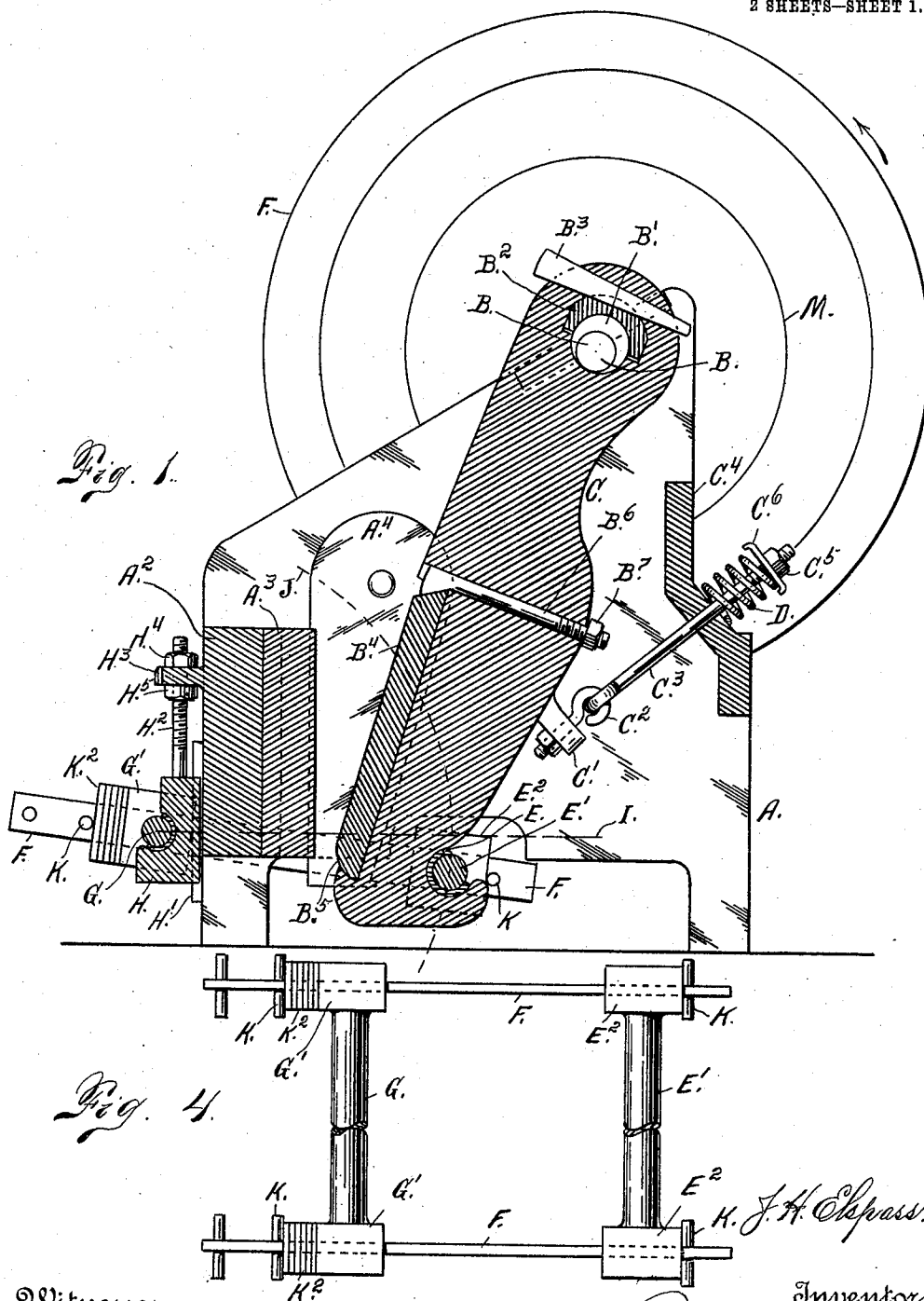


J. H. ELSPASS.
ROCK CRUSHER.
APPLICATION FILED JUNE 13, 1904.

2 SHEETS—SHEET 1.



Witnesses
Otto E. Hoddick
Dennis Nelson

Inventor
H. J. H. Elspass
 By *AGS*
 Attorney

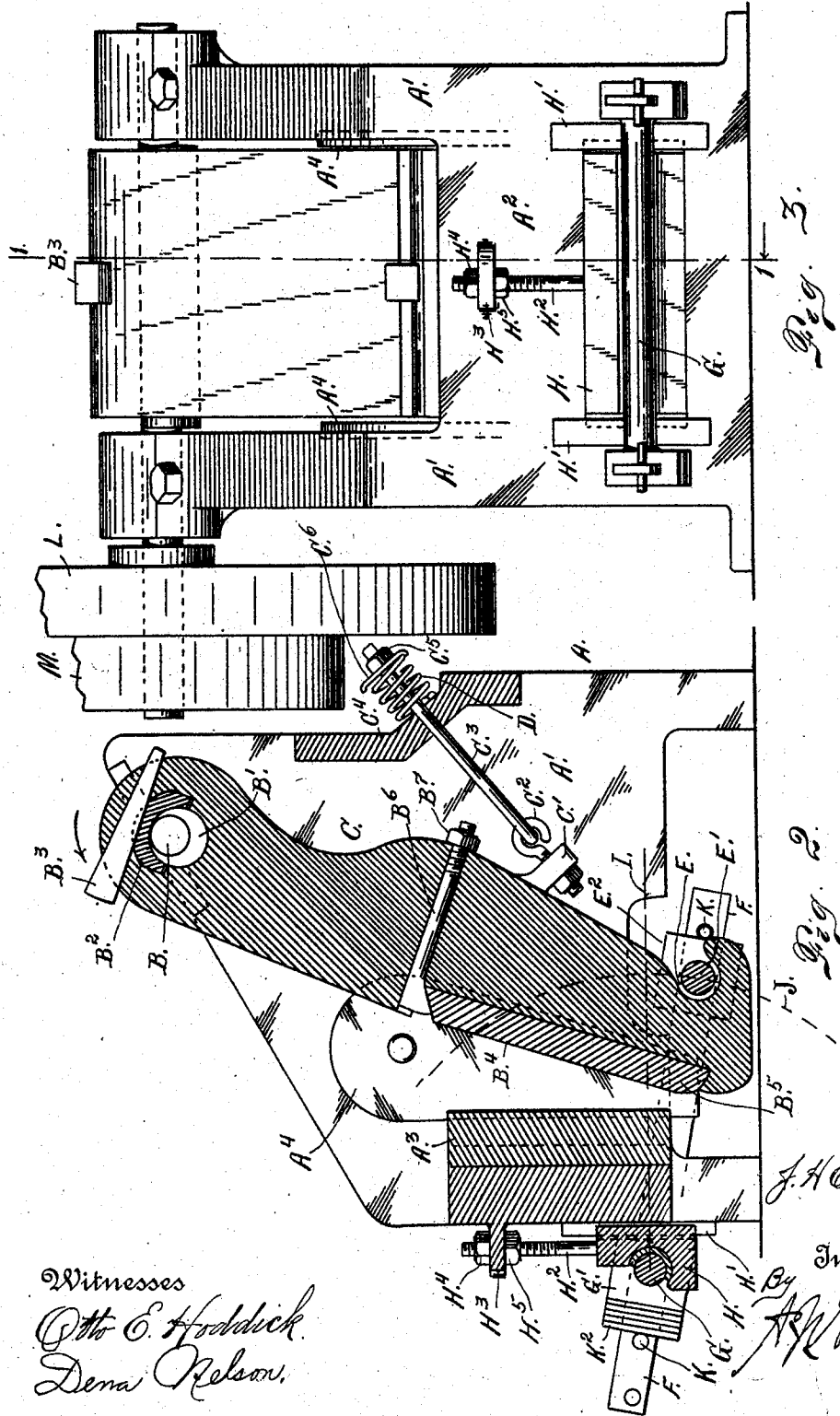
No. 800,278.

PATENTED SEPT. 26, 1905.

J. H. ELSPASS.
ROCK CRUSHER.

APPLICATION FILED JUNE 13, 1904.

2 SHEETS—SHEET 2.



Witnesses

Otto C. Huddick.
Dena Nelson.

Inventor

Attorney

UNITED STATES PATENT OFFICE.

JOHN H. ELSPASS, OF DENVER, COLORADO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE SAMSON MANUFACTURING COMPANY, A CORPORATION OF COLORADO.

ROCK-CRUSHER.

No. 800,278.

Specification of Letters Patent.

Patented Sept. 26, 1905.

Application filed June 13, 1904. Serial No. 212,250.

To all whom it may concern:

Be it known that I, JOHN H. ELSPASS, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Rock-Crushers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in rock-crushers, my object being to provide an apparatus of this class which shall be efficient, reliable, and durable in operation as well as economical in cost.

