

(No Model.)

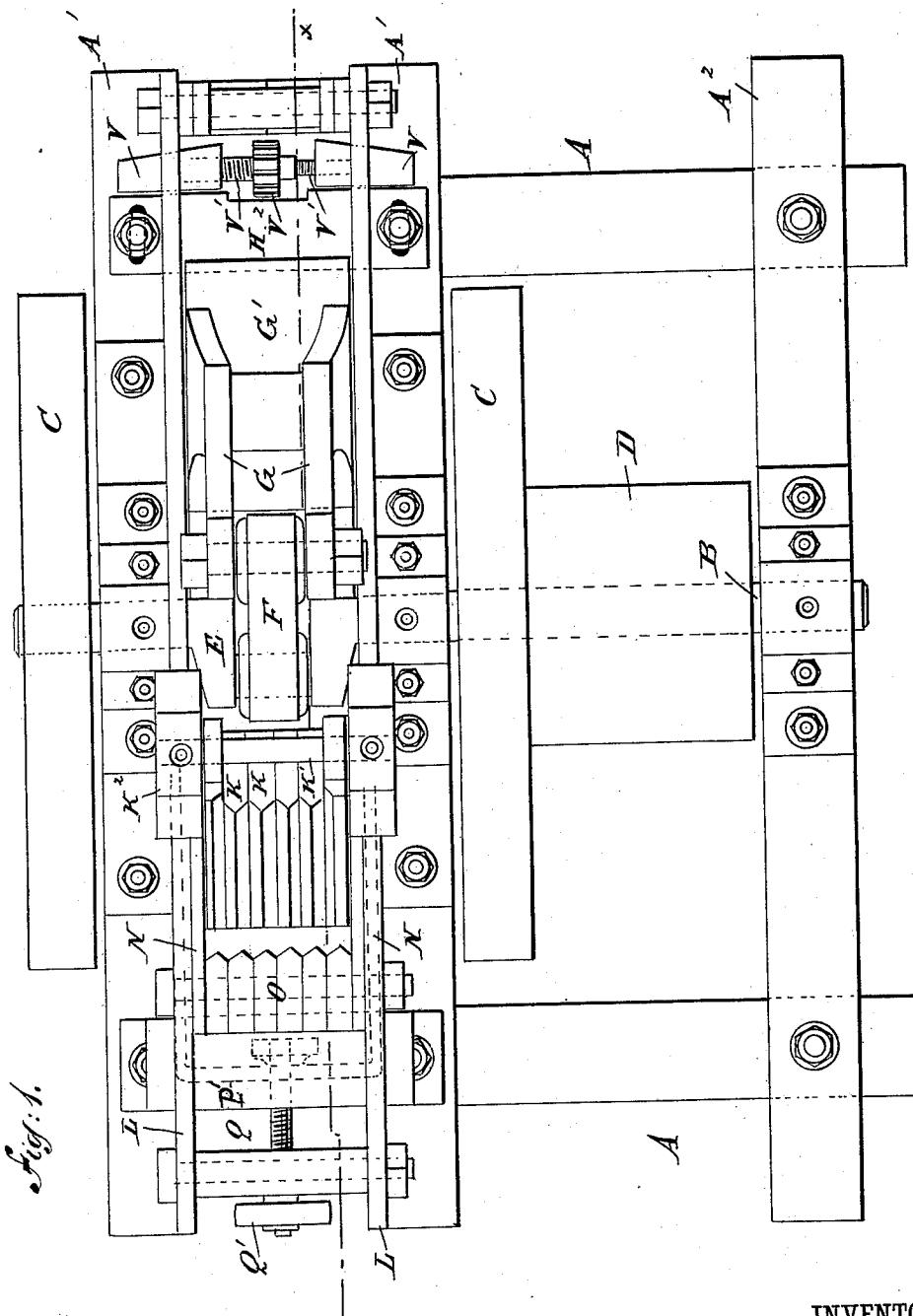
3 Sheets—Sheet 1.

