

(No Model.)

T. A. BLAKE.

STONE CRUSHER.

No. 308,234.

Patented Nov. 18, 1884.

Fig. 1

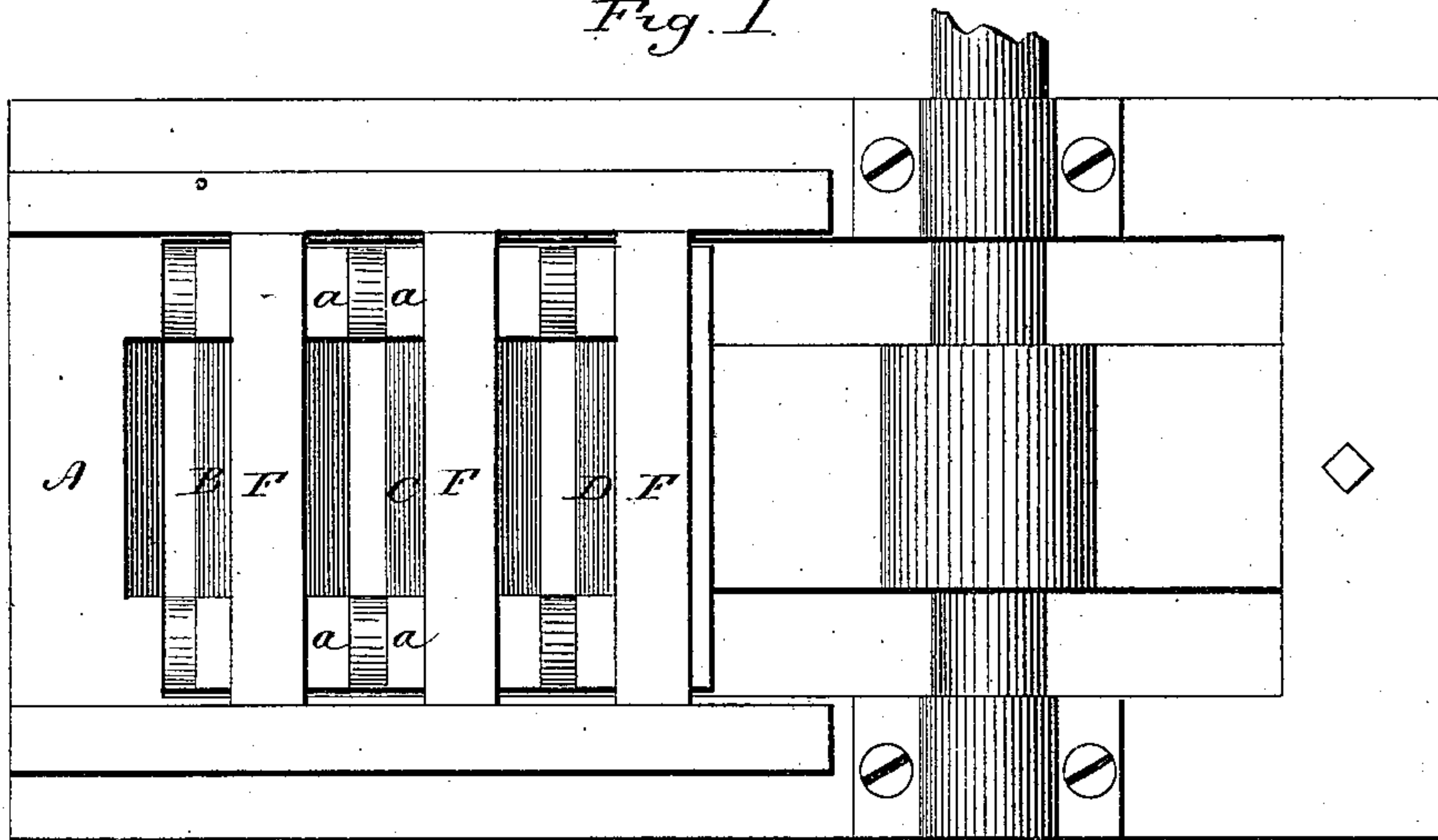


Fig. 2

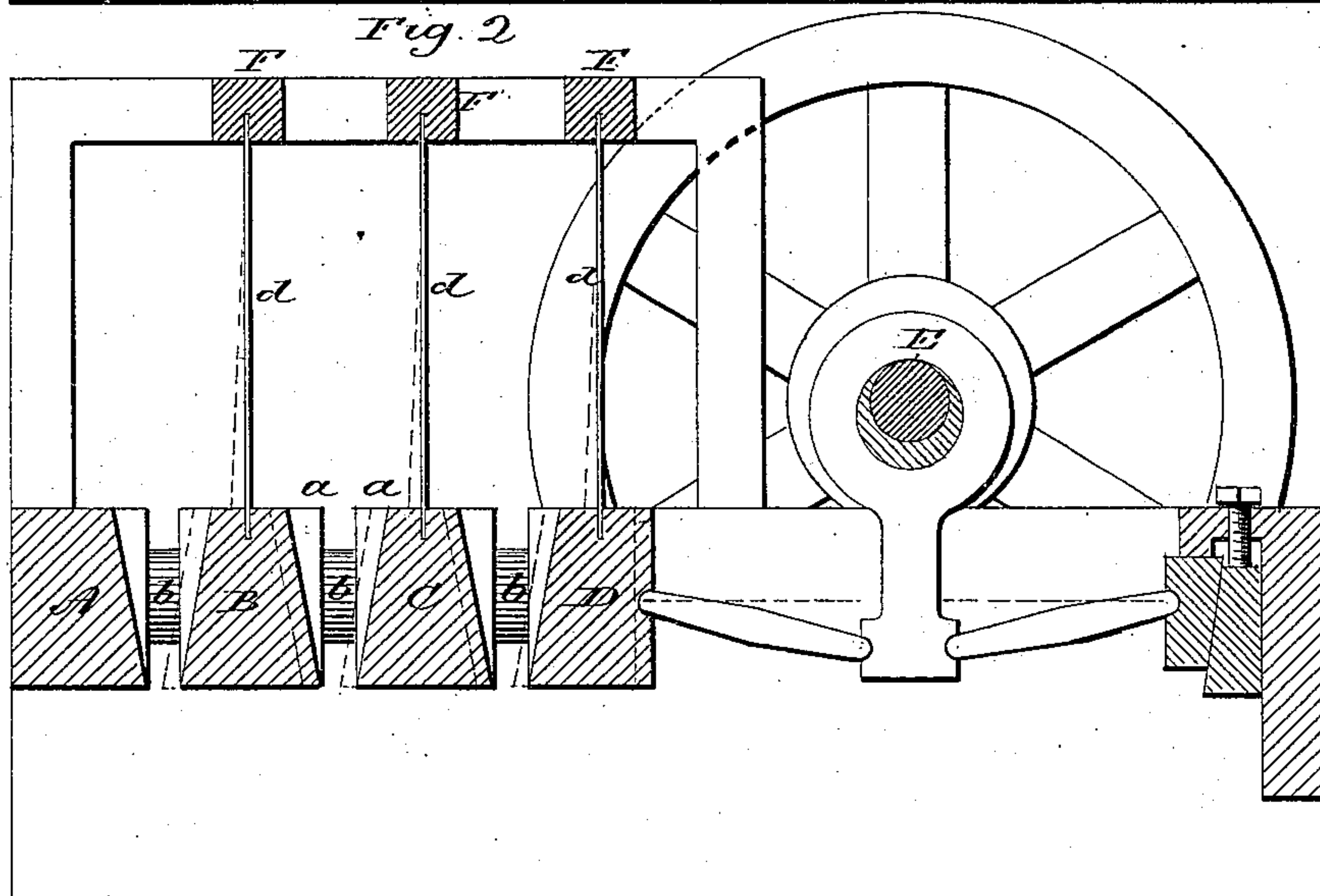


Fig. 3

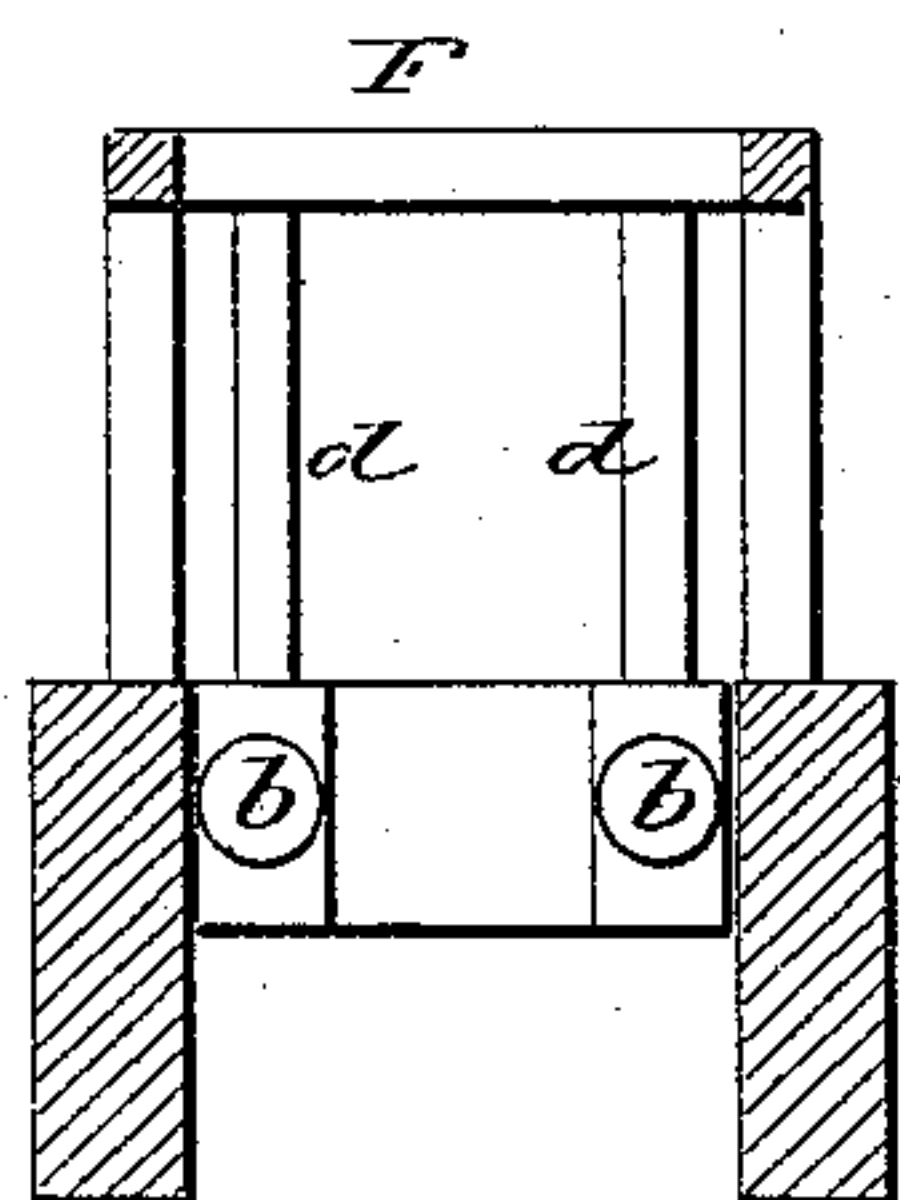


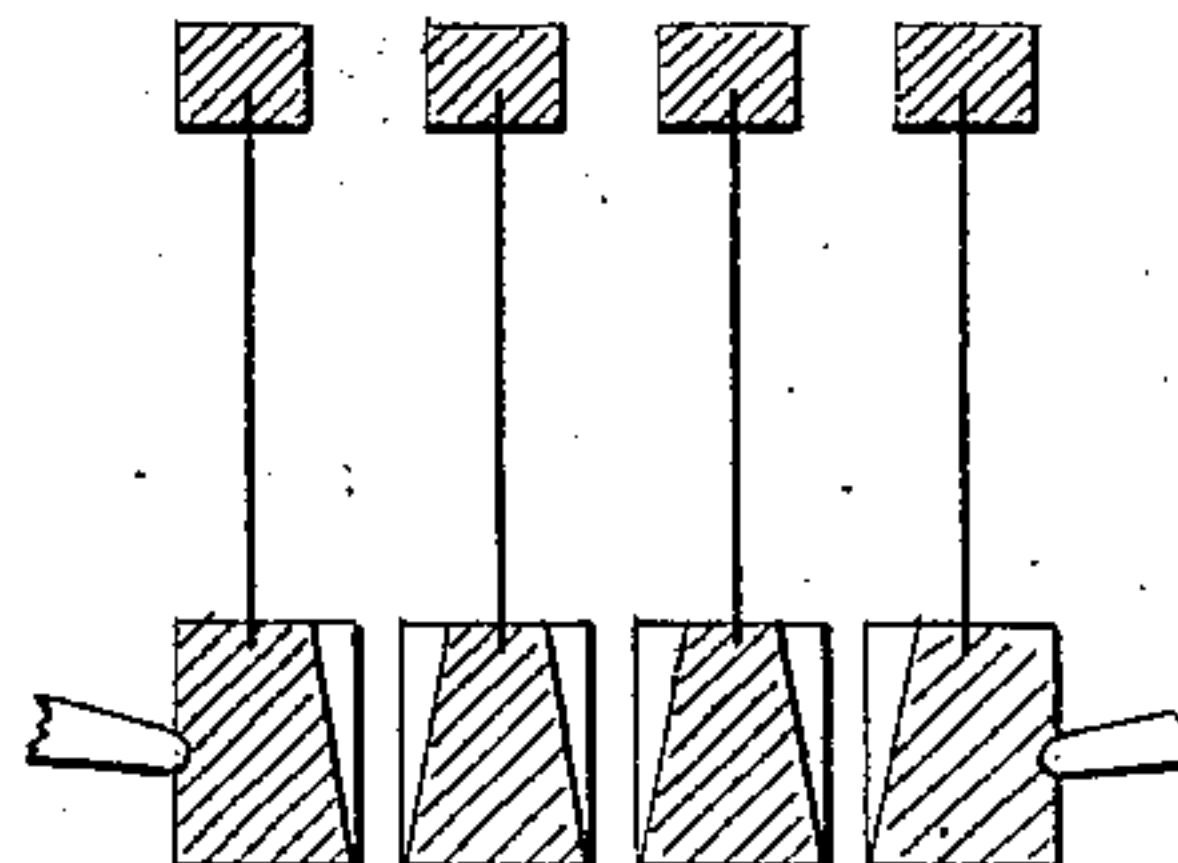
Fig. 4



Fig. 6



Fig. 5



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THEODORE A. BLAKE, OF NEW HAVEN, CONNECTICUT.

STONE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 308,234, dated November 18, 1884.

Application filed April 5, 1884. (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
5 Improvement in Stone-Crushers; and I do hereby declare the following, when taken in connection with accompanying drawings, and the letters of reference marked thereon, to be a full, clear, and exact description of the same,
10 and which said drawings constitute part of this specification, and represent, in—

Figure 1, a top or plan view; in Fig. 2, a longitudinal section; in Fig. 3, a transverse section; in Fig. 4, a modification showing the
15 jaws supported by vertical rods from below; in Fig. 5, a modification showing the power applied at both ends of the series, all the jaws movable; and in Fig. 6, a modification of the yielding supporting-rods.

20 This invention relates to an improvement in that class of stone or ore crushers in which several jaws are arranged in a series, the faces of the respective jaws being convergent, and the power applied to one or both ends of the
25 series, whereby the several jaws are forced toward each other, the material being crushed between the several jaws, and being a medium for communicating the movement given at the end of the series to the intermediate jaws, and
30 by which movement the material between all the jaws is crushed in substantially the manner of the well-known "Blake Crusher," and is an improvement on the machine for which Letters Patent were granted to me April 25, 1882,
35 No. 256,959, which class of machines are now known as "multiple-jaw crushers."

