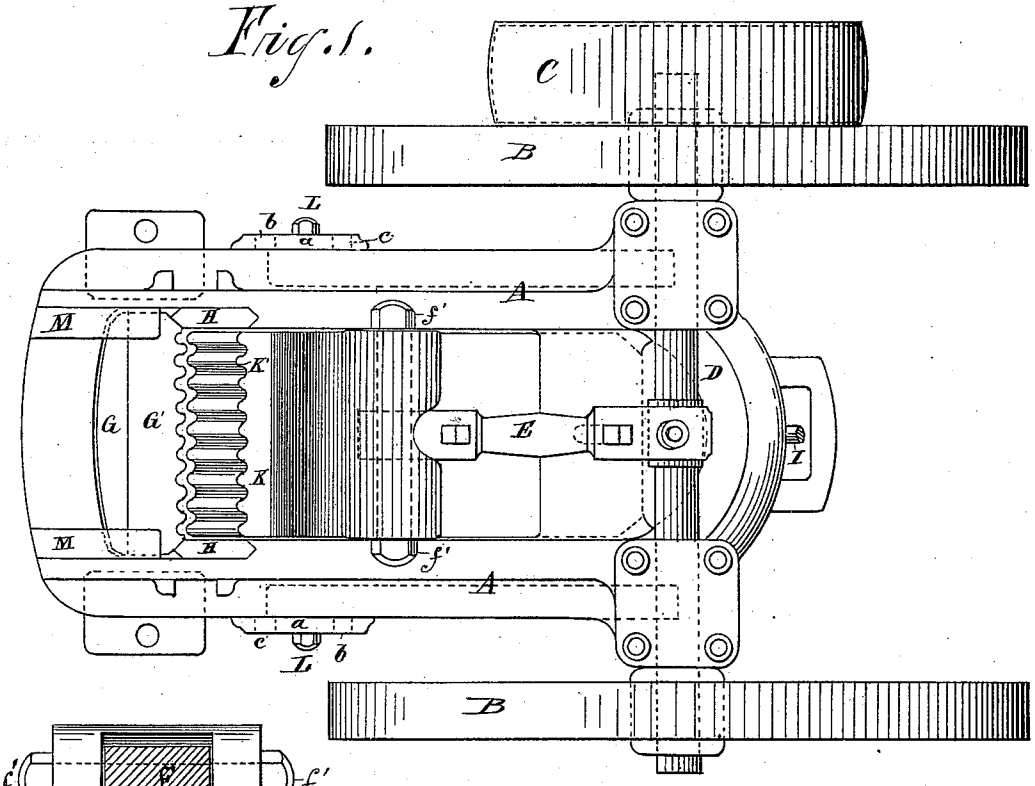
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S. L. MARSDEN.

STONE AND ORE BREAKER.

No. 361,173. Patented Apr. 12, 1887.

Fig. 1.



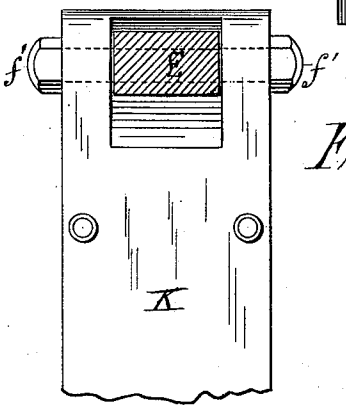


Fig. 3.

