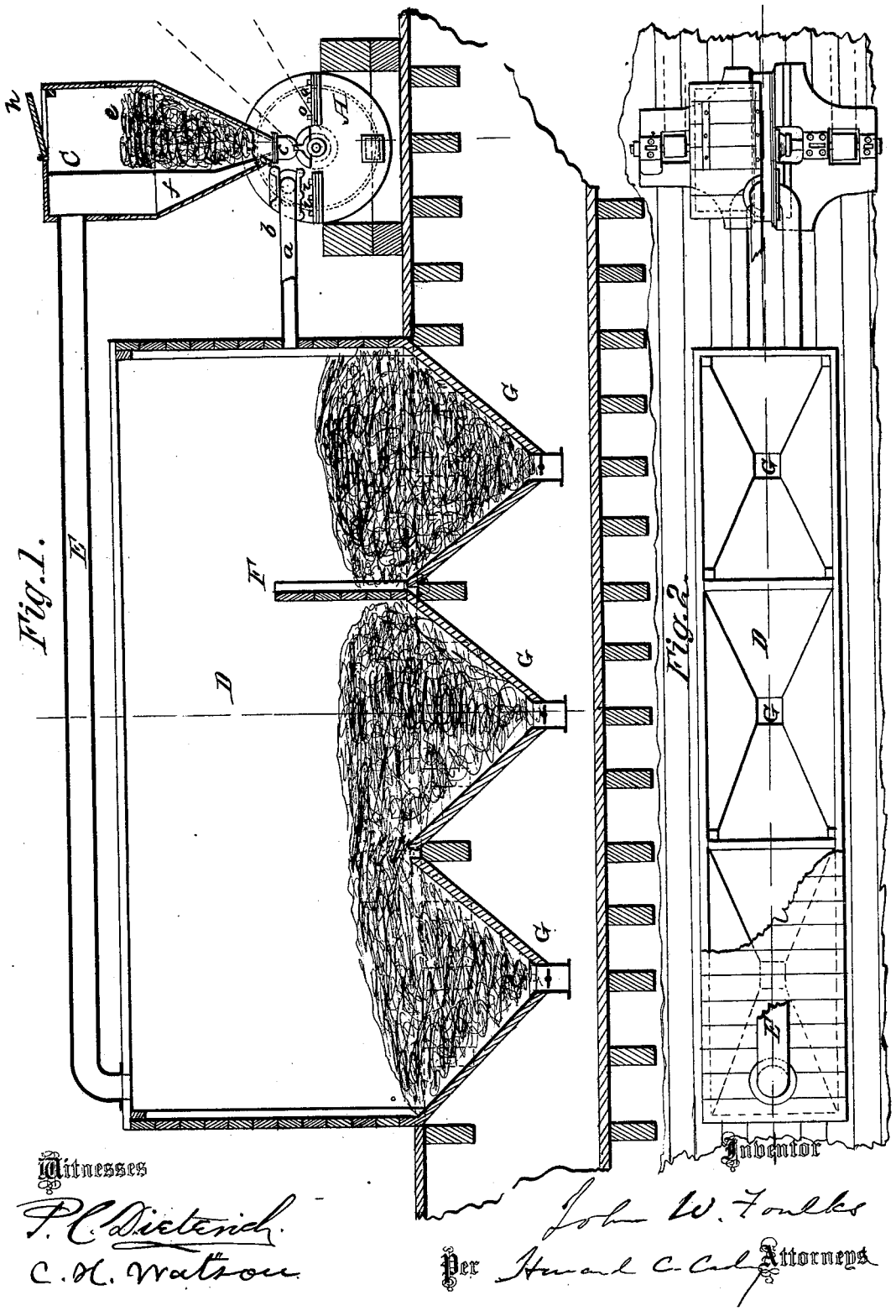
2 Sheets—Sheet 1.

J. W. FOULKS.

Ore-Mills.

No. 200,790. Patented Feb. 26, 1878.



2 Sheets—Sheet 2.

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Fig. 3.

