

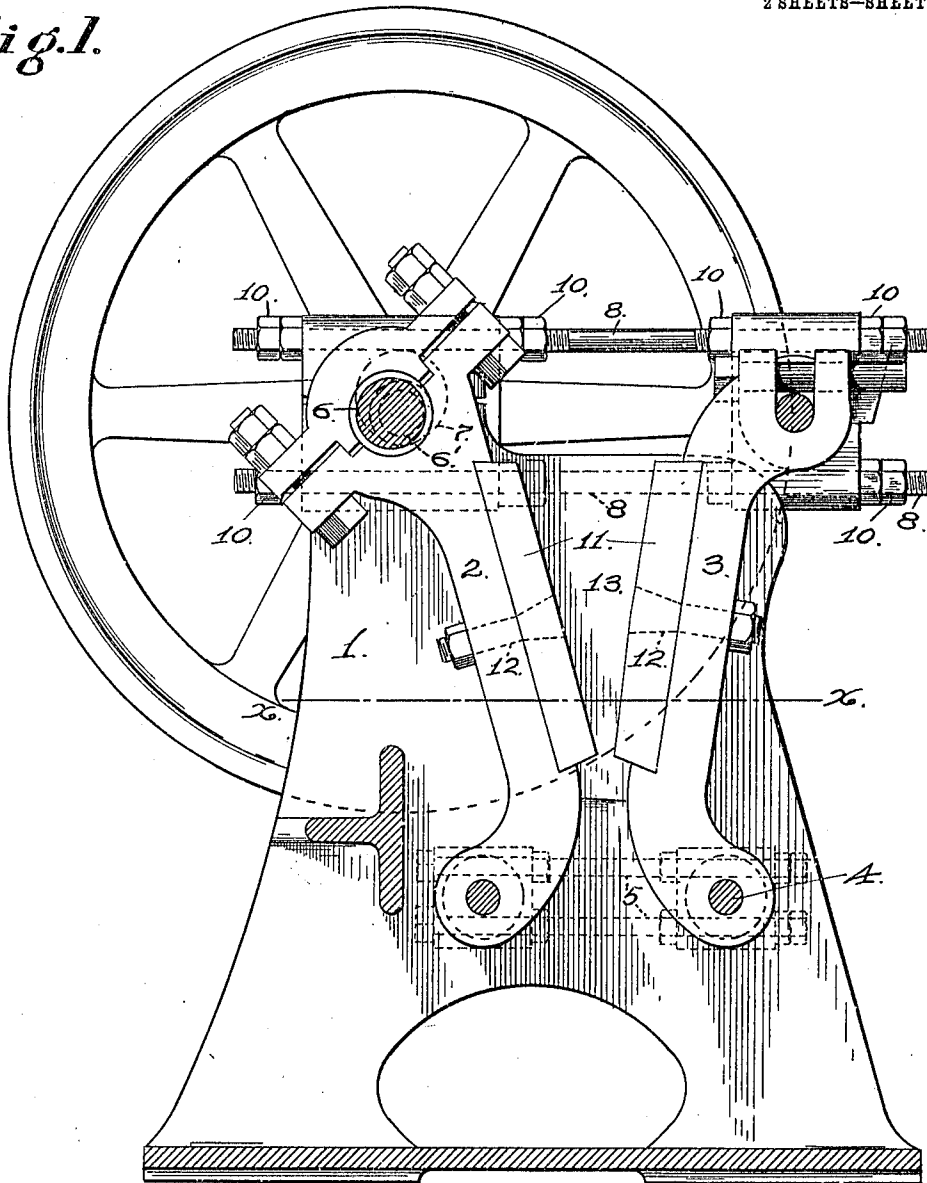
E. C. HUTCHINSON.
ORE CRUSHING MACHINERY.
APPLICATION FILED JUNE 4, 1908.

954,295.

Patented Apr. 5, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES.

Arthur L. Lee
W. H. Smyth.

INVENTOR.

E. C. Hutchinson
by Walter
Disney

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2 SHEETS—SHEET 2.

Fig. 2.

