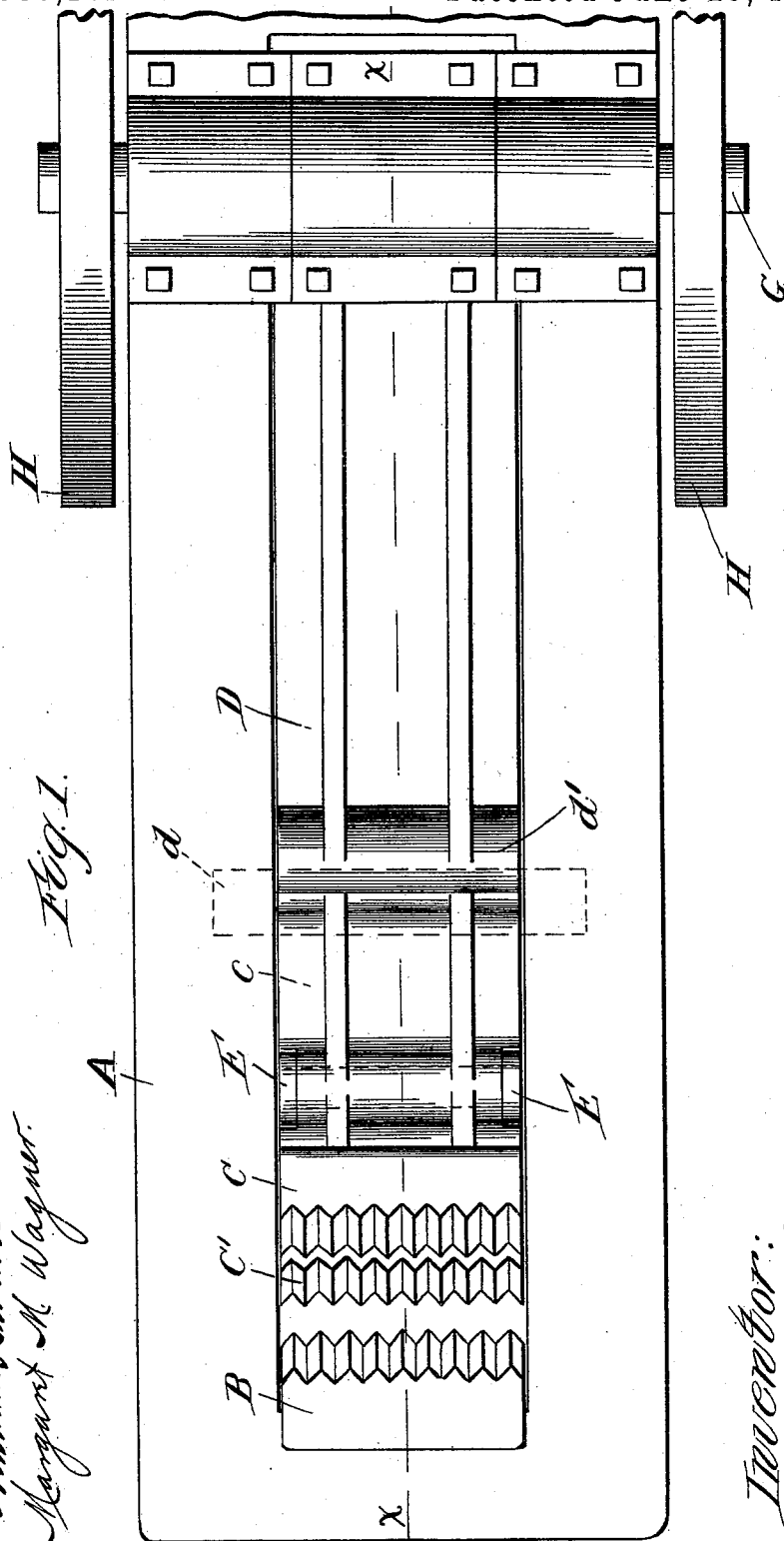


M. G. BUNNELL.
CRUSHING MACHINE.

No. 585,182.