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N. PETERS. Photo-Lithographer. Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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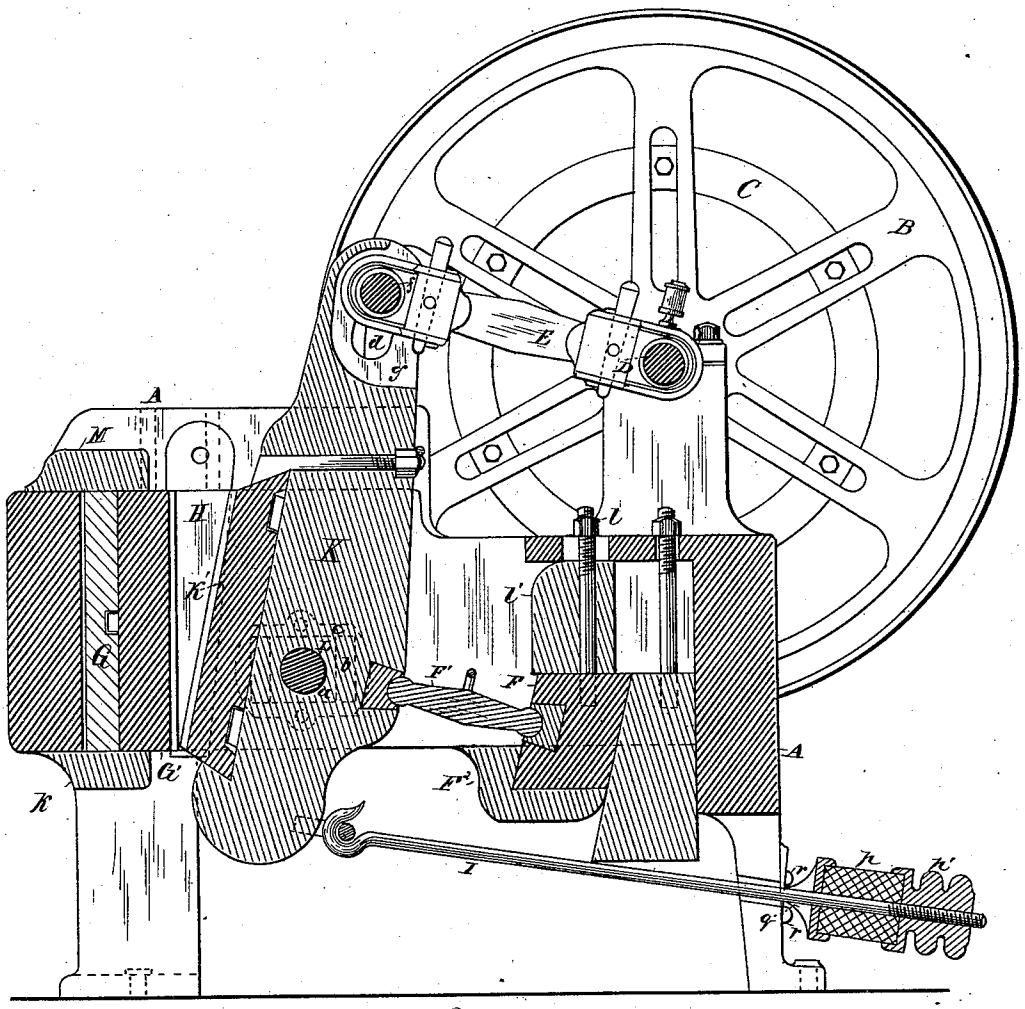


fig. 2.

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UNITED STATES PATENT OFFICE.

SAMUEL LOWE MARSDEN, OF NEW HAVEN, CONNECTICUT.

STONE AND ORE BREAKER.

SPECIFICATION forming part of Letters Patent No. 361,173, dated April 12, 1887.

Application filed May 4, 1886. Serial No. 201,033. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL LOWE MARSDEN, a citizen of the United States of North America, and a resident of New Haven, county of New Haven, State of Connecticut, have invented a new and useful Improvement in Stone and Ore Breakers, of which the following is a specification.

This invention relates to an improvement in that class of stone and ore breakers called "jaw-crushers;" and its objects are to increase the effectiveness of the breaker for certain work, to relieve the strain upon certain of the working parts, and to make the machine more durable.

The invention consists in the peculiar combinations and the novel construction and arrangement of parts, all as more fully hereinafter described and claimed.

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

Figure 1 is a plan of my improved stone breaker or crusher. Fig. 2 is a sectional side elevation thereof. Fig. 3 is an enlarged rear view of the top of the movable jaw.

In the drawings, A represents the frame of the machine, B B the fly-wheels, C the driving-pulley, D the crank-shaft, E the pitman, F the toggle-block, F′ the toggle, G the fixed jaw, G′ the fixed-jaw plate, H the cheeks, and I the tension-rod, all of which are parts well known and understood, and hence require no further description herein.

I pivot the movable jaw at a point between the upper and lower end, on a pivot, L, which passes transversely through it, and has end bearings in boxes *a*, which have room to slide longitudinally forward and backward in openings *b*, which are made in the opposite sides of the frame A, and are covered by caps *c* to keep the dust out. This makes of said jaw a lever with sliding fulcrum. Transversely through the upper end of this movable jaw K a vertical slot, *d*, is made, and through this is passed the pitman wrist-pin *f*, by means of which motion is transferred from the pitman. This wrist-pin *f* may be set in the upper or lower part of the slot *d*, or intermediate between the two points, and the jaw K be firmly secured in place thereon by tightly turning up the nuts *f′ f′*, and, if necessary, set-screws, screw-bolts, wedges, or other devices may be used to keep the jaw and wrist-pin in their desired relative positions. A recess, *g*, formed in the upper part of the jaw K, affords room for the free motion of the pitman held therein.