In my improved crusher the movable jaw is hung from the top on an eccentric formed on the driving or operating shaft, while the lower extremity of the jaw has a link connection with the forward extremity of the frame. This link connection consists of two shafts or journals which engage bearings formed in the lower part of the movable jaw and a block, respectively. This block is vertically movable on the front of the frame, whereby the center of motion for the lower extremity of the movable jaw may be regulated at will. By throwing the journal which engages the lower extremity of the movable jaw more or less below a horizontal line passed through the outer journal the lateral travel of the crushing-face of the jaw or its back-and-forth movement at its lower end during the performance of the crushing action may be regulated at will. The movable jaw is further supported by a rod which extends rearwardly and upwardly from the back of the jaw and is provided with a spring whereby the jaw is spring-supported, the spring having a tendency to lift the jaw, and thereby aiding the eccentric in the performance of the backward and upward movement.

By virtue of my improved construction the crushing-face of the movable jaw is moved rearwardly and upwardly during the upward movement of the eccentric and forwardly and downwardly during the downward movement of the eccentric, or during the downward travel of the point of greatest eccentricity of the eccentric-bearing. It will thus be seen

that during the rearward and upward movement of the jaw the crushing material has a downward tendency, since the space within which it is confined is enlarged. It will also be observed that during the downward and forward movement of the jaw there is both a grinding and a crushing action, the tendency of this movement of the jaw being also to drive the material downwardly.

By locating the center of the journal which engages the lower extremity of the movable jaw below the horizontal line passed through the center of the outer journal of the link or tie-rod connection as the movable jaw moves upwardly it opens or moves away or rearwardly from the stationary jaw, while during the downward movement the movable jaw also moves forwardly or has the closing action.

It will be observed that the special construction and arrangement whereby the journal of the lower extremity of the movable jaw may be located at any desired distance below the horizontal line above mentioned is important, since the jaw's travel may be regulated by virtue of this adjustment.

Having briefly outlined my improved construction, as well as the function it is intended to perform, I will proceed to describe the same in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a sectional view of my improved crusher, taken on the line 1-1, Fig. 3, showing the movable jaw at its upward limit of movement. Fig. 2 is a similar view showing the movable jaw at its downward limit of movement, the driving-pulley and fly-wheel being omitted. Fig. 3 is a front view of the construction shown in Fig. 1, the fly-wheel and pulley being partly broken away. Fig. 4 is a detail view of the link connection or tie-rod connection between the lower extremity of the movable jaw and the forward end of the frame.

The same reference characters indicate the same parts in all the views.

Let A designate the framework of the apparatus. Between the sides A' of this framework is located the integral front part A², against which bears the front wearing-plate or stationary jaw A³, which is held between the two side wearing-plates A⁴. Journalled in

the sides of the frame is a shaft B, provided with an eccentric B', which engages an opening formed in the upper extremity of the movable jaw C. The jaw is provided with a bushing B², located above the shaft and held in place by a key B³. The face-plate B⁴ of the movable jaw engages a shoulder B⁵ at its lower extremity, while its upper extremity is beveled and engaged by the head of the bolt B⁶, whose outer extremity is threaded to receive a nut B⁷. The shape of the bolt-head is such as to lock the face-plate B⁴ in position when the nut is screwed tightly against the rear side of the jaw. The rear side of the jaw C is provided with a lug C', to which is attached a screw-eye C², which is engaged by a bolt C³, which passes through a connecting-plate C⁴, forming a part of the frame. The outer extremity of this bolt is provided with a nut C⁵, and below the nut is a cap C⁶. Between this cap and the rear part of the frame is located a coil-spring D, which surrounds the bolt and is normally under tension, having a tendency to lift the movable jaw.

The rear side of the lower extremity of the movable jaw is recessed, as shown at E, to receive a journal E', whose outer extremities are enlarged, as shown at E², and slotted to receive tie-rods F, which pass on opposite sides of the movable jaw and protrude from the front part of the frame. A shaft or journal G, similar to E', is provided with enlarged heads G', through which tie-rods F also pass, the said heads being slotted to receive the rods. This shaft or journal G engages a recess formed in a block H, slidably mounted between parts H', formed on the front of the frame. This block H is connected with a bolt H², which passes through a lug H³, formed integral with the frame. To this bolt is applied an adjusting-nut H⁴, located above the lug, and the lock-nut H⁵, located below the lug. It is evident that by virtue of this adjusting-bolt the block H, and consequently the journal G, may be raised and lowered at will. By virtue of this adjustment the relative arrangement of the shaft or journal E' with reference to a horizontal line I, passing through the center of the journal G, may be regulated at will. The farther the journal E' is below this line the farther will be the travel rearwardly and forwardly of the lower end of the jaw during the rotary movement of the eccentric driving-shaft B, as will be readily understood. It will also be understood that by keeping the journal E' continuously below the horizontal line I the travel of the lower extremity of the movable jaw will always be away from the stationary jaw A³ during the upward movement of the movable jaw, while during the downward movement of said jaw the lower extremity of the jaw will be toward the stationary plate A³. It is evident that if the journal E' were raised above the horizontal line I that the reverse of the fore-

going result would be true. Attention is called to these points in order to indicate the advantages of the capabilities of adjustment which my improved mechanism possesses.

