

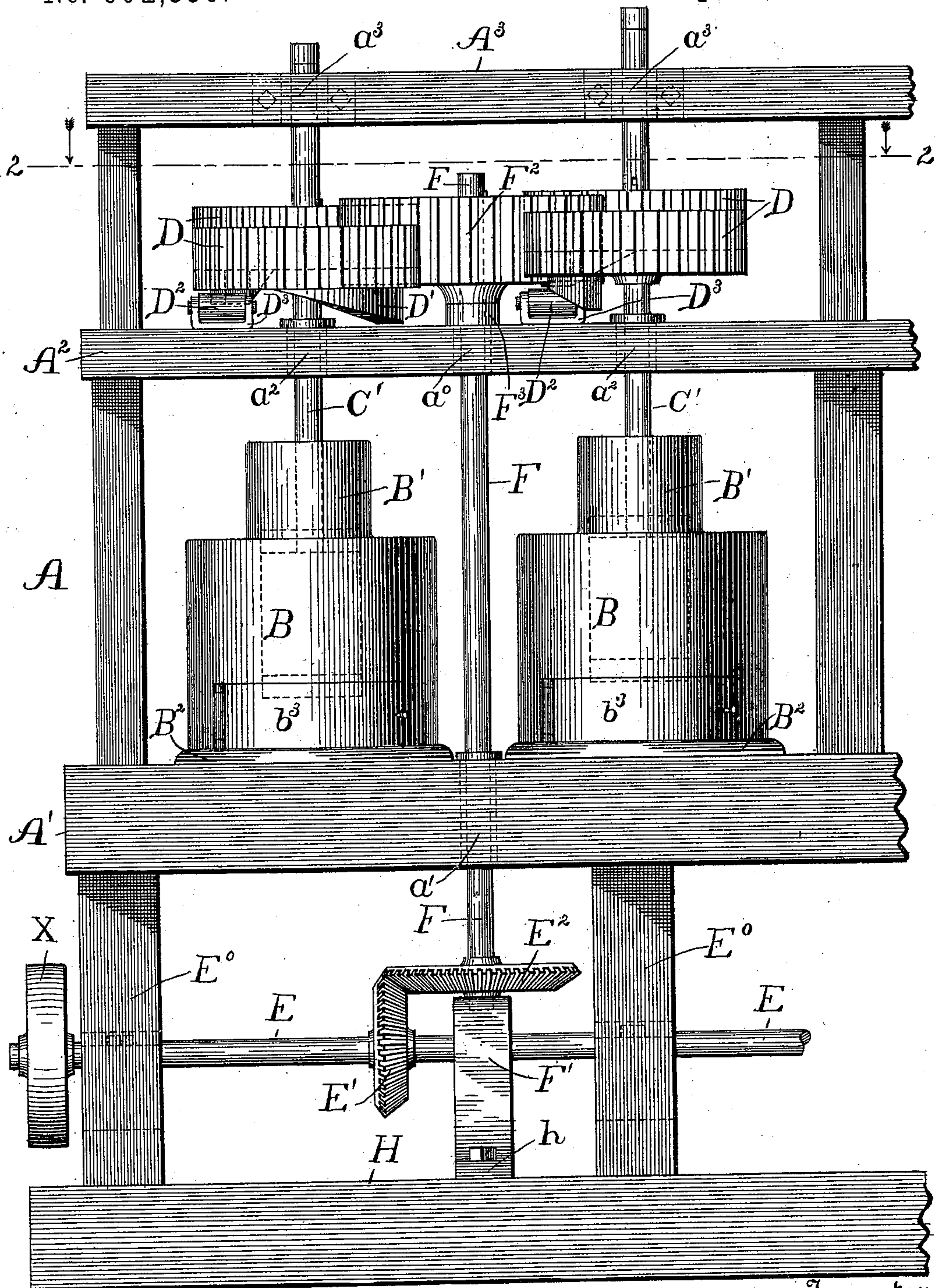
(No. Model.)

2 Sheets—Sheet 1.

E. F. PARKER.  
ORE STAMPING AND CRUSHING MILL.

No. 602,356.

Patented Apr. 12, 1898.



Witnesses  
D. H. Blakelock.  
John L. Wilson.

FIG. 1.

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(No Model.)

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FIG. 2.

