

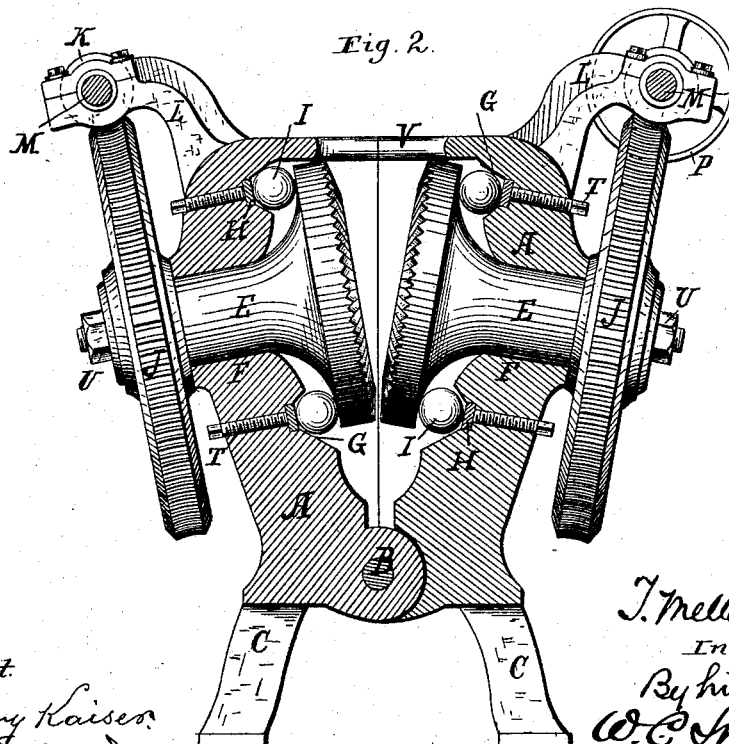
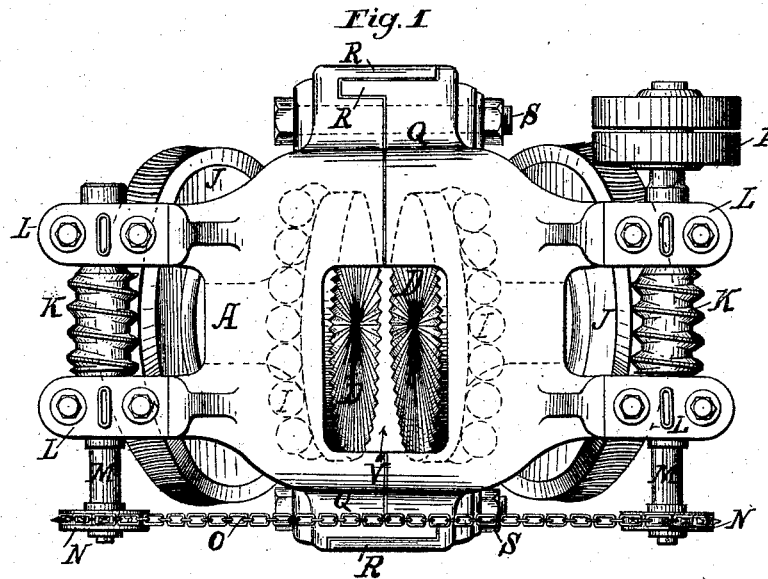
(No Model.)

2 Sheets—Sheet 1.

T. M. ROGERS.
STONE AND ORE CRUSHER.

No. 263,226.

Patented Aug. 22, 1882.



Attest:
J. Henry Kaiser
John Solley

J. Mellon Rogers,
Inventor.
By his Attorneys,
W. C. Strawbridge,
Boswell Taylor.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

