

(No Model.)

2 Sheets—Sheet 1.

J. BRUMBAUGH.
ORE CRUSHER.

No. 469,120.

Patented Feb. 16, 1892.

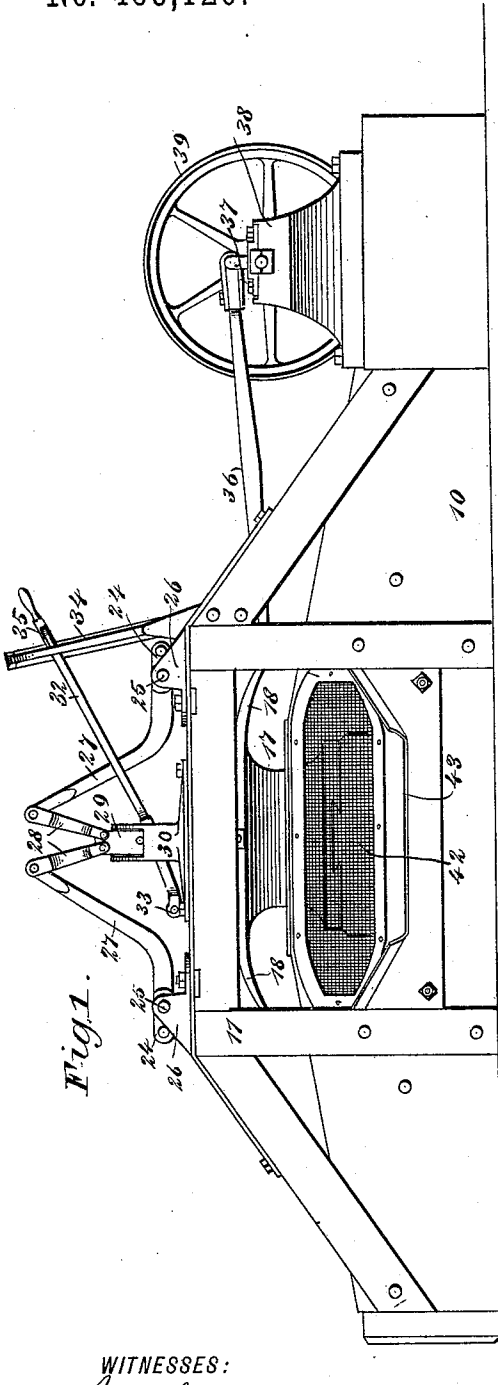


Fig. 1.

WITNESSES:

Paul J. J. J.
C. Sedgwick

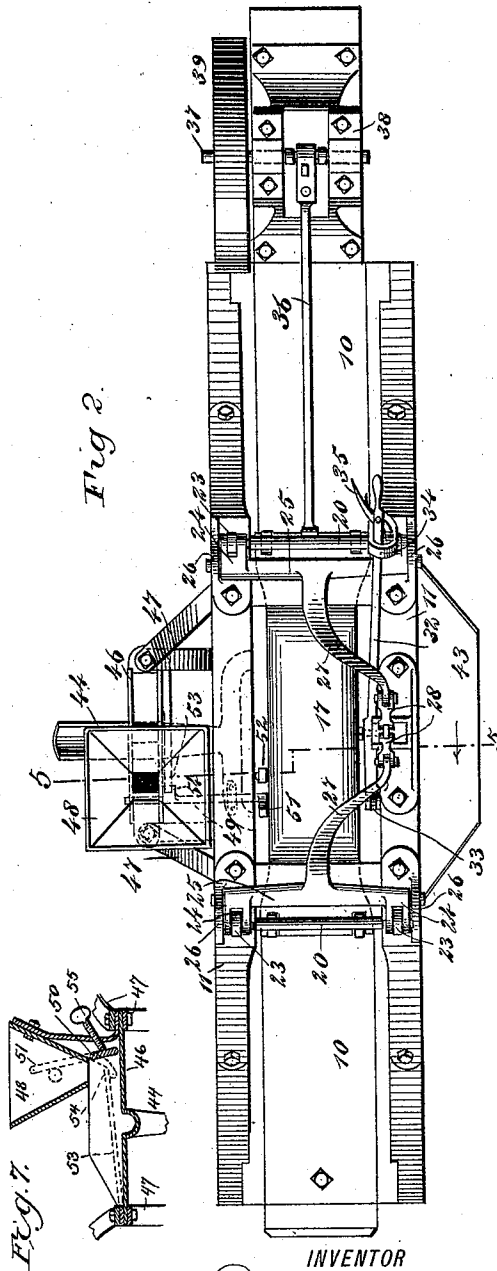


Fig. 2.