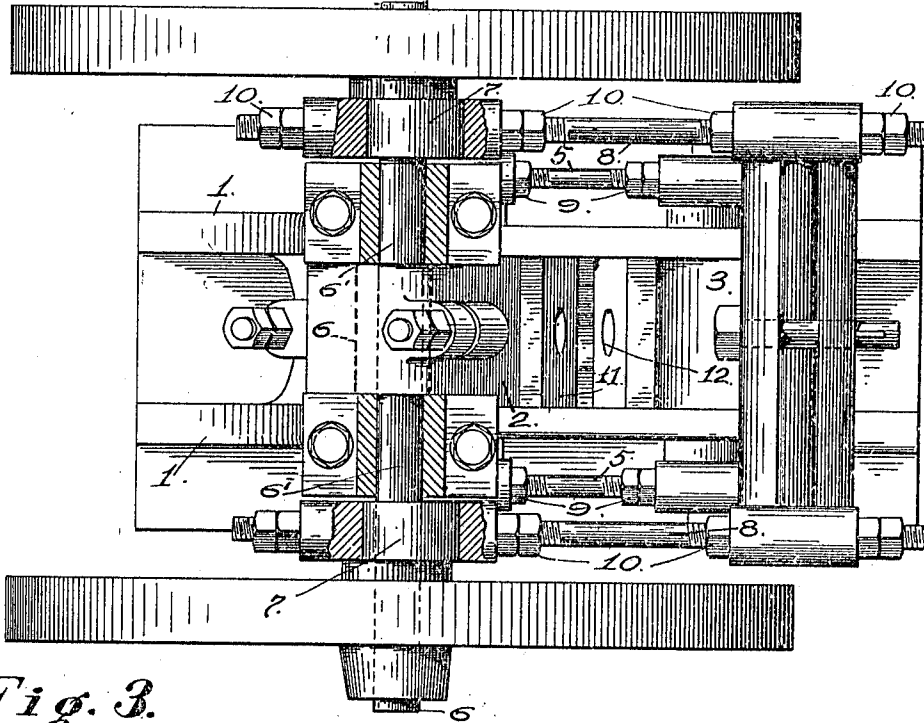
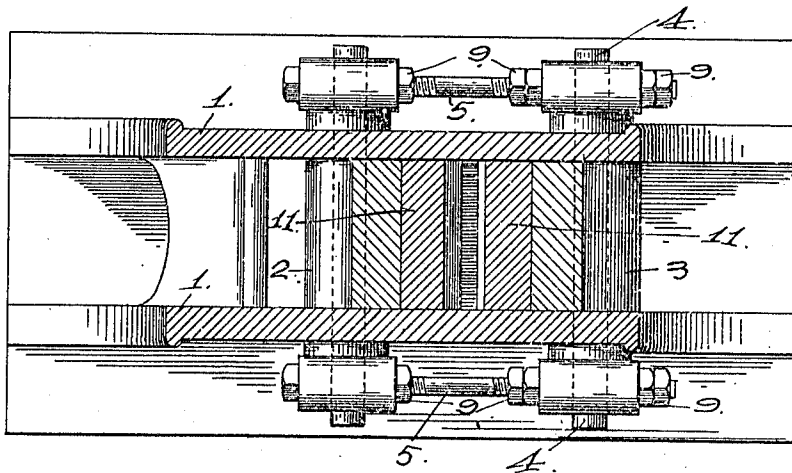


Fig. 3.



WITNESSES.

Arthur L. Lee
W. S. Smyth.

INVENTOR.

E. C. Hutchinson
By [Signature]
His atty.

UNITED STATES PATENT OFFICE.

ELY C. HUTCHINSON, OF OAKLAND, CALIFORNIA.

ORE-CRUSHING MACHINERY.

954,295.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed June 4, 1908. Serial No. 436,540.

To all whom it may concern:

Be it known that I, ELY C. HUTCHINSON, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Ore-Crushing Machinery, of which the following is a specification.

The hereinafter described invention relates to that class of crushing machinery known as ore crushers for the reducing of ores generally, and it resides more particularly in the manner of suspending and operating the crushing jaws relative to each other, the object to be attained being to provide for a compound action in connection with the crushing jaws, for which purpose one of the crushing jaws is so connected and operated as to have purely a horizontally reciprocating motion for the purpose of securing a crushing action for the ore to be reduced, while the opposing or companion jaw is so suspended and operated as to have imparted thereto a compound action, first stroke of its throw being a horizontally reciprocating movement to co-act with the corresponding stroke or throw of the horizontally reciprocating jaw for the crushing of the ore delivered between the jaws, the second movement or stroke of the said jaw being a vertically reciprocating one in order to produce a grinding action of the ore against the face of the opposing jaw for finely reducing the crushed ore prior to its discharge from between the crushing jaws.

To comprehend the invention reference should be had to the accompanying sheet of drawings, wherein—

Figure 1 is a side view of the improved ore crusher with the cheek plate thereof removed to illustrate the arrangement of the crushing jaws within the crusher. Fig. 2 is a top plan view of the improved ore crusher, partly broken away. Fig. 3 is a horizontal sectional plan view taken on line *x—x*—Fig. 1 of the drawings.

