(No Model.) 2 Sheets—Sheet 1.

J. J. STUART.

ORE PULVERIZER.

No. 478,209. Patented July 5, 1892.

Fig. 1.

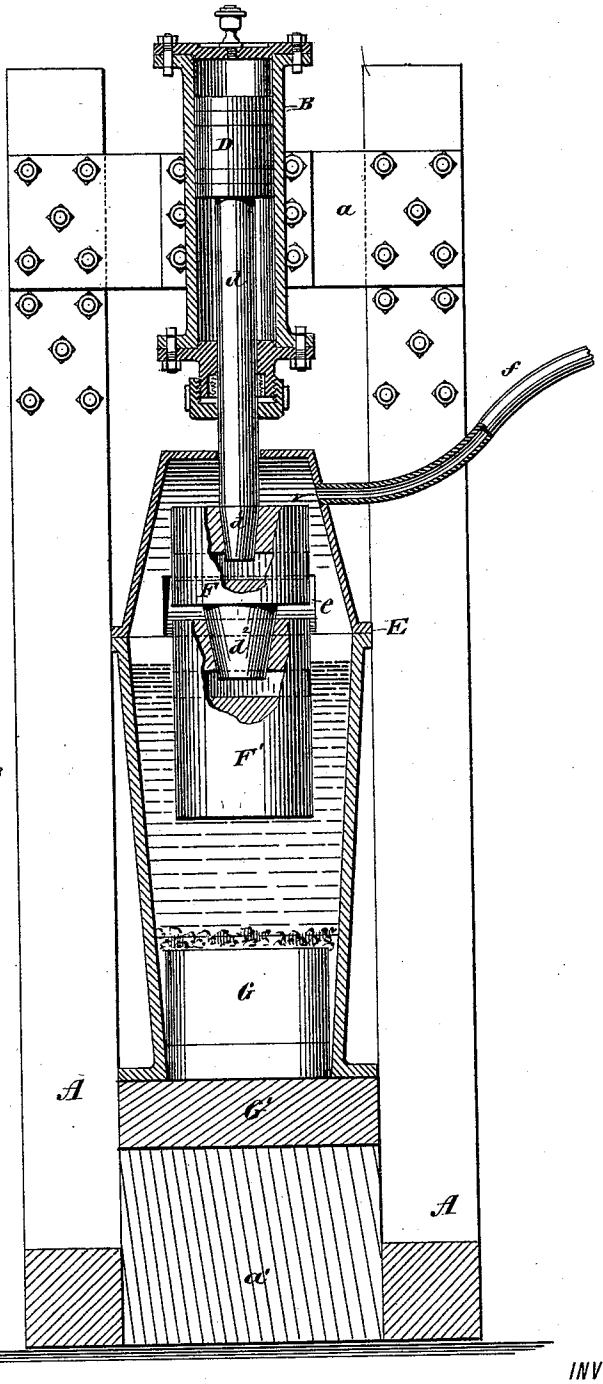


Fig. 4.

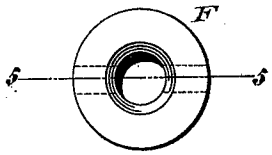
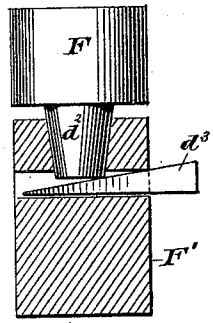


Fig. 5.



WITNESSES:

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his ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

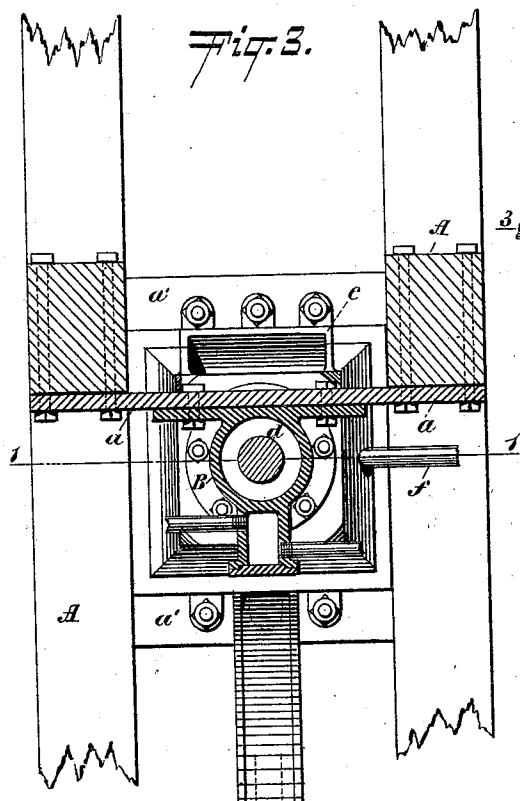
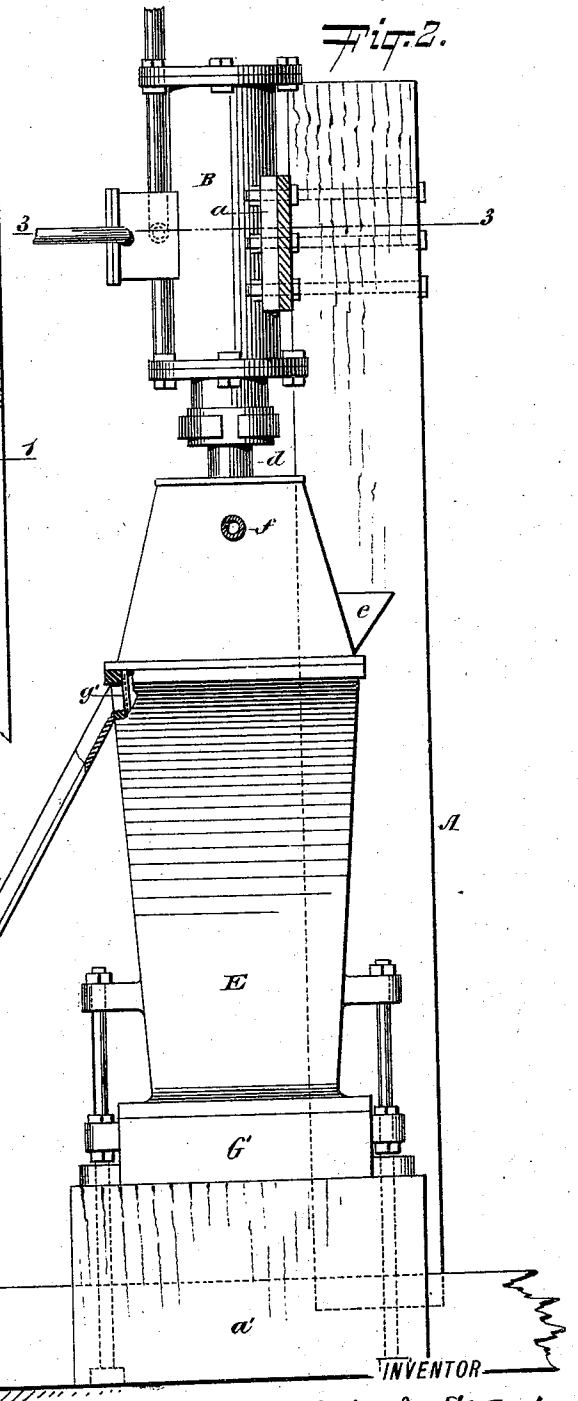