Patented June 29, 1897.



Witnesses:

Arthur F. Sumner.
Margaret M. Wagner.

Fig. 1.

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By *Chas. G. Page. Atty.*

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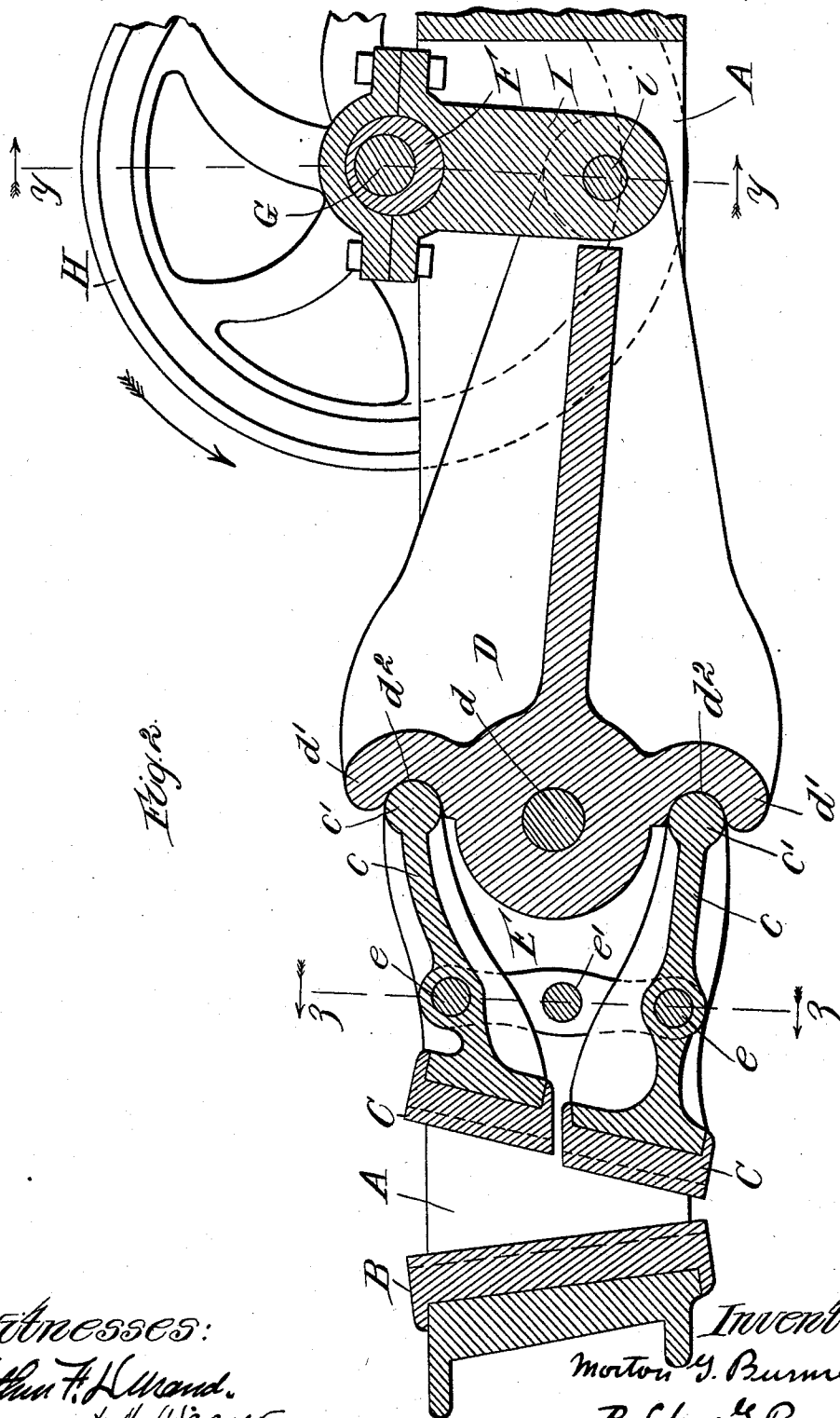


Fig. 2.

