(No Model.)

F. H. McDOWELL.

ORE CRUSHER.

No. 286,723. Patented Oct. 16, 1883.

Fig. 1.

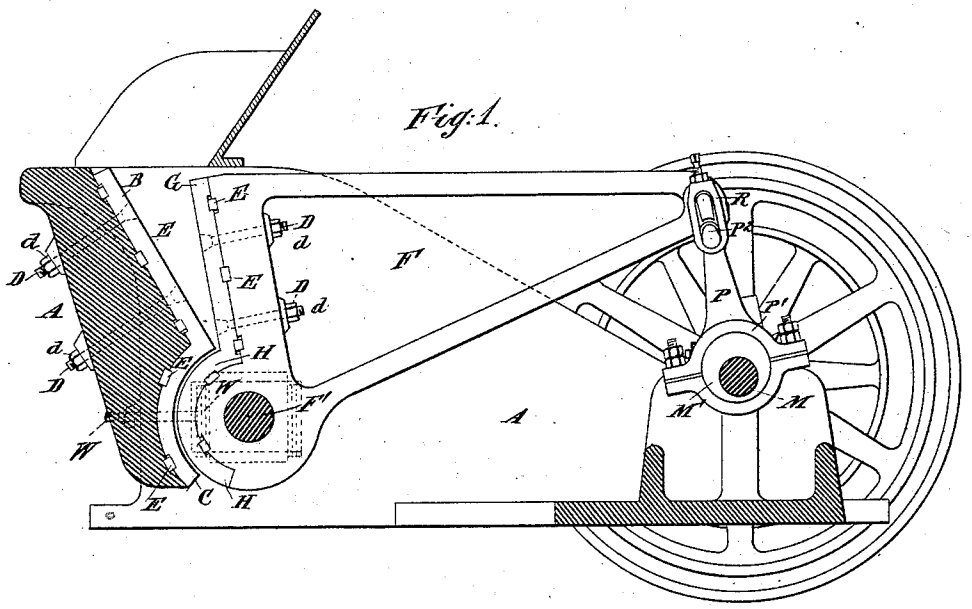
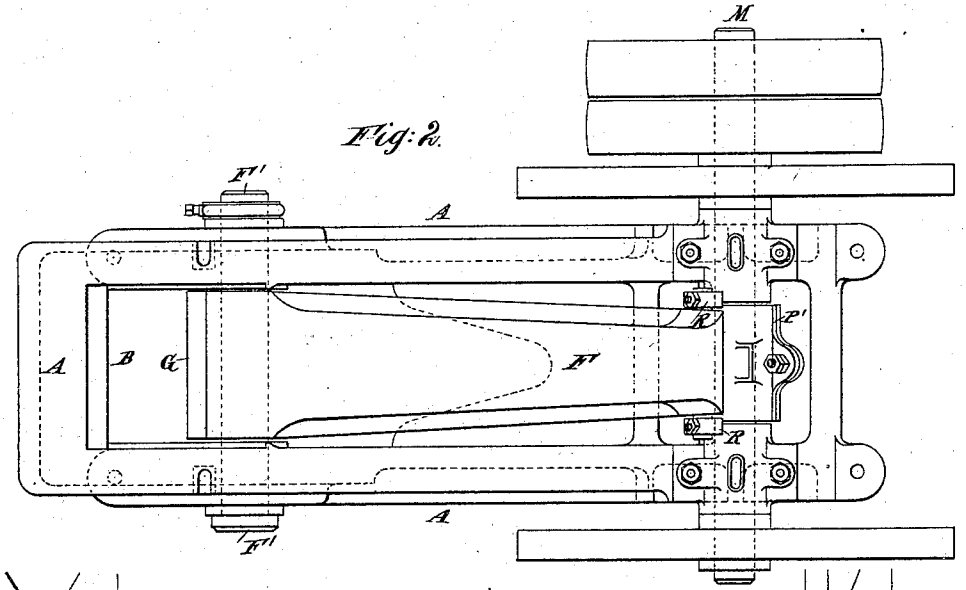


Fig. 2.



WITNESSES—

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UNITED STATES PATENT OFFICE.

FREDERICK H. McDOWELL, OF NEW YORK, N. Y.

ORE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 286,723, dated October 16, 1883.

Application filed January 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK H. McDOWELL, of New York city, in the county and State of New York, have invented certain new and useful Improvements in Ore-Crushers, of which the following is a specification.