In the drawings, the numeral 1 is used to indicate any suitable form of a supporting frame, and 2—3 the crushing jaws suspended within the frame. The jaw 3, which constitutes the horizontally reciprocating jaw of the crusher, is loosely mounted at its lower end on the transverse rod 4, from which rod, at each side of the jaw 3, extends the links or link rods 5. These links or link rods 5 are pivoted to the lower end of

the opposing crushing jaw 2, which jaw, at its upper end, is suspended from an eccentric 6 secured on the drive shaft 6', which shaft also has secured thereon, outside the sphere of the crushing jaw 2, the eccentrics 7. To these eccentrics 7 are connected the links or link rods 8, which links or link rods are also pivotally connected to the upper end portion of the crushing jaw 3. The movement of the links or link rods 8 by the action of the eccentrics 7, driven from the drive shaft 6', is transmitted to the crushing jaw 3, to cause the same to swing or reciprocate horizontally on its pivotal point, which, in the present case, is the transverse rod 4. Thus only one action of movement is imparted to the crushing jaw 3, viz. a horizontal reciprocating movement. However, the companion crushing jaw 2 has a compound action, to wit, a horizontally reciprocating movement and a vertically reciprocating one, which is produced by reason of the fact that at its lower end the said crushing jaw is connected to the pivotal point of the crushing jaw 3 by the links or link rods 5, while at its upper end it is suspended from an actuating eccentric 6 secured to the drive shaft 6', the rotary movement of the said eccentric 6 imparting to the crushing jaw 2 the mentioned compound action, the function of which is to secure first, a crushing of the ore delivered between the jaws 2—3 as the same are forced toward each other, and secondly, a grinding of the crushed ore as the crushing jaw 2 makes the vertical throw of its stroke, the path of the movement of the said jaw 2 being that of an eccentric. The ore delivered between the crushing jaws 2—3 of the apparatus is thus not only broken or crushed, but the same is reduced by the secondary or grinding action of the jaw 2 to the required condition of fineness.

The links or link rods 5 may be shortened or lengthened by means of the adjusting nuts 9, and the links or link rods 8 likewise adjusted by means of the nuts 10, so that the distance between the crushing jaws 2—3 may be varied to meet the condition of the ore to be treated. Each crushing jaw is provided with a removable wear shoe or die 11, which when one face thereof has become worn may be removed by releasing the bolts 12 and the position thereof reversed, or the same may be replaced by a new shoe or die. The inner lining or cheek plates 13 of the

ore crusher are detachably secured to the inner face of the supporting frame by means of bolts.

Any suitable form of drive mechanism 5 may be employed for imparting rotation to the drive shaft 6', carrying the actuating eccentrics 6 and 7, for actuating the connecting means for imparting the desired movement to the respective co-acting crushing 10 jaws.

Having thus described the invention, what is claimed as new and desired to be protected by Letters Patent is—

1. An apparatus for the crushing of ores, 15 the same comprising a suitable supporting frame, two opposing jaws therein, one of which is a crushing jaw and the other a crushing and grinding jaw, a relatively fixed pivot member at the lower end of the 20 crushing jaw, a movable pivot member at the lower end of the grinding and crushing jaw, having a link connection with the fixed pivot member, a bearing at the upper end of the grinding and crushing jaw for an eccentric, a shaft carrying said eccentric, and 25 having an auxiliary eccentric member, a rod fitted within a bifurcated portion of the crushing jaw, an overlying retaining bolt for said rod, a linked connection between the 30 auxiliary eccentric member and said rod, and crushing members on the jaws intermediate their ends.

2. An apparatus for the crushing of ores, the same comprising a suitable supporting

frame, two opposing jaws therein, one of 35 which is a crushing jaw and the other a crushing and grinding jaw, the crushing jaw having an aperture extending there- through at its lower end and terminating 40 in a bifurcated portion at its upper end and the grinding and crushing jaw having at its lower end an aperture extending there- through and having at its upper end a bi- furcated recess, a relatively fixed pivot 45 member extending through the aperture of the crushing jaw, a movable pivot member extending through the aperture of the grinding and crushing jaw and having a link connection with the fixed pivot member, 50 an overhanging cap fitted to the upper end of the grinding and crushing jaw and constituting with the bifurcated end thereof a bearing for an eccentric, a shaft carrying said eccentric, and having an auxiliary ec- 55 centric member, a rod fitted within the bi- furcated end of the crushing jaw, an over- lying retaining bolt for said rod, and a linked connection between the auxiliary ec- centric member and said rod, and crushing 60 members on the jaws intermediate their ends.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ELY C. HUTCHINSON.

Witnesses:

N. A. ACKER,

D. B. RICHARDS.