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN J. STUART, OF NEW YORK, N. Y.

ORE-PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 478,209, dated July 5, 1892.

Application filed October 28, 1891. Serial No. 410,071. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. STUART, a resident of the city, county, and State of New York, have invented a certain new and useful Improvement in Ore-Pulverizers, of which the following is a full, clear, and exact description.

My invention relates to a certain new and useful improvement in ore-pulverizers; and it consists in the novel arrangement of parts hereinafter described, whereby the ore is continuously triturated and pulverized in a closed vessel in the presence of flowing water and the powdered or pulverized ore is removed by said water to an appropriate receptacle.

It consists, also, in the combination of parts hereinafter more fully set forth and claimed.

In the drawings, Figure 1 is a vertical section on the line 1 1, Fig. 3, of the improved apparatus. Fig. 2 is a side elevation of the same. Fig. 3 is a cross-section on the line 3 3, Fig. 2. Fig. 4 is a plan; and Fig. 5 is a side elevation, partly sectional, illustrating a detail of construction of the triturating or pulverizing shoes.

To the upper cross-piece *a* of a suitable frame-work A is secured a steam chest and cylinder B. This steam-cylinder B is traversed by a suitable plunger or piston D and rod *d*. Immediately below this steam-cylinder B is placed a closed receptacle E, mounted upon the base *a'* of the frame-work A. This closed receptacle E is traversed by the rod *d* of the piston D and by one or more shoes F F', secured to said rod *d*. The closed receptacle E is provided near its upper end with a suitable chute or aperture *e*, through which the ore to be crushed is introduced, and a water-pipe *f*, through which a stream of water may be continuously passed into the receptacle. The bottom of the closed receptacle is by preference composed of steel or similar metallic block G, mounted on one or more layers of foundation G'. On one side of the receptacle E and below and by preference opposite the chute *e* is placed a trough *g*, fitted with a screen *g'* and leading from said receptacle E to a pit or cistern *h*. The method of securing the shoes F F' to the rod *d* or to the preceding shoe is shown in Figs. 1, 4, and 5. It consists in transversely channeling and vertically tapering the shoe and fitting the tapering end of the rod *d* or a projection d^2 on one of the shoes F into said taper, so that the tapered shaft *d'* of the rod or shoe extends to a distance below the upper edge of the transverse channel. To remove a shoe from the rod in this construction, a wedge d^3 is introduced into the transverse channel, as shown in Fig. 5. This construction renders the rod *d* and its shoes comparatively elastic, and the jar of the shoe upon the ore to be crushed is greatly avoided.

The operation of my apparatus is as follows: Ore is introduced into the closed receptacle E and falls upon the steel block G. Water from pipe *f* is also introduced to a height not exceeding the screened outlet *g'*. The piston D, its rod *d*, and the shoes F F' are moved vertically, crushing the ore upon said block G. The water circulating in the receptacle carries the finest particles of ore so crushed up to the surface of the water in the closed receptacle and through the screened outlet *g'* and along the trough *g* to the pit *h*. The heavy particles of ore remain at the bottom of the receptacle and are subjected to the triturating or crushing operation of the shoes upon said bottom until the ore has been sufficiently pulverized to be removed by the flowing water through the screen and trough to the pit. Fresh ore may be introduced into the receptacle at regular intervals, and the operation is practically continuous. If the lower actuating-shoe is worn out, it is easily replaced without disturbing the piston-rod.

Having now described my invention, what I claim is—

A continuous ore-pulverizer combining therein a stamping mechanism consisting of the piston, piston-rod, and removable shoes adapted to be dislodged therefrom by wedges introduced into transverse openings, a closed receptacle adapted to be partially filled with water, an ore-introducing chute above the surface of the water, an induction water-pipe leading into the top of and continuously flowing into the closed receptacle, and an outlet-pipe arranged on a level with and adapted to receive the water, together with the particles carried thereby, all arranged and operated substantially as described.

JOHN J. STUART.

Witnesses:
HARRY M. TURK,
HENRY E. EVERDING.