

H. W. COLVER.
Stamping-Mill.

No. 159,303.

Patented Feb. 2, 1875.

Fig. 1.

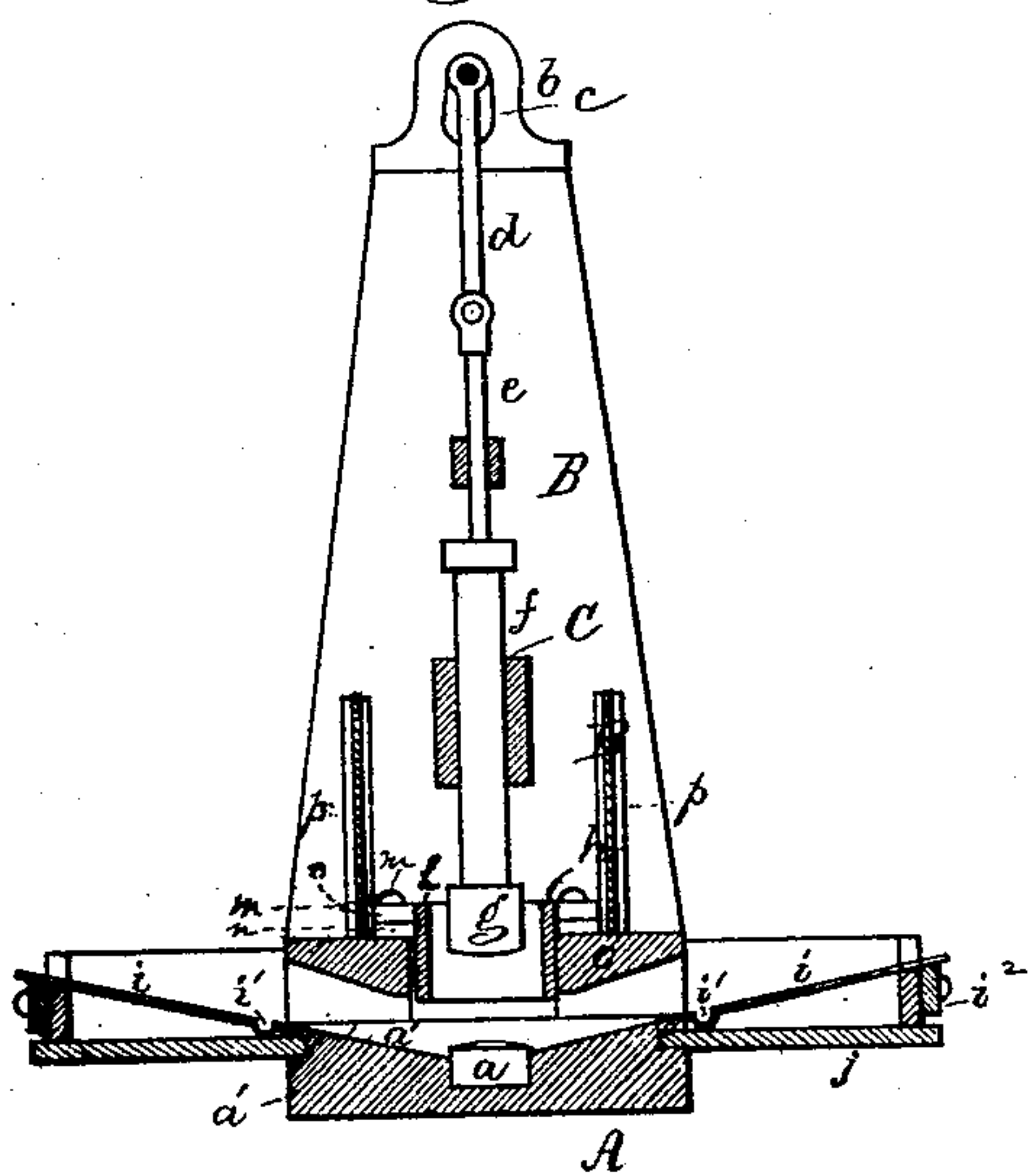


Fig. 2.