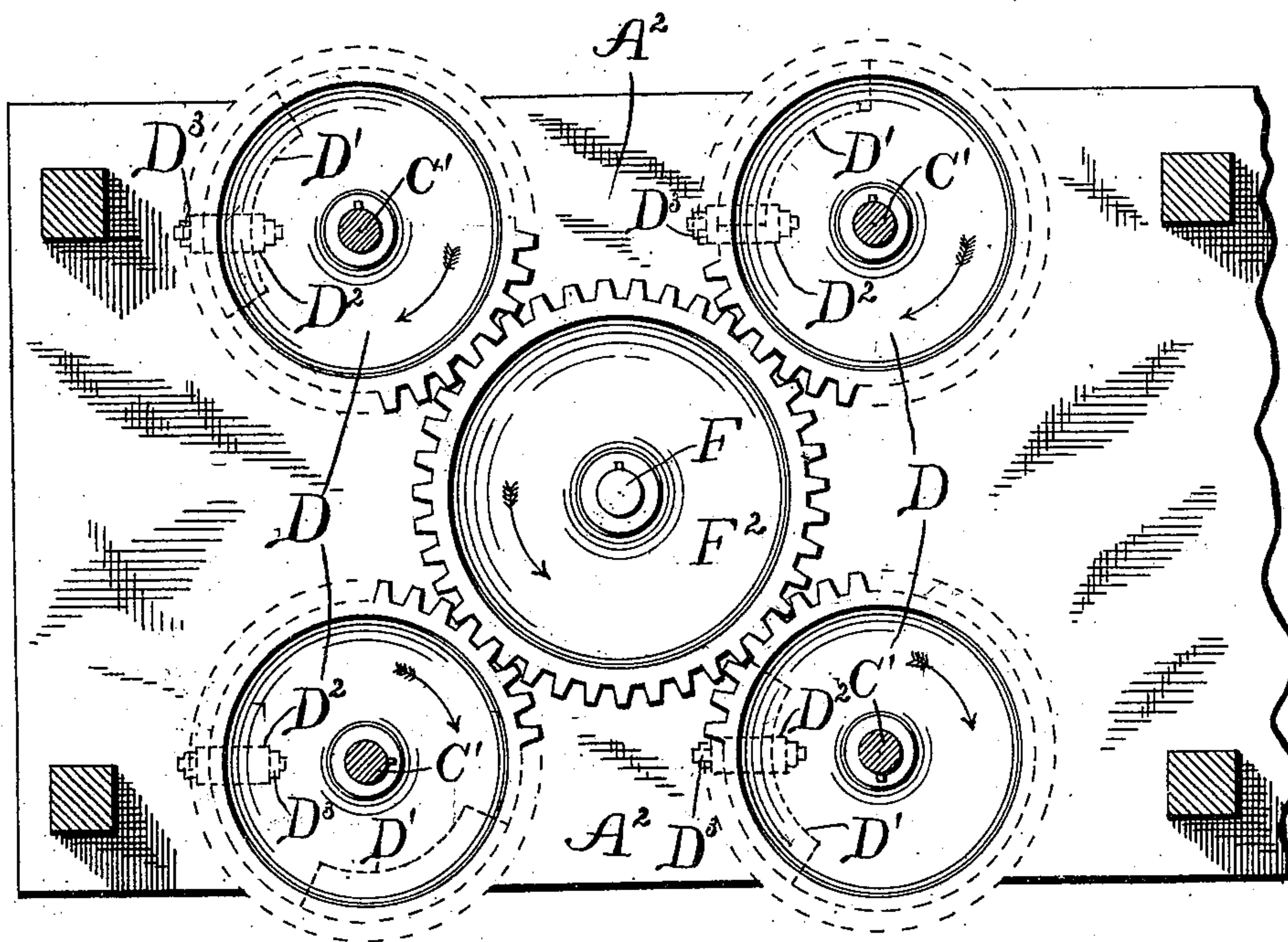
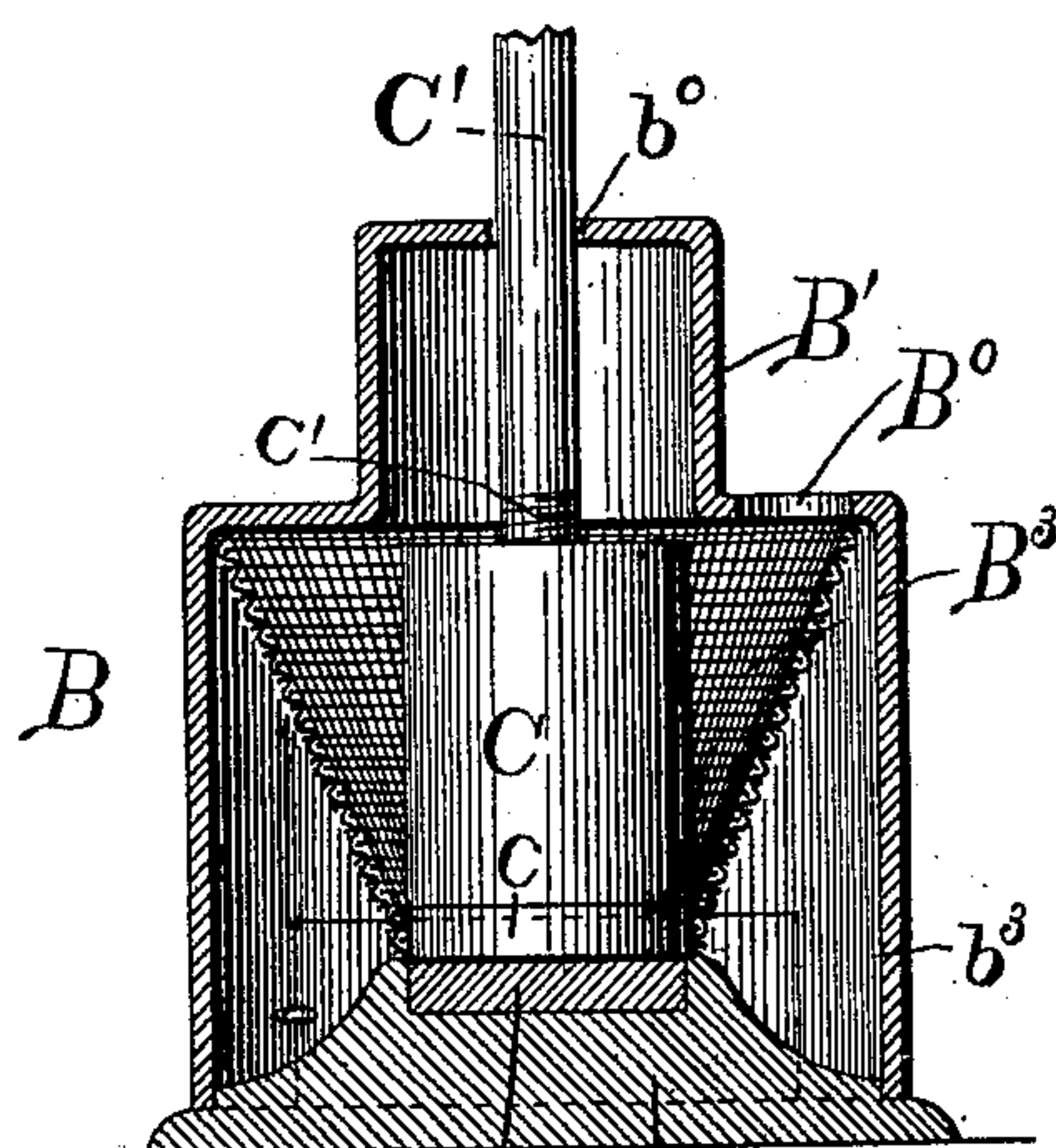
