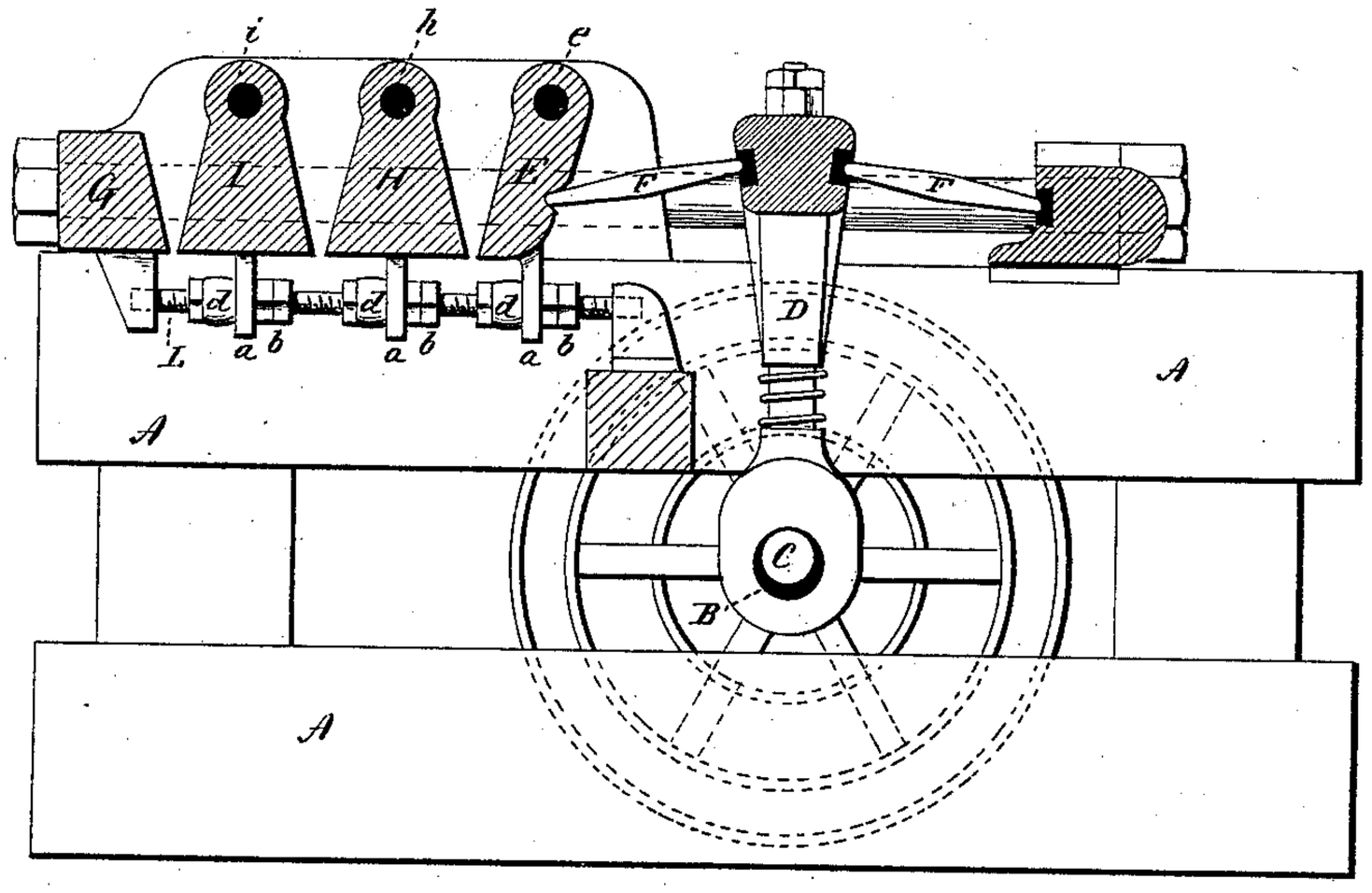
(No Model.)

T. A. BLAKE.

STONE CRUSHER.

No. 256,959. Patented Apr. 25, 1882.



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THEODORE A. BLAKE, OF NEW HAVEN, CONNECTICUT.

STONE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 256,959, dated April 25, 1882.

Application filed August 13, 1881. (No model.)

To all whom it may concern:

Be it known that I, THEODORE A. BLAKE, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Stone-Crushers; and I do hereby declare the following, when taken in connection with the accompanying drawing and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawing constitutes part of this specification, and represents a longitudinal central section.

This invention relates to an improvement in that class of stone or ore crushers commonly known as the "Blake crusher."