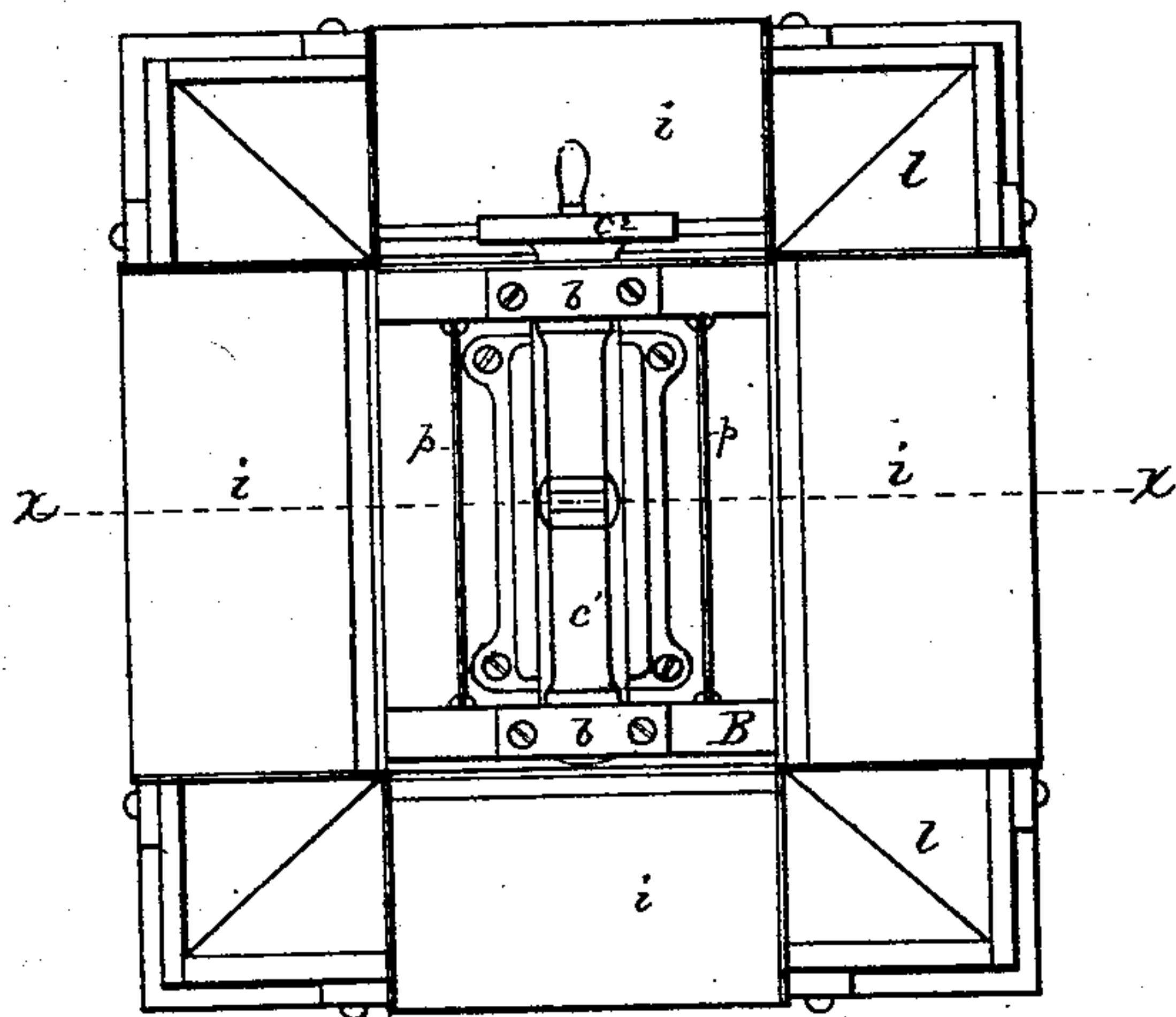
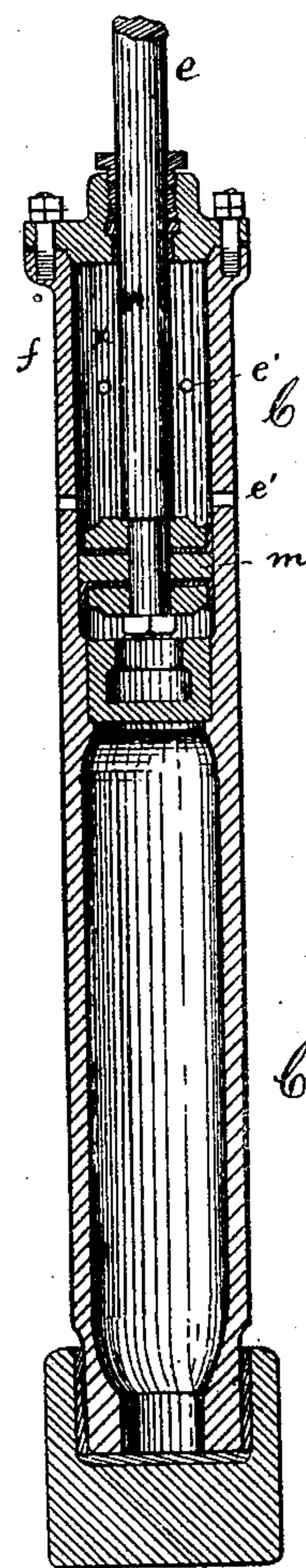


Fig. 3.



WITNESSES.

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HIRAM W. COLVER, OF WAUKESHA, WISCONSIN.

IMPROVEMENT IN STAMPING-MILLS.

Specification forming part of Letters Patent No. 159,303, dated February 2, 1875; application filed December 9, 1874.

