

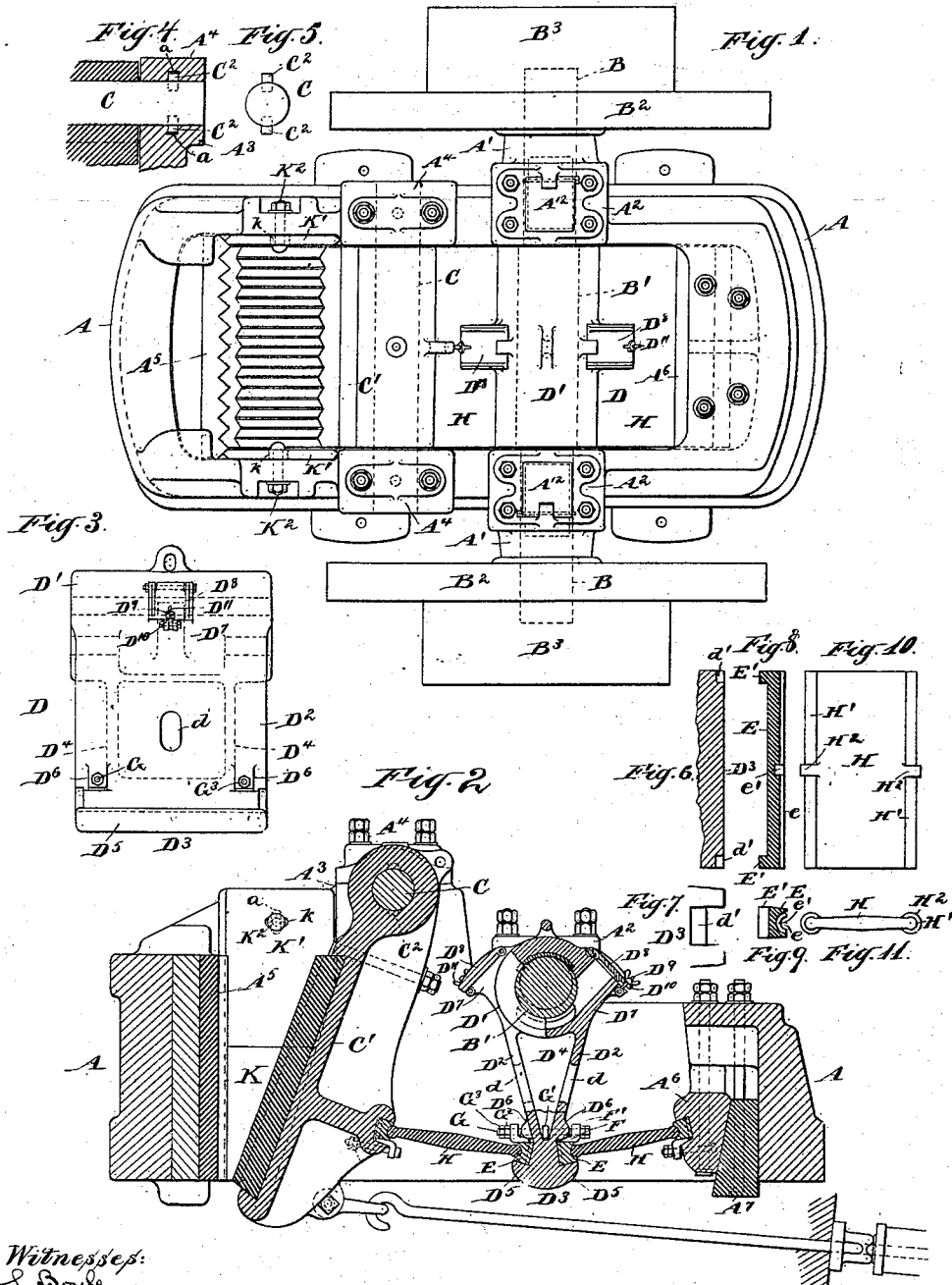
**No. 650,105.**

**Patented May 22, 1900.**

**E. C. BACON.**  
**ROCK CRUSHER.**

(Application filed Oct. 12, 1899.)