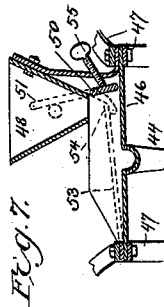


Fig. 3.

INVENTOR

J. Brumbaugh
BY Munn & Co.

ATTORNEYS.

(No Model.)

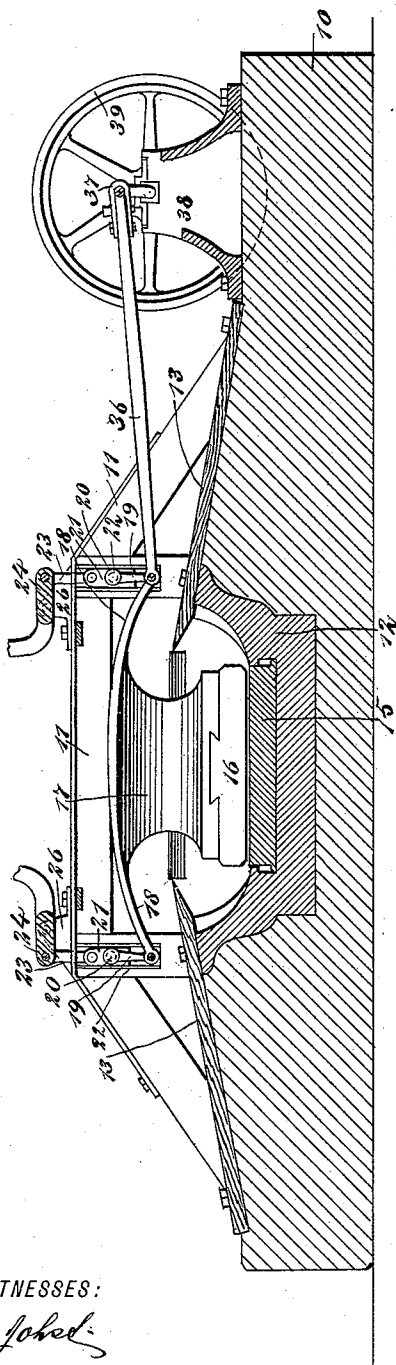
2 Sheets—Sheet 2.

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Fig 3.



WITNESSES:
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W. Sedgwick

Fig 5.

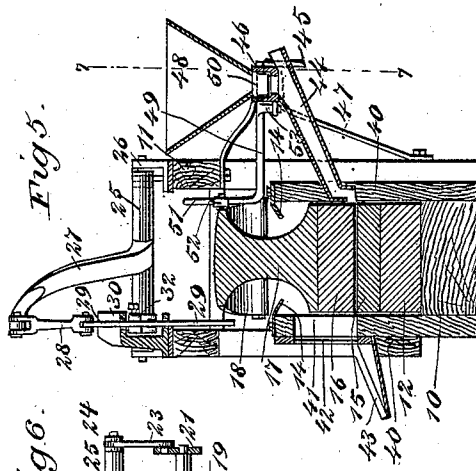


Fig 6.