As shown in the drawings, the wrist-pin *f* is engaged in the extreme upper part of the slot *d*, and the pivot or fulcrum L is somewhat below the longitudinal center of the jaw and above the horizontal line of the toggle F′, in such relative position to said toggle that on the extreme downward and backward throw of the pitman, and the consequent forward motion of the lower end of the said jaw K, the toggle F′ will be brought gradually into a horizontal position by the motion of the jaw, with the effect of forcing the lower portion of the jaw forward, and to operate with straight rigid thrust to support or back up the action of the lower part of said jaw at the moment when its crushing force should be most absolute. It will be evident, the throw of the top of the jaw being the same, that the movement of that part below the pivot or fulcrum would be increased by placing the pivot higher in the jaw, and would be decreased by placing it lower; hence the location of said pivot by determining the range of the oscillation of the lower part of the said jaw, determining the closeness of its approach to the fixed jaw, will gage the fineness of the crushed material delivered by the machine.

The movable jaw being fulcrumed, as shown, every point on it and the jaw-plate K′ describes an arc of a circle when the jaw is in motion, so that a rubbing effect is constantly produced upon the stone or other material between the jaws, whereby it is more finely broken or pulverized than it would be simply by the thrust of the toggle. It will be seen, also, that if the wrist-pin *f* is fixed in the lower part of the slot *d* the swing of the jaw will, when the machine is at work, be through a greater arc than when the said wrist-pin is in the upper part of said slot, as shown, and more power will be required to produce like crushing effect; hence it is obvious that by the adjustment of the said pin in the said slot the distance between the jaws at the top may be regulated for receiving larger

or smaller pieces of stone to be crushed, and the distance at the bottom be adjusted for finer or coarser crushing, and the expenditure of power for certain effects be increased or reduced.

There is but little working strain on the fulcrum or pivot L, as it simply turns in its bearings with the oscillation of the jaw K, the crushing strain being taken by the toggle F'.

k are ears cast on the frame, and on which rests the lower end of the jaw-plate G'.

M are caps formed either separate or as integral parts of the frame, and which serve to hold the said jaw-plate down.

The toggle-block F is supported in a shoe, F^2, and is vertically adjustable, as usual, by means of an attached screw bolt and nut, *l*; but in order to positively secure it from accidental upward movement I introduce a stop-block, *l'*, between its top and the frame of the machine, as shown in Fig. 2.

p is a spring, *p'* a nut, and *q* a conical cap on the rod I, and *r r* are bosses on either side above and below the rod-aperture in the crusher-frame, so that when the forward motion of the swinging jaw draws the rod forward the inclined planes of the cap *q* come in contact with the bosses *r* near their apices, and the pressure upon the spring *p* is consequently at and from the beginning gradual, and at the same time the said bosses keep the cap from being drawn into and caught in the rod-aperture.

Wherever in the appended claims I refer to the movable jaw as being centrally pivoted I wish to be understood as meaning pivoted between its upper and lower ends and substantially in the longitudinal center of its working or crushing part.

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

1. The combination, with the centrally-pivoted movable jaw, of a pitman attached to the upper part thereof, and a tension-rod attached to the lower part of said jaw, substantially as described.

2. The combination, with the movable jaw centrally pivoted on a horizontal sliding pivot, of said pivot, a tension-rod attached to the lower part of said jaw, and a vertically-adjustable pitman connected with the upper end of said jaw, substantially as and for the purpose specified.

3. The combination, with the movable jaw centrally pivoted on a sliding pivot and formed near its upper end with vertical slot *d* and recess *g*, of said pivot, the pitman, and the pitman wrist-pin passed through said slot and provided with nuts, substantially as and for the purpose specified.

4. The combination of the centrally-pivoted movable jaw, a pitman attached to the upper part thereof, a tension-rod attached to the lower part of said jaw, and a toggle connected with said jaw between said pitman and tension-rod, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 6th day of February, 1886.

SAML. LOWE MARSDEN.

Witnesses:
JACOB J. STORER,
PHILIP D. WHELPLEY.