I have devised a single simple machine which will receive lumps of ore of varying dimensions and treat them, first, by simple compression to break them small, and subsequently by a grinding action, and discharge the material finely comminuted. It may be adjusted to grind to different degrees of fineness.

The accompanying drawings represent a machine constructed according to my invention.

Figure 1 is a longitudinal vertical section. Fig. 2 is a plan view.

Referring to the drawings and to the letters of reference marked thereon, A is a stout framing, of cast-iron or other suitable material, and B C a steel or chilled-iron facing-piece, secured thereon by bolts D and nuts *d*, and also held firmly against displacement by cogs or keys E, fitting in transverse scores or grooves formed partly in the framing A and partly in the hard facing-piece B C.

F is a stout jaw, of cast-iron or other suitable material, rocking on a stout shaft, F′.

G H is a facing-piece of steel or iron, secured by bolts D and nuts *d*, and also held firmly against displacement by keys E, fitted in transverse scores or grooves formed partly in the jaw F and partly in the hard facing-piece G H.

M is a constantly-revolving shaft, carrying a broad eccentric, M′.

P is a stout connecting-rod or toggle having a suitably-formed end, P′, engaged on the eccentric M′, and a suitably-formed end, P^2, engaging in a bearing under the end of the jaw F. There are straps R, which fit over projections in the sides of the jaw F and in the sides of the connecting-rod P, which insure the sufficiently-prompt return of the jaw after each closing movement.

The lower curved portions of the hard facing-pieces B C are concentric, or nearly so, and as the jaw reciprocates work with a purely rubbing motion; but the upper portions of the hard facing-pieces B C G H are plane surfaces, the face G opening and closing in relation to the face B with a direct motion. The space between the upper portions is V-shaped, and adapted to receive large stones or lumps of ore, and by the vibrations of the jaw F to crack them into successively smaller pieces as they descend, and to allow them to descend farther until they reach the curved portions, in which they will be subjected to a grinding action. The plane surfaces of the upper parts and the curved surfaces of the lower portions are ridged transversely. I have provided for resisting the disturbing strains to which the hard facing-pieces are exposed in their junctions with the stationary framing and with the jaw, respectively. The action in the lower portions tends to shift the hard facing-pieces B and G successively upward and downward. This strain is resisted by the cogs or keys E. The bolts D and nuts *d*, in combination with the other parts, hold the whole very firmly. The curved rubbing-surfaces can be set nearer together or farther apart, and the jaw-surfaces above will be correspondingly set nearer together or farther apart; but a small adjustment of these upper parts will be less appreciable. The changes are made by shifting the position of the axis of motion of the jaw. The bearings of the jaw are held in boxes, each of which may be a single box, or composed of two or more pieces, with babbitting or other provisions for making durable bearing-surfaces and any ordinary or suitable provisions for excluding dust and supplying and retaining oil. Their positions are adjusted by shimming-pieces W, which are placed on the one side or the other until the right position is obtained. When these pieces are adjusted rightly, the whole is compressed firmly by a stout screw, W′, so that the box has a firm bearing either directly against the back of its recess or against one or more shimming-pieces behind it.

It will be observed that the grooves in the chilled-iron face-pieces B C and G H are a little nearer together than the corresponding grooves in the surfaces which support them. It follows from this fact that when the keys E are driven in, these scores or grooves, each matching partly in a groove in the chilled iron and partly in a groove in the ordinary cast-iron behind it, there is a locking action, due to the absence of coincidence of position, which aids to hold the chilled iron to the supporting-iron with far greater firmness than

could result from a mere joggling of the surfaces the one into the other, as has been heretofore practiced.

Modifications may be made in the details. The number of bolts and keys may be varied. The proportions of the upper or jaw parts of the surfaces to the lower or grinding parts may be varied. I can use other means for adjusting the position of the axis of the jaw, and consequently varying the fineness of the product and the rapidity with which the ore may be fed through; but I prefer the means shown.

I claim as my invention—

The fastening-bolts D, nuts *d*, and cogs or keys E, in combination with each other and with the framing A, vibrating jaw F, and facing-pieces B C G H, all arranged for joint operation, substantially as and for the purposes herein specified.

In testimony whereof I have hereunto set my hand, at New York city, New York, this 25th day of January, 1883, in the presence of two subscribing witnesses.

FREDERICK H. McDOWELL.

Witnesses:

WM. C. DEY,

CHARLES R. SEARLE.