The curved dotted line J is the arc of a circle struck from the center of the journal G. As the mechanism is arranged in the drawings the center of the shaft or journal E' will always be below the intersection of the lines I and J, and it is believed that the best results will be obtained when these conditions exist, for the reasons heretofore stated.

The journals or shafts G and E' are properly spaced on the tie-rods by means of pins K, passed through both extremities of the tie-rods outside of the enlargements F² and G'. Washers K² may be employed between the pins K and the parts G' in order to regulate the space between the stationary and movable jaws, which it is evident may be regulated at will. The pins K are of such size that they are breakable or adapted to be sheared off in case an object of unusual hardness passes between the two jaws of the crusher, whereby the breakage of important parts of the mechanism is prevented.

In the drawings I have shown a fly-wheel L and a driving-pulley M, mounted on the driving-shaft B. It is evident that the machine will be operated by applying power to the shaft B. During the rotation of this shaft and by virtue of the eccentric B', which engages the upper extremity of the movable jaw, as aforesaid, the said jaw is moved upwardly and downwardly and forwardly and rearwardly in a manner that will be well understood from what has already been stated.

Having thus described my invention, what I claim is—

1. In a rock-crusher, the combination with a suitable frame and a fixed jaw, a movable jaw, means for imparting a circular motion to one end of the movable jaw, means for causing the other end of said movable jaw to move on an arc whose center lies beyond the fixed jaw, and means for adjusting the center of said arc in a line substantially parallel with the face of said fixed jaw.

2. In a rock-crusher, the combination with a suitable frame and a fixed jaw, of a movable jaw eccentrically hung on a drive-shaft to cooperate with said fixed jaw, tie-rod mechanism connected to the frame and movable jaw to constitute a radius of movement for a portion of the latter, and means for adjusting the center of said radius of movement in a line substantially parallel with the face of said fixed jaw.

3. In a rock-crusher, the combination with a suitable frame and a fixed jaw, of a movable jaw eccentrically hung on a drive-shaft to cooperate with said fixed jaw, a tie-rod mechanism connected to the frame and movable jaw to constitute a radius of movement for a portion of the latter, means for adjusting the

center of said radius of movement in a line substantially parallel with the face of said fixed jaw and means for adjusting the length of the radius.

5 4. In a rock-crusher, the combination with a suitable frame and a jaw, of a movable jaw and means for imparting a circular motion to the upper end thereof, tie-rod mechanism attached to the front of the frame and hav-
10 ing a rod-and-socket connection with the lower portion of the movable jaw, and a spring connected to counteract the weight of the movable jaw and complete and maintain said rod-and-socket connection.

15 5. In a rock-crusher, the combination with a suitable stationary frame, of a movable jaw eccentrically hung from its upper extremity on a drive-shaft, and a tie-rod connection between the lower extremity of the jaw and the
20 front of the frame and consisting of two shafts connected by tie-rods, one shaft engaging the lower extremity of the jaw, and a block slidable vertically on the frame and forming a vertically-adjustable bearing for the other
25 shaft.

6. In a rock-crusher, the combination with a suitable stationary frame, of a movable jaw eccentrically hung from its upper extremity on a drive-shaft, two shafts having enlarged
30 extremities provided with openings, tie-rods passing through said openings and loose therein, means for regulating the space between the shafts on the tie-rods, one of the shafts engaging the movable jaw, a block ver-

tically slidable on the frame, in which block 35 the other shaft takes bearing, and means for actuating the said block.

7. In a rock-crusher, the combination with a suitable stationary frame, of a movable jaw eccentrically hung from its upper extremity 40 on a drive-shaft, two shafts whose extremities are provided with openings, tie-rods passing through said openings, means for spacing the shafts on the tie-rods, one shaft engaging the movable jaw, a block vertically 45 movable on the frame and forming the bearing for the other shaft, a threaded bolt connected with the said block and passing through a lug with which the frame is provided, the said bolt having nuts both above 50 and below the lug for adjusting purposes.

8. In a rock-crusher, the combination of a stationary jaw having a vertically-disposed face, a movable jaw eccentrically hung from its upper extremity on a drive-shaft, auxili- 55 ary shafts engaging the two jaws, tie-rods connecting said auxiliary shafts, means mounted on the rods for regulating the relative position of the two jaws so far as the space between them is concerned, and means 60 for vertically adjusting the auxiliary shaft adjacent the stationary jaw.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. ELSPASS.

Witnesses:

DENA NELSON,

OTTO E. HODDICK.