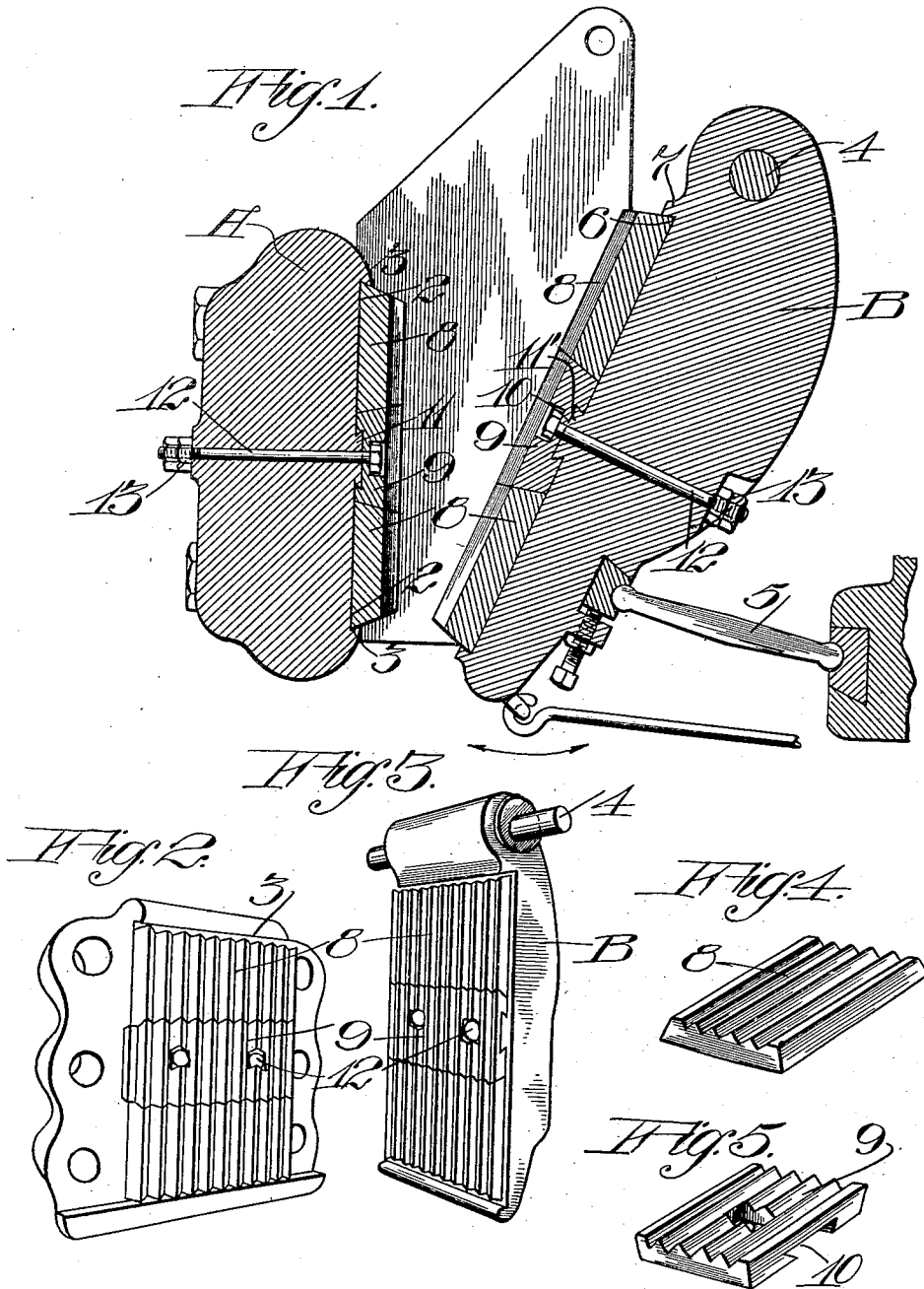


C. T. HUTCHINSON.
 ROCK CRUSHER.
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1,054,123.

Patented Feb. 25, 1913.



Witnesses:
 Chas. Kishler
 J. E. Maynard

Inventor:
 Charles T. Hutchinson
 by G. H. Strong
 Atty.

UNITED STATES PATENT OFFICE.

CHARLES T. HUTCHINSON, OF OAKLAND, CALIFORNIA, ASSIGNOR TO JOSHUA HENDRY
IRON WORKS, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

ROCK-CRUSHER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES T. HUTCHINSON, citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Rock-Crushers, of which the following is a specification.

This invention relates to a rock crusher of the oscillating jaw type and particularly pertains to the construction of the shoe and die therein.

It is the object of this invention to provide sectional shoes and dies for rock crushers of the jaw type, which are interchangeable and interlocking and which are designed to obviate one of the most serious objections heretofore found in jaw type crushers, viz: the waste of material caused by the cupping or unequal wearing of the crushing faces, and the necessity of replacing the worn portions by the installation of entirely new shoes and dies.

In the ordinary type of jaw crusher in which the shoe and the die each consist of a one-piece crushing plate, these plates become worn greatest in their middle, adjacent their ends, and not throughout the entire width. The shoe and die thus worn may be set up until they practically touch at the edges, and still be so badly worn or cupped that a piece of rock much too large for its purpose will be permitted to easily escape further crushing and thus destroy the usefulness of the breaker. When this condition is reached the worn shoes and dies are discarded, and as the average wear of shoes and dies is twenty-five per cent. of the total weight when new, the balance of seventy-five per cent. becomes a waste and is of no further value. Inasmuch as the shoes and dies are made of the hardest and most expensive steel the loss due to replacement and waste is very great.

