number of stamps, (frequently five,) which are lifted, rotated and dropped by an equal number of cams, either single or double armed, keyed on a revolving cam-shaft, the stamps all rotating in the same direction. The ore or substance to be crushed is fed in at the back of the stamps, and, in the process of being crushed, travels from the back to the front of the mortar-box. On account of the stamps all rotating in the same direction, the ore or other substance is driven toward one end of the mortar-box, its passage from the inlet to the outlet being thereby impeded. Owing to the same cause, the journals in which the stems work become worn unequally, and the end thrust on the cam-shaft is in one direction only, instead of being alternately in each direction or counteracted.

In order to insure the ore or other substance remaining properly distributed in the mortar-box during the process of crushing, and to cause the wear to take place evenly on the various bearing-surfaces, I make the

stamps rotate first in one direction and then in the other.

Two separate cams may be placed between each pair of stamps; or a compound cam, (consisting of two single-armed cams cast together side by side in one piece,) which, when mounted between two stamps, will cause the stamps to revolve first in one direction and then in the other, may be used.

The stems 1, 2, 3, 4, and 5 pertaining to the five stamps are each provided with one of the tappets A, B, C, D, and E. The tappets B, C, and D are each acted upon by compound cams having two arms, the tappets A and E being each acted upon by one arm of a double cam and by a single cam.

The action of the parts at each revolution of the cam-shaft F is as follows: The cam *a*, having imparted a rotary motion from left to right to the tappet A and raised it into the highest position, slides off that tappet and allows the first stamp to fall on the material in the mortar-box. The arm *d* of the compound cam *d c'*, having acted in like manner on the tappet D, then releases the fourth stamp. The arm *b* of the cam *b a'* then drops the second stamp, the arm *e* of the cam *e d'* the fifth stamp, and the arm *c* of the cam *c b'* the third stamp. The arm *a'* of the cam *b a'*, having imparted a rotary motion from right to left to the tappet A of the first stamp, drops that stamp. The arm *d'* of the cam *e d'*, having acted in like manner on the tappet D, then releases the fourth stamp; the arm *b'* of the cam *c b'*, the second stamp; the cam *e'*, the fifth stamp, and the arm *c'* of the cam *d c'* the third stamp. Thus the order of fall is 1 4 2 5 3, and each stamp is dropped twice and turned in both directions at every revolution of the cam-shaft F. It will thus be seen that the cam *a* and the arms *d*, *b*, *e*, and *c* turn the stamps successively from left to right, the arms *a'*, *d'*, and *b'* the cam *e'*, and the arm *c'* thereupon coming into operation and turning the stamps successively from right to left.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a stamp-battery or crushing mill, the combination, with a stamp-stem and a tappet mounted thereon, of a cam on one side the stem for engaging with the tappet so as to lift,

turn from left to right and drop the stem, and a cam on the other side the stem for engaging with said tappet so as to lift, turn from right to left and drop said stem, the cams acting alternately, whereby the more regular distribution in the mortar-box of the ore or substance to be crushed is attained and the wear on the various bearing surfaces more evenly divided, substantially as herein set forth.

10 2. In a stamp-battery or crushing mill, the combination, with a series of stamp-stems 1, 2, 3, 4, 5 provided with tappets A, B, C, D, E, of a cam *a* on one side the stem 1 for engaging with the tappet A so as to lift, turn
15 from left to right and drop that stem, a cam or arm *a'* on the other side said stem for engaging with said tappet so as to lift, turn from right to left and drop the said stem, a cam or arm *b* on one side the stem 2 for engaging
20 with the tappet B so as to lift, turn from left to right and drop that stem, a cam or arm *b'* on the other side said stem for engaging with said tappet so as to lift, turn from right to left and drop the said stem, a
25 cam or arm *c* on one side the stem 3 for engaging with the tappet C so as to lift, turn from left to right and drop that stem, a cam or arm *c'* on the other side said stem for engaging with said tappet so as to lift, turn from
30 right to left and drop the said stem, a cam or arm *d* on one side the stem 4 for engaging with the tappet D so as to lift, turn from left to right and drop that stem, a cam or arm *d'* on the other side said stem for engaging with
35 said tappet so as to lift, turn from right to

left and drop the said stem, a cam or arm *e* on one side the stem 5 for engaging with the tappet E so as to lift, turn from left to right and drop that stem, and a cam *e'* on the other side said stem for engaging with said tappet
40 so as to lift, turn from right to left and drop the said stem, whereby the more regular distribution in the mortar-box of the ore or substance to be crushed is attained and the wear on the various bearing surfaces more evenly
45 divided, substantially as herein set forth.

3. In a stamp-battery or crushing mill, the combination, with a series of vertical stamp-stems 1, 2, 3, 4, 5 provided with tappets A, B, C, D, E, of a horizontal cam-shaft F parallel
50 with the row of stamp-stems and carrying a single cam *a* on the outer side of the stem 1, a double cam *a' b* between the stems 1 and 2, a double cam *b' c* between the stems 2 and 3, a double cam *c' d* between the stems 3 and 4,
55 a double cam *d' e* between the stems 4 and 5, and a single cam *e'* on the outer side of the stem 5, the cams so acting on the tappets that each stamp is dropped twice and turned in both directions at every revolution of the cam-shaft, whereby the more regular distribution in the mortar-box of the ore or substance to be crushed is attained and the wear on the various bearing surfaces more evenly divided,
60 substantially as herein set forth.

CHARLES RALEIGH.

Witnesses:

F. J. RAPSON,

P. VARNALS.