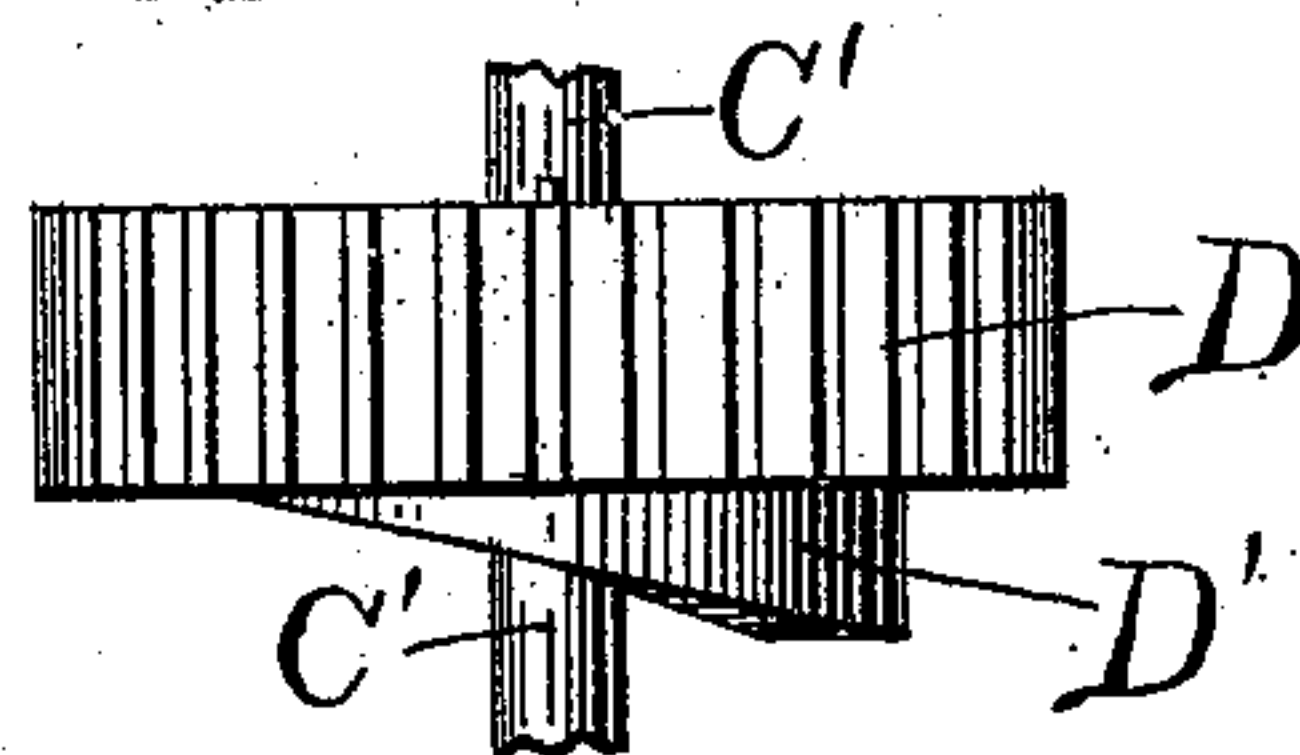