To all whom it may concern:

Be it known that I, HIRAM W. COLVER, of Waukesha, in the county of Waukesha, in the State of Wisconsin, have invented Improvements in Mills for Crushing Ores, of which the following is a specification:

My invention relates to improvements in mills for crushing ore, and known as "stamp-mills;" and my invention consists in the combination, with a battery of stamps, of a movable or adjustable ore-holding box, and also in the combination, with a stamp-mill, of one or more plates extending about the base of the bed containing the stamps, and inclining inwardly toward the bed or fixed stamp-blocks, substantially as hereinafter described.

Figure 1 is a cross-section of my improved stamp-mill on line *x x*, Fig. 2. Fig. 2 is a top view, and Fig. 3 is a section, of one of the stamps.

The bed A of the stamp-mill is made of any suitable material having the requisite strength and firmness, and it supports the fixed stamp-blocks *a*, the face *a'* of the bed inclining toward these blocks, as shown in Fig. 1. Rising over the bed A is a frame, B, having at top, in suitable bearings *b*, a shaft, *c'*, driven by power, and having any desired number of cranks or eccentrics *c*, connected, by means of connecting-rods *d*, with the stamps C. Fig. 3 shows a section of a stamp. It is composed of a cylinder, *f*, having a chamber, *x*, to receive a piston, *m*, connected with a piston-rod, *e*, working through a stuffing-box at the top of the cylinder *f*. The cylinder *f* is provided with several small holes, *e'*, leading from the outer to the inner side of the chamber. The piston works air-tight within the chamber, and when moved by its operating-shaft acts to compress the air on its opposite sides, the air so compressed acting as a cushion to ease the force of the blow of the piston against the end pieces forming the chamber *x*, and in addition thereto the air so compressed, acting quickly and powerfully, gives an additional and accelerated impulse to the stamp, both in rising and falling, and adds to the efficiency and power of the stroke of the stamp.

The ore or material to be crushed is fed through a suitable hopper, or otherwise, into a strong metallic frame, *h*, shown as quadran-

gular, and supported on the sills *o*, just above the bed A. This frame is secured to the said sills by screws *m*, and may be adjusted vertically to or from the face or top *a'* of the bed by means of blocks or washers *n*, under the lugs *c*, projecting from the frame *h*, and this allows a free circulation of water and pulverized or broken ore or other substances between the bottom of the frame and the bed, and the opening between the frame and bed is graduated so as to be more or less, as circumstances render necessary. On the upper side of the sills *o*, and outside the frame *h*, I place vertical plates *p*, which act as guides or guards to retain the material under treatment. About the bed A I arrange a platform, *j*, preferably box-like, with adjustable side pieces *i*². Extending from the sides and ends of the bed A to the sides of the box or frame are plates *i*, preferably of copper, made trough-like, and having at their lower edges grooves *i*¹, to contain mercury. When the material to be stamped is placed in the box, and the stamps are operated, a stream of water is kept flowing into and through the mill, passing into the frame *h*, and freely under and between it and the bed, and then flowing up and over the inclined copper plates *i*, the heavier portions of the material, or that of greatest specific gravity, having a tendency to return to the lowest portion of the bed, and passing over the plates and the grooves or channels *i*¹, containing mercury.

The ore can be discharged at a uniform degree of fineness, and can be retained, if necessary, until it becomes thin and fine, and readily flows with water, and the ore is kept in the inclosure about the bottom of the bed as long as desired, or until it is broken or ground to the necessary degree, this being controlled by raising or lowering the outer ends of the copper plates *i*, by means of the adjustable side plates *i*², held by screws or by any other suitable adjusting devices.

The plates *i* might be arranged to completely surround the bed A, instead of being placed at four sides, and leaving corners *l* without plates, as shown. The surface of the bed A might be inclined more or less than shown, and my adjustable copper or amalgam plate or plates *i* may be used with any kind of a stamp-mill.

I am aware that copper plates inclining outward and downward from a bed of a stamp-mill are not new; but by placing the plates as I have placed them I gain very important advantages. In the old way the material flowing from the bed passes but once over the plates; but by arranging the plates to incline inwardly the material keeps in circulation over the plates, rising toward the higher portions of the plates and then returning, and in this way the material passes and repasses over the mercury in the grooves *i*¹ in the plates *i*, and the loss of valuable metals is very slight.

Having described my invention, I claim—

1. The combination, with the bed and stamp-blocks, of an ore-receiving box, supported above the face of the bed, leaving a space between such frame and bed, as and for the purpose set forth.

2. The combination, with a bed and stamp-blocks, of the inclined and grooved plates *i*, arranged and operating in connection with such bed, substantially as and for the purpose set forth.

3. In combination, the stamp, constructed as described, the bed, the frame *h* supported above the bed, and the adjustable plates *i*, as and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HIRAM W. COLVER.

Witnesses:

CHARLES CARR,
G. W. GREGORY.