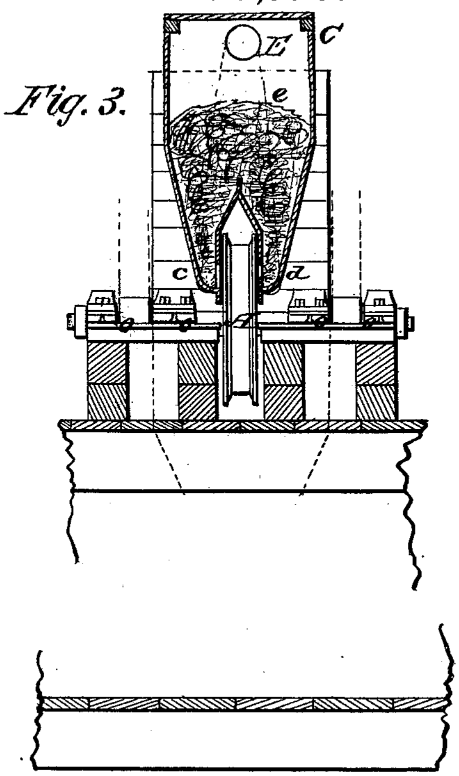


Fig. 4.

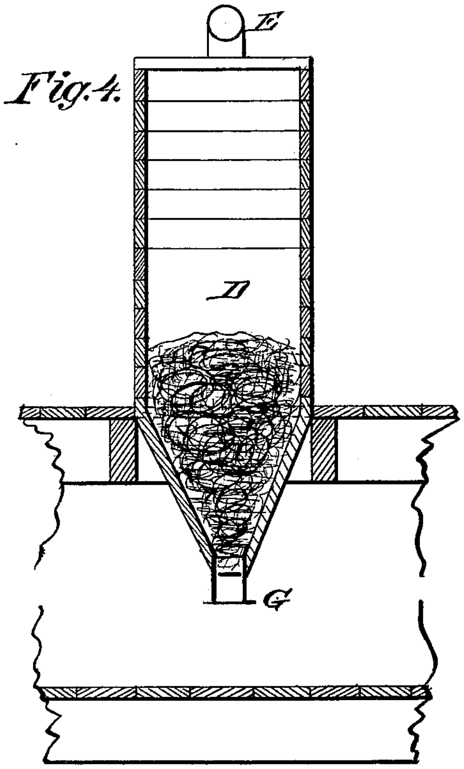


Fig. 5.

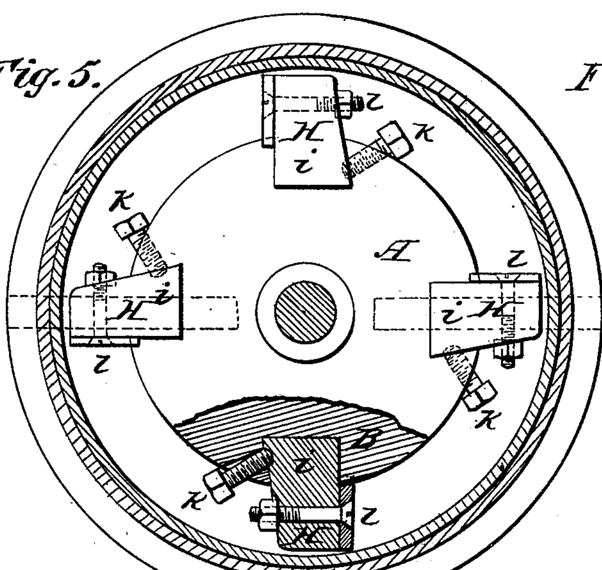
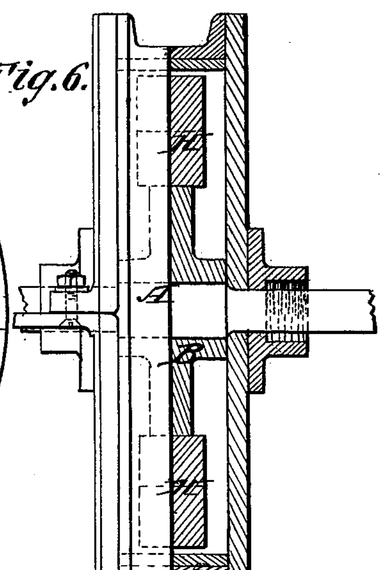


Fig. 6.