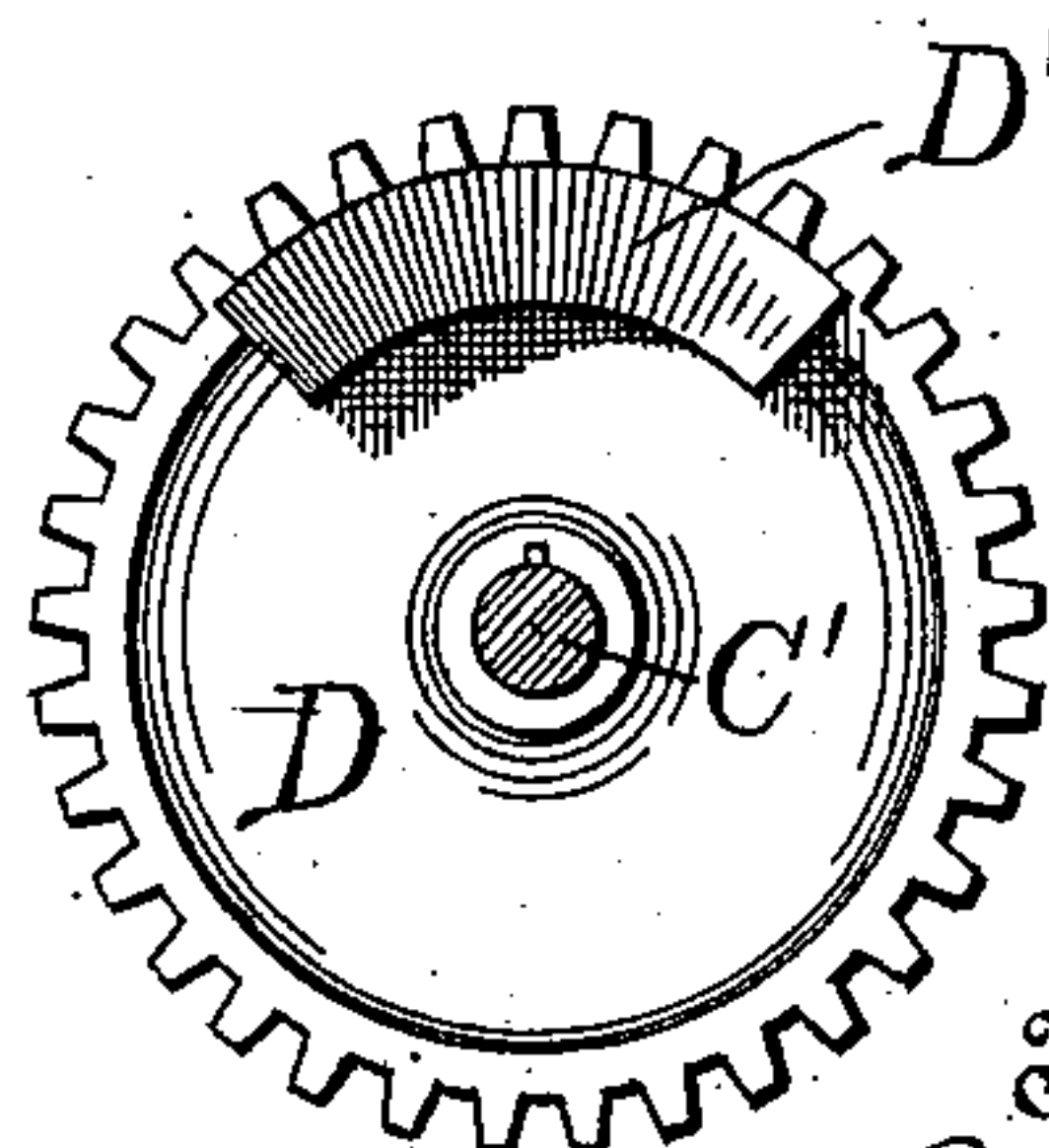
Fig. 3.