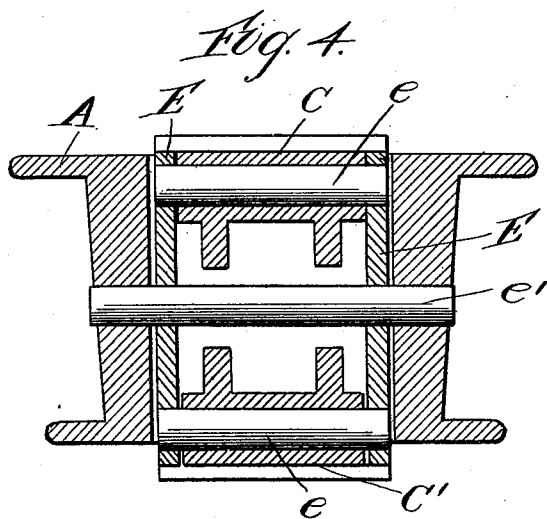
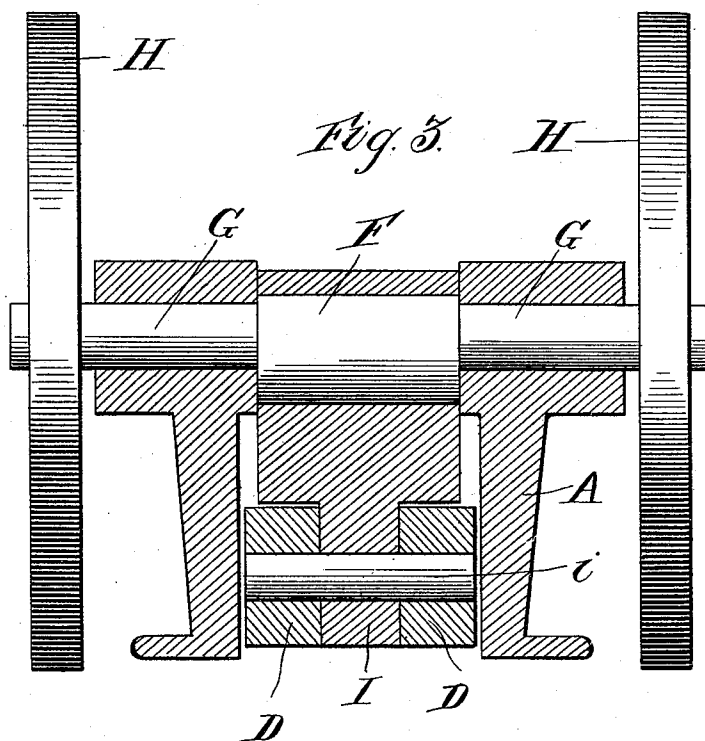
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UNITED STATES PATENT OFFICE.

MORTON G. BUNNELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO FREDERICK C. AUSTIN, OF SAME PLACE.

CRUSHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 585,182, dated June 29, 1897.

Application filed October 7, 1895. Serial No. 564,834. (No model.)

To all whom it may concern:

Be it known that I, MORTON G. BUNNELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Crushing-Machines, of which the following is a specification.

Prominent objects of my invention are to provide an exceedingly simple, powerful, and rapidly-effective crushing-machine in which the stone or like material on its way downwardly through the crushing-hopper shall be subjected to and crushed by a rapid succession of hammer-like blows, tending to crush it in what is known as "cube" form.