F. L. PRESTON.

BREAKER AND CRUSHER.

No. 383,986.

Patented June 5, 1888.



WITNESSES:

*Chas. N. Niss*  
*C. Sedgwick.*

INVENTOR:

*F. L. Preston.*

BY

*Munn & Co.*  
ATTORNEYS.

(No Model.)

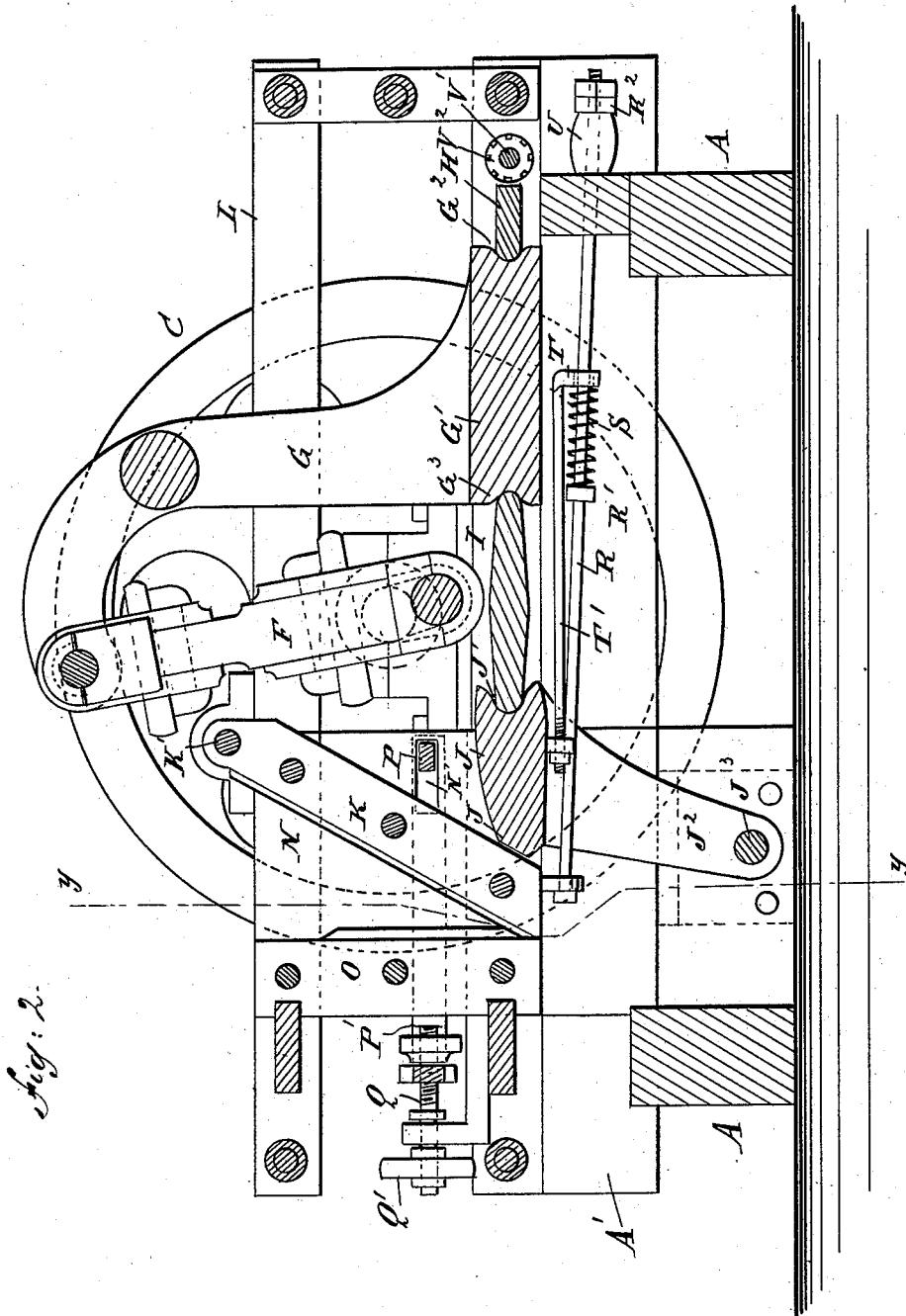
3 Sheets—Sheet 2.