Witnesses b<sup>2</sup> B  
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# Fig. 5.



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# UNITED STATES PATENT OFFICE.

EDWARD F. PARKER, OF DENVER, COLORADO.

## ORE STAMPING AND CRUSHING MILL.

SPECIFICATION forming part of Letters Patent No. 602,356, dated April 12, 1898.

Application filed September 24, 1897. Serial No. 652,894. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD F. PARKER, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Ore Stamping and Crushing Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in apparatus for stamping and crushing ore; and it consists in the new features and combinations hereinafter described and claimed.

My invention will be understood by reference to the accompanying drawings, wherein the same parts are indicated by the same letters throughout the several views.

Figure 1 is a side elevation of a cluster or battery of ore stamping and crushing devices constructed in accordance with my present invention. Fig. 2 is a horizontal section taken on the line 2 2 of Fig. 1 and looking down. Fig. 3 is a detail central vertical section through one of the shells, showing the interior thereof. Fig. 4 is a detail side elevation of one of the cog-wheels through which the stamps are operated, the cam thereon and a portion of the plunger-shaft being shown. Fig. 5 is a bottom plan view of the wheel and the parts connected thereto shown in Fig. 4.

A represents a frame of suitable construction having heavy longitudinal timbers  $A^1$  and  $A^2$  and suitable longitudinal timbers  $A^3$  for guiding the upper ends of the plunger-shaft, all supported upon uprights  $E^0$ , mounted upon base-timbers or sills H.

E represents a horizontal shaft suitably journaled in the said frame and having a pulley X fixed thereon for driving the said shaft from any suitable source of power. A bevel-gear  $E^1$  is also fixed upon said shaft and meshes with another bevel-gear  $E^2$ , fixed upon a vertical shaft F, which latter shaft is journaled, as at  $a^1$  and  $a^0$ , in journal-boxes mounted in the timbers  $A^1$  and  $A^2$ , respectively, and rests at its lower end in a bearing-block  $F^1$ , bolted or otherwise suitably secured, as at  $h$ , upon the sill H. A wide cog-wheel  $F^2$  is fixed upon the upper end of the shaft F and rests upon a collar  $F^3$ , mounted upon the

timber  $A^2$ . The vertical shaft F and the cog-wheel  $F^2$ , mounted thereon, are rotated from the horizontal shaft E through the bevel-gears  $E^1$  and  $E^2$ , above referred to, the pulley X being driven from any suitable source of power.