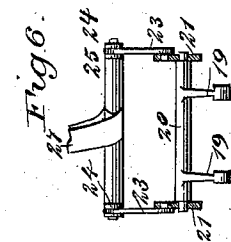
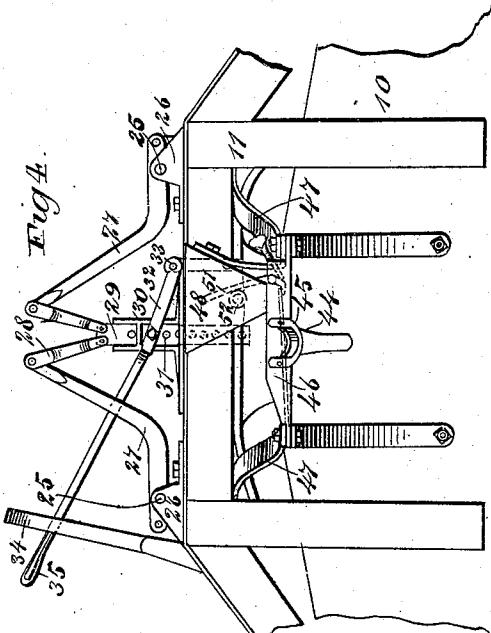


Fig 4.



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UNITED STATES PATENT OFFICE.

JOSEPH BRUMBAUGH, OF GOLD HILL, OREGON.

ORE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 469,120, dated February 16, 1892.

Application filed August 8, 1891. Serial No. 402,138. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BRUMBAUGH, of Gold Hill, in the county of Jackson and State of Oregon, have invented a new and Improved Ore-Crusher, of which the following is a full, clear, and exact description.

My invention relates to improvements in ore-crushers; and the object of my invention is to produce an efficient machine which will operate as a stamp and pulverizing machine and which may be nicely adjusted, so as to grind the ore to any desired degree of fineness.

To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a front elevation of the machine. Fig. 2 is a plan view of the same. Fig. 3 is a broken vertical longitudinal section. Fig. 4 is a broken side elevation taken from the rear. Fig. 5 is a vertical cross-section through the body and feed mechanism, taken on the line 5 5 in Fig. 2. Fig. 6 is a broken detail sectional view of the crank-supports for the upper die-block, and Fig. 7 is an enlarged detail sectional view of the feed mechanism on the line 7 7 of Fig. 5.

The machine is provided with a substantial base 10, which supports the frame-work 11, carrying the superstructure of the machine, and embedded centrally in the base is a concave bed-plate 12, and the cavity in the base carrying the bed-plate is partially covered by the projecting plates 13 and 14, so as to prevent the possibility of any of the ground ore slushing up out of the bed. In the center of the bed-plate is the under die 15 of the machine, which is capable of vertical adjustment, and this adjustment may be effected by placing metallic plates beneath the die. The upper die 16, which fits upon the lower die, is dovetailed into the block 17, which stamp projects above the bed and is provided at each end with projecting arms 18, which arms are pivoted to the lower ends of cranks 19, said cranks being secured to the shafts 20, which

extend transversely across the machine above the rear end of the bed-plate; and the ends of the shafts 20 are journaled in vertically-sliding blocks 21, which are held to move in the slideways 22 in the frame 11. The sliding blocks are connected by links 23 with cranks 24 on transverse shafts 25, which are arranged above the shafts 20 and turn in boxes 26, carried on the top of the frame 11.

The shafts 25 are provided with upwardly extending and converging levers 27, which are curved forward and which at their upper ends are pivoted to short levers 28, thus forming toggle-joints, and the levers 28 are at their lower ends pivoted to a sliding plate 29, which is held to move vertically in the slide-way 30, which is located on the frame 11, above the central portion of the machine and on the front side, and the plate 29 is provided with a series of holes 31, which enable it to be secured at any necessary point to the lever 32, which is arranged longitudinally upon the top of the machine-frame, being pivoted at one end, as shown at 33, and the lever extends through a toothed rack 34, supported on the frame 11, and is held in a desired position in the rack by means of the spring-latch 35, which engages the teeth of the rack. It will thus be seen that by moving the lever 32 the slide-plate 29 may be moved and the levers 27 operated to turn the shafts 25 and thus raise the slide-blocks 21 and the shafts 20 and block 17, carried by the blocks, so that by properly adjusting the said lever 32 the upper die 16, carried by the block 17, may be held the exact distance desired from the lower die 15. This mechanism enables the ore to be ground to any desired degree of fineness.