In my patent before referred to the jaws are hung upon pivots at their upper edges in like manner as the movable jaw is hung in the well-
40 known "Blake Crusher." The power is applied at one end of the series of jaws, that jaw approaching the next or second in the series, and the second approaching the third, and so on, the vibratory movement opening and closing
45 the jaws, the jaws turning as on a pivot.

In the jaws hung as in my previous patent, so as to vibrate from a center near the bed of the machine, the greatest extent of movement is at the lower end of the jaw, gradually di-
50 minishing toward the top, at the top there being substantially no movement; hence the

greatest amount of crushing must be done at the lower edge.

The object of my present invention is to suspend the jaws, but yet cause them to move to
55 substantially the same extent at the top as at the bottom or delivery; and the invention consists in suspending the jaws by a yielding device, whereby they may receive substantially a reciprocating movement instead of a vibra-
60 tory movement, as more fully hereinafter described.

In Figs. 1 and 2 I show a series of four jaws, A B C D, arranged parallel to each other, their
65 adjacent faces inclined upward and from each other, so as to make the opening divergent from the lower edges upward. The one jaw, A, at the end of the series is fixed to the bed, the other jaws, B C D, being movable. Power
70 is applied to the other extreme jaw, D, by means of a toggle operated from an eccentric on the driving-shaft E, in the usual manner of operating the movable jaw in stone-crushers, and as in my previous patent.

The recess between the jaws that forms their
75 inclined faces or working-mouth is less than the length of the jaws, so as to leave a projection, *a*, on the face of each jaw. The adjacent faces of these projections *a* are parallel to each other, as seen in Fig. 2, and between
80 those projections india-rubber or other suitable springs, *b*, are placed. Each of the movable jaws is suspended from above by yielding or elastic rods *d*. The ends of these rods, as
85 shown in Fig. 2, are made fast to the respective jaws, and the other ends made fast to a bar, F, above, these bars being supported from the bed, as seen in Fig. 3. Preferably each jaw is
90 provided with two or more of the rods *d*, and they are best made from flat steel or other elastic or flexible material, so as to hold the several jaws in their proper horizontal plane.

When the power is applied, the movement of the toggle imparts a forward-and-backward
95 movement to the jaw D, which is communicated to the next jaw, C, through the material, which may be placed between, and through the jaw C, in like manner, to the jaw B, the fixed jaw A being the resistance, the several
100 jaws being forced toward that fixed jaw and toward each other, and crushing the material between them, as in my previous patent.

The spring or yielding rods *d*, by which the jaws are suspended, permit them to move toward each other, and still retain substantially their same inclination to each other, as indicated in broken lines, Fig. 2, whereas, hung to vibrate as in my previous patent, the inclination of the face of one jaw with relation to the next varies throughout its entire movement—that is, the jaws thus suspended move substantially as if they were guided in a horizontal path.

It will be understood that the material is placed between the jaws in the usual manner, as in my previous machine.

Instead of suspending the jaws by the flexible or elastic rods, they may be supported upon those rods from below, as seen in Fig. 4, with substantially the same result.

Instead of making the rods rigid in their attachment to the jaws, they may be hinged to the jaw and at their other end, as seen in Fig.

6, the hinges permitting substantially the same movement of the jaws as when rigidly attached.

Instead of having one fixed jaw, all may be movable, as seen in Fig. 5, the power being applied to the jaw at each extreme, the operation being to force the extreme jaws toward each other and correspondingly move the intermediate jaws.

I claim—

The combination of a series of movable crushing-jaws, mechanism, substantially such as described, to impart a movement to said jaws toward and from each other, and yielding rods, the said movable jaws being supported by said yielding rods at substantially right angles to the path of movement of the jaws, substantially as specified.

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Witnesses:

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