B represents the crushing-shell, which is of a cylindrical form and provided at its top with a reduced cylindrical portion  $B^1$ , having a central upper opening  $b^0$ , in which the vertical shaft  $C'$  of the stamping-plunger is adapted to work. This shell B rests upon a solid base  $B^2$ , having a recess in its upper face, into which is fitted a die  $b^2$ . This base portion  $B^2$  should preferably be made of cast-iron on account of cheapness, and the die  $b^2$  should be made of chilled iron, preferably, in order that it may withstand the blows of the plunger.

A wire-netting  $B^3$  of sufficient strength and of the desired fineness of mesh is fitted within the shell B, preferably in a funnel shape, as shown in Fig. 3, its upper edge flaring sufficiently to allow the ore to be introduced within this wire-netting through the opening  $B^0$  in the shell, this opening being so located in the shell as to permit the ore to be introduced without its falling upon the upper end of the plunger-head. The lower edge of the wire-netting  $B^3$  extends around the periphery of the die and allows simply enough room for the operation of the plunger. As the ore is stamped and crushed by the plunger it will be gradually forced outward through the wire mesh into the shell B as it reaches the requisite degree of fineness.

C represents the head of the plunger, which is preferably cylindrical in form, as shown, and solid, and has mounted upon its lower end a shoe  $c$ , preferably of chilled iron. The head C of the plunger itself should preferably be of cast-iron.

$C'$  represents the plunger-shaft, which is provided with screw-threads  $c'$  at its lower end, which engage in a screw-threaded socket in the upper face of the plunger-head C. This plunger-shaft  $C'$  extends upwardly through the central opening  $b^0$  in the upper reduced portion of the shell, as above described, and further extends upwardly through the journal-box  $a^2$  in the timber  $A^2$  and also through the journal-box  $a^3$ , mounted upon the upper timber  $A^3$ . A cog-wheel D is fixed



upon the shaft C' just above the timber A<sup>2</sup> and is provided upon its under face with a cam D', which is rigidly fixed thereto. A roller D<sup>2</sup>, mounted in a suitable bracket D<sup>3</sup>, is fixed upon the sill A<sup>2</sup> beneath the cog-wheel D in such a position that when the said wheel is rotated in the proper direction cam D' thereon will run upon the roller D<sup>2</sup> as the cog-wheel rotates and will drop down upon passing over the said roller, thus giving to the shaft C' and the plunger-head C a continuous rotary and an intermittent vertical movement. The wheel D meshes with the wheel F<sup>2</sup>, by which it is driven, and is somewhat narrower in width than the said wheel F<sup>2</sup>.

While I have described but one set of stamping devices as operated by the cog-wheel F<sup>2</sup>, it is my purpose to have several of these stamping devices, preferably four, operated by the central wheel F<sup>2</sup>, as shown in Figs. 1 and 2, and as each of these devices is exactly similar to all the others the description of one will suffice for all. As shown in the said Figs. 1 and 2, these four stamping devices are grouped around the central shaft F and cog-wheel F<sup>2</sup>, the four cog-wheels D and their shafts C' being simultaneously rotated by the cog-wheel F<sup>2</sup>. As each of the wheels D rotates the cam D' thereon will run upon the roller D<sup>2</sup> therebeneath, thus raising the wheel, which will drop by the weight of itself and its connections as soon as the thicker end of the cam has passed over the roller. Thus for every rotation of the wheel D the plunger will be caused to rise and fall once, and the rapidity with which this beating is effected may be regulated by the rapidity of rotation of the main wheel F<sup>2</sup>, as will be obvious.

Any convenient number of clusters or batteries of stamps mounted in the same frame may be operated from the one horizontal shaft E, which may be elongated sufficiently and provided at proper intervals with bevel-gears similar to the bevel-gear E'. (Shown in Fig. 1.)