One end of the block 17—that is, one of the arms 18—is pivoted to a pitman 36, by which it connects with a crank-shaft 37, mounted in suitable bearings on the pedestal 38, which is arranged on one end of the base 10, and the crank-shaft is turned by a fly-wheel 39, by which power may be applied. When the wheel is turned, the crank-shaft will be revolved and the movement of the crank-shaft will be imparted to the block 17, thus moving it back and forth in the cavity of the bed-plate 12, and as the stamp will swing on the shafts 20 the upper die will have a rubbing effect as it

passes the lower die, and it will be seen that it will give two grinding strokes at every revolution of the fly-wheel.

The dies are walled in by the side plates 40, the front one of which is provided with a central opening 41, the lower portion of the opening being about flush with the upper surface of the lower die, and this opening is closed by a screen 42, beneath and in front of which is a spout 43, and when the machine is operated the movement of the block 17 will cause the pulp to slush up against the screen, and the finer portions of the pulp will pass through and be delivered upon the spout 43; but in crushing free-milling ore the greater portion of the metal will remain in the crusher.

On the back of the machine is a spout 44, which delivers at two points in the crusher, as indicated by dotted lines in Fig. 2, thus causing an even distribution of the ore, and the upper end of the spout is supported in a hanger 45, which is secured to the feed-trough 46, said trough extending in a nearly horizontal position at one side of the machine and being supported in suitable braces 47. This feed-trough is provided with a hopper 48, which delivers into the trough, and mounted transversely on the machine-frame and on the rear end of the trough is a shaft 49, which carries a shovel 50 at one end, as best shown in Fig. 5, said shovel being arranged opposite the lower end of the hopper, and the oscillations of the shovel will serve to push the ore from underneath the hopper through the feed-trough and into the inclined spout 44.

The inner end of the shaft 49 terminates in an upwardly-extending crank 51, which projects into the path of a roller 52, which is mounted on the upper edge of the block 17, and it will be seen that every stroke of the block 17 will cause the roller to strike the crank 51 and thus tilt the shaft 49 and oscillate the shovel 50, and to return the shovel to its normal position after it has been operated by the swinging stamp a flat spring 53 is employed, which is secured at one end to the side of the feed-trough and at its free end presses upon an arm 54 on the shaft 49, as best shown by dotted lines in Fig. 2. The backward movement of the shovel is limited by a thumb-screw 55, which is mounted in a suitable support and extends into the path of

the shovel. Instead of using the spring, however, a yoke connection may be made between the crank 51 and the block, or other suitable means may be employed to tilt the shaft 49 by the movement of the block.

The operation of the machine is as follows: The crushed ore is fed into the hopper 48, sufficient water is run through the spout 44 to wash down and flush the ore, and the ore is fed through the trough 46 and spout 44 in the manner described and is delivered into the battery, where, owing to the concave shape of the bed-plate 12, it will find its way upon the lower die 15. The movement of the fly-wheel 39 and crank 37 will oscillate the block 17 in the manner described, thus causing the ore to be finely ground between the upper and lower dies, and from the foregoing description it will be readily understood that the machine may be adjusted so as to grind the ore as fine as is necessary.

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

1. An ore-crusher comprising a concave bed, a die secured therein, a block carrying a die to impinge upon the lower die, said block being supported by a crank-shaft at each end, and mechanism for reciprocating the block, substantially as described.

2. An ore-crusher comprising a concave bed carrying a die, a block held to move above the bed and provided with a die to impinge upon the lower die, crank-shafts mounted in vertically-movable bearings at each end of the block and arranged to support the latter, and a lever mechanism for adjusting the sliding bearings, substantially as described.

3. The combination, with a swinging block and the crank-shafts supporting the block, said shafts having their ends mounted in sliding blocks, of the crank-shafts connected with the sliding blocks, toggle-levers for moving the crank-shafts, said toggle-levers having their inner ends secured to a sliding plate, and a lever for adjusting the sliding plate, substantially as described.

JOSEPH BRUMBAUGH.

Witnesses:

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CHAS. GRIFFITHS.