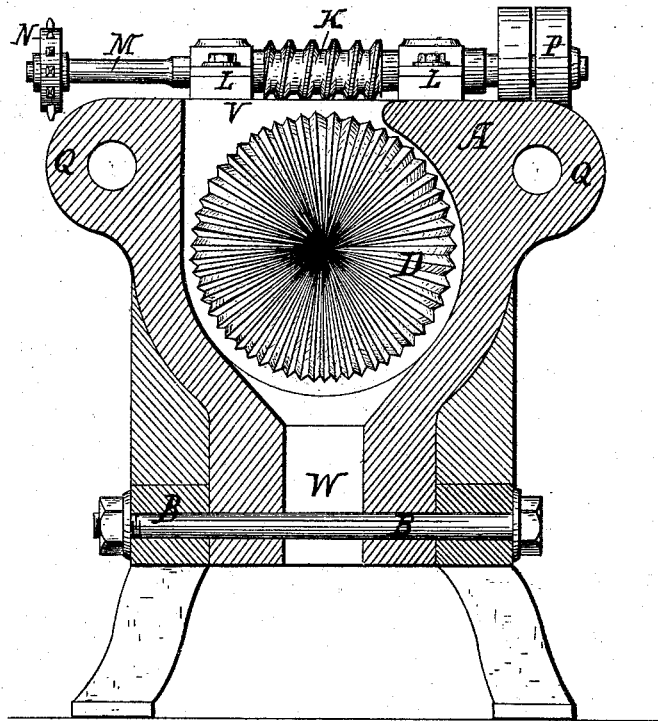


Fig. 4.

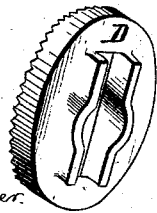
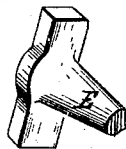


Fig. 5.



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UNITED STATES PATENT OFFICE.

T. MELLON ROGERS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO STEPHEN P. M. TASKER, OF SAME PLACE.

STONE AND ORE CRUSHER.

SPECIFICATION forming part of Letters Patent No. 263,226, dated August 22, 1882.

Application filed May 4, 1882. (No model.)

To all whom it may concern:

Be it known that I, T. MELLON ROGERS, of the city and county of Philadelphia, in the State of Pennsylvania, have invented an Improvement in Stone and Ore Crushers, of which the following is a specification.

My invention relates in general to machines employed for crushing or disintegrating metalliferous ores, stones, and other hard substances, and which machines are known as "stone-breakers" or "ore-crushers."

My invention consists substantially as hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a top plan view of a crusher or grinding-mill conveniently embodying my improvements. Fig. 2 is a longitudinal central sectional elevation of the same, the jaws, shafts, and worm-wheels being in side and not sectional elevation. Fig. 3 is a transverse vertical sectional elevation taken on a vertical plane projected between the revolving jaws. Fig. 4 is a perspective detail of a modified construction of jaw in which a clutch-seat is formed on the rear face to receive a clutch connected to a driving-axle. Fig. 5 is a similar view of a clutch adapted to actuate the disk of Fig. 4, and supposed mounted upon the forward extremity of a suitable driving-axle.

Similar letters of reference indicate corresponding parts.

The following is a description of a preferred construction of a crusher embodying my improvements.

A represents the housing or frame-work of the device, the same being composed, in the form of construction illustrated in the drawings, of two parts or castings hinged together at B, and for convenience supported upon legs or standards C. The exterior conformation of these castings may be such as convenience of manufacture may dictate; but internally as to their facing sides they are shaped out to fit them to receive the revolving jaws D, which are mounted upon shafts E, journaled in bearings F, suitably formed in the castings, and centered or disposed in such a manner that the shafts which pass through them are at angles, so as to cause the revolving jaws to assume such an angular position as will cause

said jaws to be wider apart as to the upper portions of their faces than as to the lower.