(No Model.)



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## ROCK-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 650,105, dated May 22, 1900.

Application filed October 12, 1899. Serial No. 733,350. (No model.)

*To all whom it may concern:*

Be it known that I, EARLE C. BACON, a citizen of the United States, residing in the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Rock-Crushers, of which the following is a specification.

The invention relates to that class of crushers in which a swinging jaw is moved toward and from a fixed jaw by the action of a pitman and toggles.

The object of the invention is to provide a construction in which the strains shall be distributed to better advantage and the liability of accident by displacement due to vibration shall be lessened.

It consists in special provisions for holding the parts against loosening and in a novel construction of pitman in which the metal is disposed in a manner attaining the greatest economy in material and resistance to the strains to which this portion of the mechanism is subjected and will be hereinafter fully described.

The accompanying drawings form a part of this specification and show the invention as I have carried it out.

Figure 1 is a plan view, and Fig. 2 a vertical longitudinal section, of the complete crusher. The remaining figures show portions detached. Fig. 3 is a face view of the pitman for operating the toggles. Fig. 4 is a section through one of the shaft-bearings and immediately-adjacent parts, and Fig. 5 is a corresponding end view of the shaft. Fig. 6 is a sectional view of a portion securing the toggle-bearing, and Fig. 7 is a corresponding side view. Fig. 8 is a longitudinal section through the toggle-bearing, and Fig. 9 is an end view of the same. Fig. 10 is a face or plan view of one of the toggles, and Fig. 11 is a corresponding edge view. Figs. 6, 8, and 10 and 7, 9, and 11 show these parts in relative positions but separated.

Similar letters of reference indicate like parts in all the figures.

The main frame of the crusher, which may be the usual heavy casting, is marked A and is provided with bearings A' for the driving-shaft B, carrying the operating-eccentric B' and fly-wheels and driving-pulleys B<sup>2</sup> B<sup>3</sup>, and

with bearings A<sup>3</sup> for the swing-jaw shaft C. It also carries the fixed-jaw plate A<sup>5</sup> and the toggle-block and toggle-wedge A<sup>6</sup> and A<sup>7</sup>, adjusted by stud-bolts and nuts.

The strains to which the pitman D is subject are always tensile from the head portion D', inclosing the eccentric B', downward to the toggle-bearings E, carried at its lower end. I have devised a form in which the metal is so distributed as to give unusual strength with the least amount of material, thus considerably lessening the weight and cost of this portion. It consists of a heavy tubular head D' receiving the eccentric B', having webs D<sup>2</sup> extending tangentially downward therefrom, inclined toward each other, and joined at the lower end D<sup>3</sup> of the pitman. The webs D<sup>2</sup> are strengthened by the transverse webs D<sup>4</sup>, closing the ends and forming a hollow casting from which the core is removed through the openings d, as will be understood.

D<sup>5</sup> D<sup>5</sup> are flanges extending across the faces of the webs D<sup>2</sup> below their line of junction and serve to support the toggle-bearings E E, which are adjusted and locked in place by the wedges F, inserted between the upper faces of the toggle-bearings and the under faces of the overhanging swells D<sup>6</sup>, formed on the faces of the pitman. The toggle-bearings are trapezoidal in cross-section, and the faces of the flanges D<sup>5</sup> and wedges F are correspondingly shaped, so that the latter are drawn inward. The bearings are securely locked against outward movement. The adjustment is effected by a bolt G, passing through the pitman and the vertical arms F' of both wedges and provided with nuts G<sup>2</sup> and check-nuts G<sup>3</sup> on the outer ends. A central-nut G', lying between the webs D<sup>2</sup> near their point of convergence, serves to prevent longitudinal movement of the bolt. There may be as many sets of the bolts and wedges as are found necessary or desirable. I have shown two sets, one at each side, outside the webs D<sup>4</sup>.