F. L. PRESTON.

## BREAKER AND CRUSHER.

No. 383,986.

Patented June 5, 1888.



**WITNESSES:**

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(No Model.)

3 Sheets—Sheet 3.

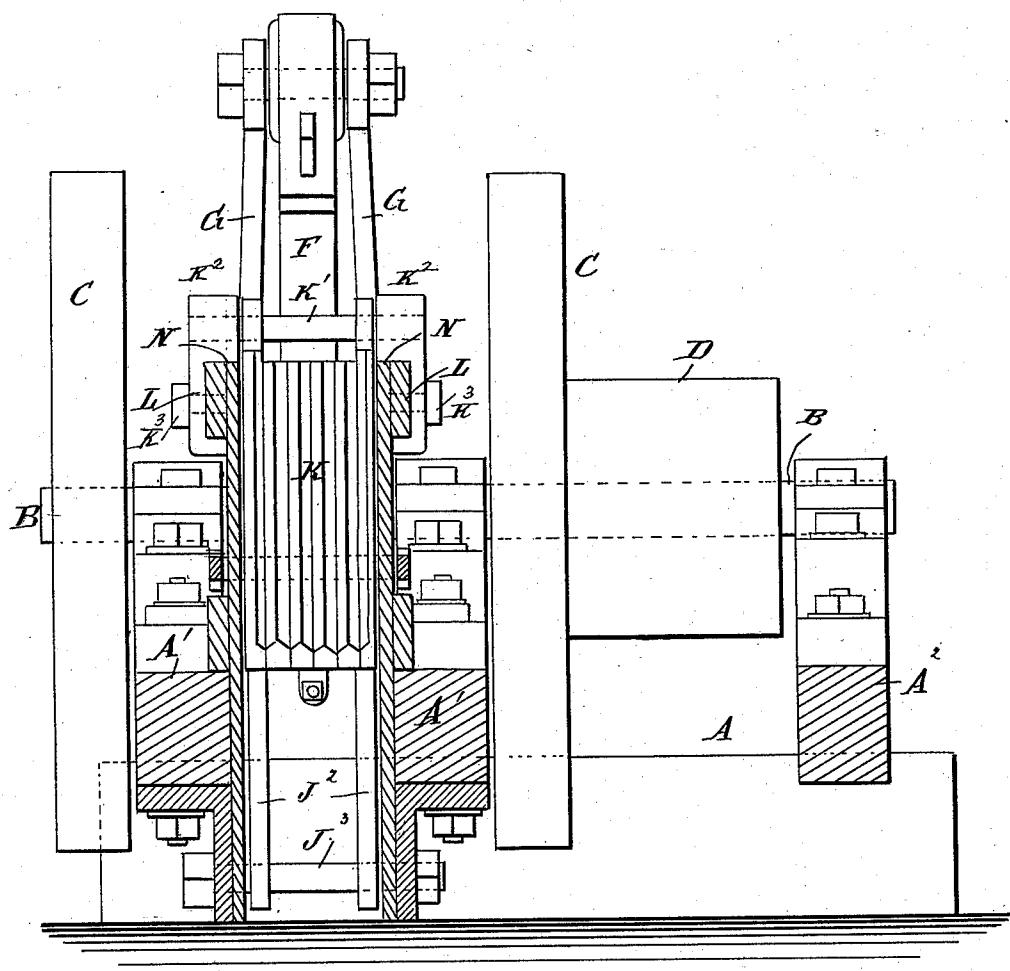
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Fig: 3



WITNESSES:

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# UNITED STATES PATENT OFFICE.

FREDERICK L. PRESTON, OF DARIEN, WISCONSIN.