In the use of this class of crushers several difficulties exist. For instance, in crushing fine work the machine is necessarily slow in its production. Again, while the machines are adapted to crushing very hard material and are run accordingly, it frequently occurs that a piece of material harder than the machine can crush wedges between the jaws, so that when the power is applied the movable jaw cannot be advanced. The result of this is that some part of the machine must give way, unless perchance the belt slips. Generally something breaks.

The object of this invention is to overcome these difficulties, first, by increasing the production of a machine set for a given size, and also to prevent accidents occasioned by clogging the jaws. The invention consists essentially of a vibrating jaw to which the power is applied, a stationary or resisting jaw combined with one or more jaws hung between said vibrating jaws and stationary jaws, upon axes parallel with the axis of the vibrating jaw, and so that material placed between the vibrating jaw and the next swinging jaw will communicate the swinging movement of the vibrating jaw to the second, the second to the third, and so on toward the stationary jaw, the stationary jaw forming the resistance for the last swinging jaw, and each swinging jaw resistance for the swinging or vibrating jaw next in rear of it, as more fully hereinafter described.

A represents the frame of the machine, which is of the usual form, and carries on suitable bearings the driving-shaft B, on which is an eccentric, C, working a pitman, D, which operates the vibrating jaw E by means of a toggle, F F, in the usual manner well known in the Blake crusher. Instead of arranging the stationary jaw G so near the vibrating jaw E that the crushing will be done between said vibrating and stationary jaws, I arrange the stationary jaw G at a distance from the vibrating jaw E, and between the two I arrange several jaws, H I, hung respectively upon axes *h i*, parallel with the axis *e* of the vibrating jaw E. Each of the jaws H I hang entirely independent of the vibrating jaw E, their surfaces corresponding to the surfaces of the adjacent jaw, so that the space between each jaw and the next correspond to the usual opening or space between the jaws of the Blake crusher.

Below the jaws, or at some convenient point, a longitudinal stationary rod, L, is arranged, which passes through the arms *a*, extending down from the jaws E H I. The rod L is screw-threaded, and in rear of each arm *a* are adjusting or set nuts *b*, which form stops for the rear movement of the jaws—that is to say, so that each jaw comes to a bearing against its own nut when it has completed its rear movement. Forward of each arm *a* is a spring, *d*, against which each arm bears in its forward movement, and each of which readily yields to the pressure applied to the moving jaws. Suppose, for illustration, the delivery-mouth between the jaws is required to be one-eighth of an inch and the movement of each jaw in the crusher to be one-eighth of an inch. The mouth or delivery between the jaws then in their normal condition will be one-fourth of an inch, and the movement of the first jaw, E, or the stroke on the machine will be three-eighths of an inch. In ordinary work the resistance will be the same between all the jaws, the first jaw will move three-eighths of an inch, carrying the second jaw two-eighths of an inch, that forcing the third jaw one-eighth, and the work will progress accordingly; but should there come between either of the jaws—say as between H and I—a material so hard as not to be affected by the crushing-power, the result will be that the full movement of the jaw H two-eighths will be communicated to the jaw I and carry that jaw one-eighth nearer its next,

(or in this case the stationary jaw G,) and will so continue to work until the obstruction be removed; or the jaw E will move a little nearer the jaw H than before, dividing the space between the then two working-mouths, and so will draw from each one-sixteenth of an inch, instead of one-eighth, when all were working. In any such case the extra resistance between any two working-surfaces is received or taken up by the others, whereas if it were not for this capacity of communicating its movement to the next jaw, or of the resistance being taken up, the power forces the same extent of movement, and something breaks or gives way.

The capacity of the machine over a single vibrating jaw is increased in proportion to the number of intermediate jaws, so that a single machine with the two intermediate jaws will produce three times the amount of work that a single vibrating jaw can.

The nuts *b* on the rod L permit the adjustment of the jaws so that the delivery-mouth may be varied according to the work required—that is, they may be set nearer to or farther from each other. In such adjustment the pressure of the spring should also be readjusted by the nuts against which the springs bear.

While I have described this invention as applied to vibrating jaws, it will be readily understood by those familiar with the art that the same invention may be applied to other known movable jaws.

I claim—

1. The herein-described improvement in stone or ore crushers, consisting in a stationary and a movable jaw, combined with one or more jaws arranged intermediate between said movable and stationary jaws, and adapted to receive crushing movement from said movable jaw, substantially as described.

2. The herein-described improvement in stone or ore crushers, consisting in a stationary and a movable jaw, combined with one or more jaws arranged intermediate between said movable and stationary jaws, and adapted to receive crushing movement from said movable jaw, and mechanism, substantially such as described, to adjust the position of the said jaws relatively to the stationary jaw, substantially as described.

THEODORE A. BLAKE.

Witnesses:

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