D<sup>7</sup> D<sup>7</sup> are centrally-arranged swells on the head D', affording large openings through which access may be had to the interior and grease or other lubricant liberally supplied. Each has a hinged close-fitting cover D<sup>8</sup>, held in the tightly-closed condition by the swing-

bolt D<sup>9</sup>, pivoted to the under faces of each swell and fitting into a deep notch D<sup>10</sup> in the overhanging edge of the cover and holds the latter in contact with its seat by the thumb-nut D<sup>11</sup>. To expose the openings, it is only necessary to slacken the thumb-nuts sufficiently to allow the bolts to fall clear of the notches D<sup>10</sup>, and the covers may then be raised.

To prevent endwise movement of the toggle-bearings due to vibration, I provide at each end a rearwardly-extending lug E', which is received in a corresponding cavity d' at each side of the lower end D<sup>8</sup> of the pitman.

When thus engaged, it is obviously impossible for the bearings to "crawl" transversely of the pitman, and to prevent similar movements of the toggles H, I provide them at about the mid-width each with a circular lug or projection H<sup>2</sup>, encircling the rounded bearing edges H' and matching to a corresponding cavity e', formed in the groove e on the working face of the toggle-bearing. Both edges of each toggle are similarly equipped, and the bearing-blocks in the swing-jaw C' and toggle-block A<sup>6</sup> are shaped to match. The keys for holding the bearing-blocks in the jaw and in the toggle-blocks, as shown, are practically the same and operate in a similar manner to those on the pitman, being varied only so much as is necessary by reason of their situation. In order to avoid endwise movements of the jaw-shaft C, I introduce a pair of oppositely-placed dowel-pins C<sup>2</sup> at each end and drill or otherwise produce corresponding holes a in the bearings A<sup>3</sup> and caps A<sup>4</sup>, in which they are received and held. It is found in practice that the lower portions of the side cheeks K adjacent to the jaws are worn much faster than the upper portions, for the reason that a greater proportion of the work is performed at this low point. Another source of trouble due to vibrations is the tendency of the cheeks to rise, and thus loosen the fixed-jaw plate A<sup>5</sup>, allowing it to move idly backward and forward and correspondingly reducing the efficiency of the crusher until these parts are again replaced. For economy in the cheeks and also to guard against the movement described I provide each cheek with a follower K', which is, in effect, a continuation of the cheek, and produce in each follower an elongated hole or short slot k, matching to a corresponding slot a in the frame formed at a right angle to the slot k and receiving a bolt K<sup>2</sup>, thrust through both slots at their point of crossing

and secured by a nut and check-nut, as shown. Thus formed the lower portion K may be renewed when worn, and both cheek and follower are securely held in place. The arrangement of cross-slots insures an opening for the bolt K<sup>2</sup>, even though the parts may not be an exact fit.

The caps A<sup>3</sup> for the driving-shaft bearing A' are provided with openings somewhat similar to those on the pitman-head and are closed by covers A<sup>12</sup>, as before, but omitting the locking device. The latter will not be generally required, as the caps are stationary, but may be added, if found desirable. Lubricants may be supplied in large quantities through these openings, and the closely-fitting covers serve to exclude the dust and grit to which this class of machinery is peculiarly exposed.

All portions not particularly described will be understood to be of any ordinary or approved construction.

Modifications may be made in the forms and proportions within wide limits as will be found necessary in adapting the invention to machines of various sizes and special constructions.

I claim—

1. In a crusher, of the character set forth, the pitman described, consisting of the tubular head D' inclosing the eccentric B' converging webs D<sup>2</sup> extending tangentially from the head and joined at the lower end D<sup>3</sup>, the transverse webs D<sup>4</sup>, the toggle-bearings E, flanges D<sup>5</sup> supporting the latter, swells D<sup>6</sup> formed on the pitman in proximity to said flanges, wedges F F', and bolts G extending through said converging webs and said wedges, the inner nuts G' on said bolts and the outer nuts G<sup>2</sup> thereon, all combined and arranged to serve substantially as herein specified.

2. In a crusher of the character set forth, a toggle-bearing E, a support therefor, lugs E' E' on said bearing and cavities on said support receiving said lugs and holding said bearing against endwise movement, in combination with each other and means for locking said bearing to said support, all substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in the presence of two witnesses.

EARLE C. BACON.

Witnesses:

CHARLES R. SEARLE,  
A. L. BOYLE.