## BREAKER AND CRUSHER.

SPECIFICATION forming part of Letters Patent No. 383,986, dated June 5, 1888.

Application filed April 27, 1887. Serial No. 236,320. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK L. PRESTON, of Darien, in the county of Walworth and State of Wisconsin, have invented a new and Improved Breaker and Crusher, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved machine for breaking and crushing rocks, ores, &c., the machine being simple and durable in construction, very effective in operation, and requiring very little power.

The invention consists in the construction and arrangement of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

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

Figure 1 is a plan view of my improvement. Fig. 2 is a longitudinal sectional elevation of the same on the line *x x* of Fig. 1, and Fig. 3 is a vertical cross-section of the same on the line *y y* of Fig. 2.

The frame which supports my improved breaker and crusher consists of the cross-beams A, on which are secured the longitudinal beams A', A', and A'', supporting suitable bearings, in which is mounted a transverse shaft, B, carrying the fly-wheels C and the driving-pulley D, connected by a belt with suitable motive power for operating the breaker and crusher. Between the longitudinal frame-beams A' A' on the shaft B is formed a crank-arm, E, connected by the upwardly-extending pitman F with the upper end of the lever G, bent in such a manner as to extend downward, and carrying on its lower end a plate, G', provided at its rear end with a transverse half-round groove, G'', fitting upon the cross-plate H, secured by bolts and nuts to the longitudinal beams A' A' of the frame. The cross-plate H forms the fulcrum for said lever G.

In the front edge of the plate G' is formed a transverse half-round groove, G'', in which fits one end of the link-plate I, fitting with its other end into a transverse half-round groove, J', formed in one edge of the plate J, supported by the arm J'', extending downward from said

plate J and pivoted on the rod J''. The front end of the plate J is slightly beveled, and adapted to impart a forward motion to the lower end of the vibrating-jaw K, held in an inclined position, being pivoted at its upper end to the pin K', supported by the bearings K'', held longitudinally adjustable on the upper side beams of the frame L, secured by suitable means to the longitudinal beams A' A''. The bearings K'' are adapted to extend downward and in under the said upper side beams of the frame L, as seen in Fig. 3, and are provided with adjusting-screws K'' K'', which enter apertures in said side beams, whereby, as above intimated, they are rendered longitudinally adjustable. The jaw K operates between the fixed side plates, N, secured to the said frame L, and between said fixed plates N is held the fixed jaw O, arranged in front of the jaw K. Said plates N and the jaws K O form a wedge-shaped receptacle, into which the ore, rock, or other material to be crushed is to be placed.

The jaws K O are each provided with corrugations at their inner sides, which face each other and can be formed in a solid plate, or said jaws may be composed of plates, as shown in the drawings, provided on their inner faces with sharp edges, thus forming the corrugations. The several plates of the jaws O are fastened together by bolts or other suitable means. The return motion of the jaw K is limited by a cross-bar, P, extending across the rear edge of the jaw K and held adjustably in the longitudinal groove N', formed in the fixed side plates, N.

The cross-bar P is connected at its outer ends with a U-shaped arm, P', through the middle part of which screws the screw Q, adapted to turn in a suitable bearing formed on the frame L, said screw Q being provided at its outer end with a hand-wheel, Q', for turning the screw. The U-shaped arm P' extends around the sides N and the outer edge of the jaw O. To the lower end of the jaw K is secured one end of a rod, R, passing at its other end through the cross-beam A, and carrying on its outer end the nuts R'', which screw against a spring, U, held between said nuts and the outer face of the cross-beam A. On the rod R is also secured a collar, R', against

which rests one end of the spring S, coiled on said rod R, and pressing with its other end against the collar T, secured to the rod T', connected with the under side of the plate J. 5 As the plate J is required to travel twice the distance as that traveled by the jaw K, the joint tension of both of the springs S U is utilized to actuate said plate, both being upon the same or a common rod, R.