To the attainment of the foregoing and other useful ends my improved machine comprises a crushing-hopper having at one side a couple of reciprocating crushing-jaws operating in relatively reverse directions and connected with one another and controlled by a pivotally-supported vibratory connection and operated by a vibrator which serves to thrust the jaws forward in alternation. The back movement of one jaw is enforced by the forward movement of the other jaw as a result of the vibratory connection between the two. This vibratory connection is pivoted at a point between its connections with the jaws, whereby the jaws are guided and caused to have uniform relative movements in opposite directions. One jaw is arranged over the other, and hence the material while passing downwardly through the hopper will be subjected to a rapid succession of hammer-blows.

In the accompanying drawings, Figure 1 is a top plan view of the greater portion of a crushing-machine embodying my invention. Fig. 2 is a longitudinal section on line *x x* in Fig. 1. Fig. 3 is a section on line *y y* in Fig. 2, the balance-wheels being in elevation. Fig. 4 is a section on line *z z* in Fig. 2.

The main frame A of the machine may be of any suitable construction, and the stationary jaw B can be either permanently fixed or arranged for adjustment in any ordinary or suitable way. The movable crushing means comprises a couple of independently-movable jaws C and C', arranged one over the other and operated by a vibrator D, which is pivoted at *d*. The vibrator D is in the nature

of a vibratory lever whereof its portions *d'* *d'* constitute the arms with which the arms or rear extensions *c c* of the jaws are connected. As a simple and desirable way of connecting the arms or extensions of the jaws with the lever the latter is provided with rounded sockets *d²*, and the arms or extensions *c* are provided with rounded bearing ends C', which engage in said sockets, the practical result being hinge or pivotal connections between the jaws and vibrator, it being also obvious that the converse of such jointed connections between the jaws and vibrator could be employed—that is to say, the vibrator could have rounded or analogous bearing portions engaging in sockets in the rear extensions of the jaws.

The rear portions or extensions of the jaws are respectively pivoted, as at *e e*, to the opposite end portions of a vibratory or swinging link or bar E, which forms a vibratory lever connection between the jaws and which is pivoted at a point between its connections with the jaws, as at *e'*. The vibrator D can be actuated by any suitable means, a simple construction of operating device being an eccentric F, arranged upon shaft G, which carries the balance-wheels H, and serving to operate a pitman I, which is pivotally connected, as at *i*, with the rear end portion of the vibrator, which latter extends back to some extent from the point at which it is pivotally supported or fulcrumed between the sides of the main frame.

The operation of the vibrator causes the jaws to reciprocate in relatively reverse directions, it being observed that when one jaw is thrust forward by the action of the vibrator the other jaw is drawn rearwardly by reason of the vibratory connection between the two jaws. The material between the stationary jaw and the movable crushing-jaws will be crushed by a succession of crushing impacts having the effect of hammer-blows and will be crushed in what is commonly termed "cube" form. The actions of the movable crushing-jaws will also be practically direct, owing to the fact that the arcs described by the ends of the vibratory connection E, which maintains the jaws apart, will be slight.

What I claim as my invention is—

1. A crusher having a crushing-hopper com-

prising upper and lower reciprocating jaws;
a pivotally-supported swinging link pivotally
connected to the jaws at points which are
situated to the rear of the crushing-faces of
the latter and on opposite sides of the point
of support of the link; and means for reciprocating the jaws in alternation, and for vibrating the same about their points of connection with the link during reciprocation, as set forth.

2. In a crushing-machine, the combination,
with the upper and lower reciprocating jaws,
of a pivotally-supported swinging link pivotally connected with the jaws at opposite
sides of its point of support, whereby the link
serves as a support for the jaws and also in-

sures their reciprocation in alternation as set forth.

3. A crushing-machine having a crushing-hopper comprising upper and lower movable jaws; a pivotally-supported swinging link to which the jaws are pivotally connected at points on opposite sides of the pivotal support; a vibrator having a jointed connection at one end with the crushing-jaws; and a pitman connected with the opposite end of the vibrator, substantially as described.

MORTON G. BUNNELL.

Witnesses:

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MARGARET M. WAGNER.