Channeled in the castings concentrically with respect to the bearings of the shafts are annular seats G, which are adapted, if desired, to be lined or fitted with annular tracks H, of chilled iron or steel, as clearly illustrated in Fig. 2. The seats are disposed immediately to the rear of the peripheries of the revolving jaws in such manner that when a series of suitably-sized spheres, balls, or rollers, I, are placed upon or within them the balls come in contact with the rear faces of the revolving jaws in proximity to their peripheries. When the jaws therefore are in place, as will be observed, they are not only supported by their shafts within the bearings, but rest and revolve upon the balls, which in turn rest and revolve upon the tracks. The shafts are extended rearwardly to the exterior of the castings, and are provided in the construction shown in the drawings with worm-wheels J, which mesh with worms K, suitably supported from brackets L, erected from the castings, through which brackets, two of which are preferably applied to each housing, a worm-shaft, M, is journaled. Sprocket-wheels N are applied to corresponding extremities of these worm-shafts, and a sprocket-chain, O, is applied to the wheels in such manner as to effect a positive connection between the two worms, whereby, when motion is applied through the pulley P upon one of the worm-shafts to said shaft, a corresponding positive movement is transmitted to the other. The two housings are projected or extended sidewise or otherwise suitably shaped to form or embody lateral projections Q, which are formed into or provided with overlapping webs R, as represented in Fig. 1. The office of this construction is to permit the two housings to separate to a certain extent about their hinge in order to increase or diminish the angle between the crushing-jaws and increase or diminish the discharge-opening between them, and adapt the apparatus for the crushing of ores of different degrees of fineness. The webs simply prevent such lateral escape of material from out the crushing-chamber formed between the two castings or parts of the housings as would

take place without said webs or without the provision of some equivalent inclosing device.

S are adjusting-bolts to control the set of the castings or sections of the housing.

- 5 T are set-screws threaded through the housing, and bearing, as to their inner extremities, upon the annular ball-tracks, the office of which screws is to adjust the height to which the tracks may be raised from their seats when it
10 is desired, without the adjustment of the housings themselves, to alter the set of the jaws with respect to each other in order to approach them more nearly together or to separate them and thereby regulate the size of the escape-
15 opening between them.

Adjusting-nuts U and washers or collars or kindred setting devices may be applied to the shafts and worm-wheels in order to effect the adjustment of the jaws.

- 20 The castings are so formed as to provide a feed opening or hopper, V, as to the upper parts of the machine, through which the material to be granulated is fed, and to form a discharging-chute, W, in the lower portion of the housings.
25

- In Figs. 4 and 5 is represented a convenient construction of detachable jaw and clutch-lug for the revolution of the same in cases where it is desirable to form the jaws separate from
30 their shafts. The jaws, as is clearly represented in the drawings, are provided upon their operative faces with radial serrations or teeth, so as to constitute each jaw in effect a jaw-plate adapted for the crushing operation. When
35 desirable, these serrated surfaces may be separately formed and applied to the disks which are adapted to receive them.

- Such being a description of a convenient form of apparatus embodying my invention,
40 its operation will be easily understood. Material to be pulverized is fed through the opening or hopper at the top of the housing, and descends between the jaws, which are revolved together in the same direction, and is by their
45 roughened faces carried around and crushed and discharged from between them. The balls ease the play of the jaws, take the strain off their journals, not only sustain that peripheral

portion of the jaws which is in effect the working-surface, but prevent the tendency of the
50 jaws to twist with respect to their shafts, counteract the endwise thrust of the jaws, and overcome the leverage which would otherwise be exerted upon the shafts through the fact that the greater part of the crushing operation is
55 carried on by that peripheral portion of the jaws which lies below their horizontal diameters.

The device is compact, simple and cheap of construction, and adapted for the crushing of substances of different sizes. Its action is continuous and positive, and it enables me to dispense with link and toggle constructions and to form the device of a very few parts.

While I have represented and described worm-wheel gearing as imparting the requisite
65 motion to the crushing-jaws, it yet will be understood that other gearing devices may be substituted for such gearing without departing from the essential features of construction of my device.
70

Having thus described my invention, I claim—

1. In a grinding-mill, the combination of two crushing wheels or jaws revolving in the same direction and placed at angles with respect to
75 each other, a housing, and two series of anti-friction balls disposed in suitable relation in the housing and to the rear of the jaws, and adapted to sustain the jaws against torsion or endwise thrust and to ease them on revolution.
80

2. In a stone or ore crushing mill, in combination, a housing, two crushing wheels or jaws revolving in the same direction and placed at angles with respect to each other, two series of anti-friction balls disposed in suitable relation in the housing and to the rear of the jaws,
85 two annular ball-tracks upon which said series of balls roll, and means for adjusting the set of the ball-tracks, as and for the purpose specified.

In testimony whereof I have hereunto signed
90 my name this 27th day of April, A. D. 1882.

T. MELLON ROGERS.

In presence of—

J. BONSALE TAYLOR,
W. C. STRAWBRIDGE.