10 The cross-plate H can be moved forward, so as to take up any slack or wear at the fulcrum-point of said plate H and the plate G' of the lever G. The means for moving the bar H forward consists of the wedges V passing 15 through the lower side bars of the frame L and resting with one edge against said cross-bar H. Into the inner ends of the wedges V screws the screw V', provided with the wheel V<sup>2</sup>, which, when turned in one direction, causes 20 the wedges V to move outward, thus pressing against the cross-bar H.

The operation is as follows: The breaker and crusher is set in motion by rotating the shaft B, whereby the crank-arm E imparts a 25 rocking motion to the lever G by the pitman F, said lever G swinging, with its plate G', on the fixed bar H as a fulcrum. The lever G imparts a rocking motion to the plate J, secured to the pivoted arm J<sup>2</sup> by the intermediate link-plate, I, against which said plate J is held by the action of the spring S pressing 30 against the collar T, secured to the rod T' fastened on said plate J. As the latter has its front end in contact with the lower free end of 35 the jaw, said plate J imparts a swinging motion to said jaw K toward and from the vertical fixed jaw O. The ore, rocks, or other similar material held in the wedged-shaped receptacle formed by the fixed plates N, the 40 vertical jaw O, and said vibrating jaw K is pressed by the latter against the fixed jaw O, and is thus broken between the corrugations of said jaws K O near their upper parts. The material near the lower parts of said jaw K 45 and the jaw O is crushed as the jaw K in its forward stroke comes nearly in contact at its lower end with the lower end of the fixed jaw O. The jaw K in its return-stroke opens sufficiently to permit part of the crushed material 50 to drop out between the lower ends of the jaws. When the lever G imparts the forward stroke to the plate J and the jaw K, then the springs U and S are compressed, so that they exert a return pressure against said jaw K and the plate J when the lever G is on its return-stroke and does not act on the plate J. The 55 distance which the jaw travels in its return-stroke is regulated by the cross-bar P, against

which rests the rear edge of the jaw K when in its innermost position. The cross-bar P is adjusted forward and backward by turning the hand-wheel Q' so that the screw Q moves the U-shaped arm P', connected with said cross-bar P, forward and backward, thus regulating the return movement of the jaw K. 65

The wear on the fixed plate H and the lever-plate J' can be taken up by turning the wheel V<sup>2</sup>, so that the screw V' forces the wedges V outward, thus pressing the fixed plate H forward toward the link I, the nuts and bolts fastening 70 said plate H to the beams A' having been previously sufficiently unscrewed to permit said motion of the plate H.

Having thus described my invention, what I claim as new, and desire to secure by Letters 75 Patent, is—

1. In a breaking and crushing machine, a fixed corrugated jaw, fixed side plates between which said jaw is held, and an inclined vibrating jaw pivoted at its upper end, in combination with a pivoted pushing-plate operating against the lower end of said vibrating jaw, a bent lever, the main shaft, the pitman connecting said bent lever and main shaft, and an intermediate link-plate connecting said pushing- 85 plate with the lower plate of the bent lever, substantially as shown and described.

2. In a breaking and crushing machine, the combination, with the vibrating jaw K and the side plates, N, between which said jaw K 90 operates, and having slots N', of the cross-bar P, held to slide in said slots N', the U-shaped arm P', connected at its outer ends with said cross-bar P, and the screw Q, having the hand-wheel Q', adapted to move said U-shaped arm 95 forward and backward, so as to adjust the cross-bar P in relation to the jaw K, substantially as shown and described.

3. In a breaking and crushing machine, the vibrating jaw K, the adjustable cross-bar P, 100 adapted to limit the return motion of said vibrating jaw K, and the swinging plate J, operating against the free end of said vibrating jaw K, mechanism for vibrating said plate J, in combination with the rod R, the spring U, held 105 on said rod R and adapted to be pressed by the forward motion of said crushing-lever K, the spring S, held on said rod R, and the rod T', having the collar T, pressing the spring S by the forward motion of said swinging plate J, 110 substantially as shown and described.

FREDERICK L. PRESTON.

Witnesses:

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BETTIE C. WILLIAMS.