I purpose forming the crushing faces of the shoes and dies in sections and of such character that they are interchangeable so that the defects arising from the use of single piece crushing faces are largely obviated and a very considerable economy of time and money effected. Practical tests and experiments have demonstrated that by constructing and arranging the shoe and die in accordance with this invention that at least eighty-five per cent. of the weight of the

shoe and die can be used before replacements or renewals become necessary.

The invention consists of the parts and the combination and construction of parts as hereinafter more fully described and claimed having reference to the accompanying drawings, in which—

Figure 1 is a vertical section of the invention. Fig. 2 is a perspective view of the die. Fig. 3 is a perspective view of the shoe. Fig. 4 is a perspective view of the interchangeable sectional crushing plate. Fig. 5 is a perspective view of the key locking crushing plate.

In the drawings A represents a stationary end plate the face of which is recessed, as at 2, which recess is bordered by an inwardly extending flange or lip 3. A swinging jaw is indicated at B, which jaw is mounted on and depends from a shaft 4 and is designed to be oscillated by and through a toggle 5 from any suitable source of power by means of any desired mechanism, the jaw B being designed to have a rocking movement with the shaft 4 as a pivot. The outer face of the jaw B is recessed as at 6, which recess is surrounded by an inwardly extending flange 7.

The essence of this invention resides in mounting a series of detachable and interchangeable corrugated, or plain plates in the recesses 2—6 on the end plate A and the swinging jaw B, respectively. These jaw plates are peculiarly constructed and arranged and embody plates of two slightly different constructions, one of which is indicated at 8 and the other at 9, and are respectively shown in detail in Figs. 4 and 5. The plates 8 and 9 are of equal thickness and are of corresponding width, and are so corrugated on their outer faces that when placed end to end the corrugations will extend continuously the combined lengths of the plates. The sides of the plates 8 and 9 are sloped or beveled in an outward direction, as are the ends of the plates 8, as shown in Fig. 4, while the ends of the plates 9 are beveled inwardly, as shown in Fig. 5. The underside of each plate 9 is grooved transversely with a dove-tailed groove 10 which is adapted to be engaged with a corresponding dove-tailed projection 11—11' formed on the recessed face of the end plate A and jaw B, as shown in Fig. 1.

In assembling the corrugated plates 8—9 on the end plate A and jaw B; a pair of the plates 8 are placed in the recesses 2—6 at each end thereof, with the tapered ends 5 of the plates extending beneath the overhanging flanges 3—7. A pair of the central key arch plates 9 are then placed in the space intervening between the inner ends of the plates 8, the plates 9 being inserted 10 in a lateral direction so as to be engaged by the dove-tail 11. When thus positioned the outer ends of the plates 9 will overhang the inner ends of the plates 8 and thus lock the latter in position on the plate A and 15 jaw B. As a means of further securing the plates 8 and 9 in position countersunk-head bolts 12 are passed through the plates 9 as shown in Fig. 1, and extending through the plate A and jaw B are secured by nuts 13, 20 the bolts 12 thus rigidly clamping the plates 8 and 9 against movement.

From the foregoing it will be seen that when the outer ends and central portions of the corrugated plates 8 become worn that 25 they may be reversed and turned up side down so as to place the unworn portions in the position of greatest wear. The several sections are so fitted and dove-tailed together that when the countersunk-head bolts 30 through the middle sections are tightened, the whole six sections are securely interlocked in place. The two upper, as well as the two lower sections of the plates 8 are interchangeable and being exactly alike, 35 they may be shifted, reversed and turned upside down repeatedly as they become worn until their usefulness is over. The middle or key arch sections 9 are interchangeable and may also be reversed as becomes neces- 40 sary, and worn almost entirely to the surface.

In actual practice I prefer to make the die sections substantially trapezoidal in form, with reversing end bevels to engage the central key arch section so that it will co- 45 act with the under-cut ends 3—7 of the jaw plates A—B in holding all the sections together when engaged either by the dovetails 11—11' or drawn up by the bolts 12.

Having thus described my invention, what I claim and desire to secure by Letters Pat- 50 ent is—

1. In a rock crusher, a crushing member having a flat face with under-cut ends, a die section of trapezoidal form having one of its beveled edges fitting one of said under- 55 cut ends, another trapezoidal die section having a beveled end fitting the opposite under-cut end and a trapezoidal key arch central die section interposed and interlocking with said upper and lower die sections, 60 and means co-acting with the central die section and with said under-cut ends to hold all the die sections rigidly in place.

2. In a rock crusher, a crusher member having a flat face with under-cut ends, die 65 sections of trapezoidal form having their edges beveled, a trapezoidal key arch central die section interposed between and interlocking with said first mentioned die sections, 70 and means co-acting with said central die section to hold said central die section in definite position, said first mentioned die sections being interchangeable and reversible.

In testimony whereof I have hereunto set my hand in the presence of two subscribing 75 witnesses.

CHARLES T. HUTCHINSON.

Witnesses:

CHARLES EDELMAN,
D. B. VALENTINE.