The crushed ore may be discharged from the interior of the shells B through doors b<sup>3</sup>, as shown in Figs. 1 and 3, or in any other convenient manner.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In an ore-stamping mill, the combination with a suitable frame; a horizontal shaft journaled in said frame, and a pulley fixed thereon; a bevel-gear fixed on said shaft; a vertical shaft journaled in said frame; a bevel-gear fixed on said vertical shaft and meshing with the bevel-gear on said horizontal shaft; and a wide-faced cog-wheel also fixed upon said vertical shaft; of a plurality of vertical shafts journaled in said frame around said vertical shaft, and capable of vertical movement; cog-wheels fixed upon said vertically-movable shafts, and each having a cam on its under side; rollers mounted upon said frame beneath said cog-wheels and adapted to be

struck by said cams as the wheels rotate; a plurality of shells for holding the ore while being stamped mounted in said frame, and plunger-heads connected to said vertically-movable shafts mounted in said shells, substantially as described.

2. In an ore-stamping mill, the combination with a vertical shaft and means for rotating the same; a wide-faced cog-wheel fixed on said vertical shaft and having a rotation constantly in the same horizontal plane; of a plurality of shells grouped around said vertical shaft; plunger-heads mounted in said shells; vertical shafts having screw-threaded ends engaging in said plunger-heads and working through openings in said shells; cog-wheels mounted upon said vertical shafts and meshing with said wide-faced cog-wheel; rollers journaled in brackets mounted upon the frame of the mill beneath the cog-wheels on said plunger-shafts; and cams D' on the under side of said wheels adapted to slide over said rollers as said wheels rotate, and to impart to said plunger-shafts a vertical movement in addition to the rotary movement imparted by the said wide-faced cog-wheel, substantially as described.

3. In an ore-stamping mill, the combination with a horizontal shaft, and means for rotating the same; a bevel-gear on said shaft; a vertical shaft, a bevel-gear fixed on said vertical shaft and gearing with the bevel-gear on said horizontal shaft; the wide-faced cog-wheel F<sup>2</sup> fixed on said vertical shaft and adapted to rotate constantly in the same horizontal plane; a plurality of shells grouped around said vertical shaft; plunger-heads mounted in said shells; vertical shafts having screw-threaded ends engaging in said plunger-heads and working through openings in said shells; cog-wheels mounted upon said vertical shafts and meshing with the cog-wheel F<sup>2</sup>; rollers journaled in brackets mounted upon the frame of the mill beneath the cog-wheels upon said plunger-shafts; and cams D' on the under side of said wheels adapted to slide over said rollers as said wheels rotate, and to impart to said plunger-shafts a vertical movement in addition to the rotary movement imparted by the cog-wheel F<sup>2</sup>, substantially as described.

4. In an ore-stamping mill, the combination with a suitable frame; a horizontal shaft journaled in said frame, and a pulley fixed thereon; a bevel-gear fixed on said horizontal shaft; a vertical shaft also journaled in said frame; a bevel-gear fixed on said vertical shaft and meshing with the bevel-gear on said horizontal shaft; and a wide-faced cog-wheel F<sup>2</sup> rigidly mounted upon said vertical shaft; a plurality of hollow shells B each having reduced cylindrical upper portion B' with central opening b<sup>0</sup> therein, mounted upon a solid metallic base B<sup>2</sup> seated upon said frame; a die seated in a recess in the upper face of said base B<sup>2</sup>; a funnel-shaped wire-netting in each of said shells surrounding said die at its



lower edge and adapted to receive the un-  
crushed ore at its top through an opening in  
the larger portion of said shell; a solid plun-  
ger-head provided with a hardened shoe at its  
5 lower end mounted in each of said shells; a  
vertical shaft having a screw-threaded end  
engaging in each of said plunger-heads; a  
cog-wheel fixed upon each of said shafts  
and meshing with said cog-wheel F<sup>2</sup>; a roller  
10 journaled in a bracket mounted upon the  
frame beneath each of said cog-wheels; and

a cam on the under side of each of said cog-  
wheels adapted to slide over said rollers, and  
impart to said shafts a vertical movement,  
substantially as described.

In testimony whereof I affix my signature  
in presence of two witnesses.

EDWARD F. PARKER.

Witnesses:

CHARLES A. ROBERTS,  
A. B. PHILLIPS.