Witnesses

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E. H. Watson

Inventor

John W. Foulks

Per Howard C. Cady Attorneys

UNITED STATES PATENT OFFICE.

JOHN W. FOULKS, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN ORE-MILLS.

Specification forming part of Letters Patent No. **200,790**, dated February 26, 1878; application filed February 21, 1878.

To all whom it may concern:

Be it known that I, JOHN W. FOULKS, of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Machines for Grinding and Pulverizing Quartz, Minerals, and other materials; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention has reference to improvements on the machine described and referred to in Letters Patent of the United States No. 122,748, granted January 16, 1872, to Jerome Josiah Webster, and assigned to me (by mesne assignments) September 13, 1876, and recorded September 18, 1876.

Figure 1 represents a lateral view, partly in section, of my invention. Fig. 2 is a plan view of the device, with interior of receiving-chamber partly disclosed. Fig. 3 is an end elevation of the device, with the feed-hopper in section. Fig. 4 is a cross-section of part of the receiving-chamber. Fig. 5 represents a cross-section of the casing, disclosing the grinding-wheel, and one of the hammers and means of attaching the same in cross-section. Fig. 6 is an end view of the same, partly in section.

A, Fig. 1, refers to a casing inclosing a grinding-wheel, B. (Shown in Fig. 5.) The casing A is formed in two sections, an upper and lower, provided with flanges *o o* at their edges, by which they are bolted together, as shown. C refers to a feed-hopper, surmounting the casing A. The lower portion of this hopper is formed in two parts, so as to cause it to stride the casing A; and these two parts terminate in pipe-elbow *c* and *d*, Fig. 3, secured to the upper section of the casing and communicating with its interior.

The main part of the feed-hopper is divided transversely into two compartments, *e* and *f*, the former to contain the material to be ground, and communicating by pipes *c* and *d*, Fig. 3, with the interior of the casing A. The compartment *f* has air-aperture *g* at its lower end, and communicates with the air-tube E.

D is a receiving-chamber, having the bottom provided with a series of discharge-spouts, G, to convey away the material. Windows or doors, one or more, may be made, if desired, in the side of chamber D, to afford means of observing the escape of dust and chaff. E is an air-tube, connecting chamber D with compartment *f* and tubes *a* and *b*. *a* and *b* are air-tubes, as well as conveyers, connecting casing A with the chamber D, whereby the pulverized material is carried from the grinding-wheel B to the receiving-chamber.

The chamber D is constructed with a fender, F, secured to its sides and bottom, back of the discharge-spout G nearest the grinding-wheel, and rising abreast of and slightly above the tubes *a* and *b*. This fender serves to arrest the flying material emerging from the said tubes *a* and *b*, causing the heavier portion to fall into the first discharge-spout G, while the current of air carries the lighter portion over the fender F. The means set forth afford a circulation of air by the outlet at the end of the chamber D, extending upward into and back through the pipe or tube E to the compartment *f*. Of the material which is carried over the fender F, the heavier part falls by its gravity into the next or second discharge-spout G, and the dust and chaff passes on and drops into the discharge-spout G farthest from the fender F.

The operation of this machine is as follows: The material to be pulverized is placed in compartment *e* of the hopper, through an aperture closed by a suitable cover, *h*, to hold the same. The grinding-wheel B having been set in motion by suitable gearing connecting with its axle outside, a current of air is started by its motion through pipes *a* and *b*, conveying the material ground into the receiving-chamber D, where the material is arrested by a fender, F, causing the heavier portion to fall throught the first of a series of discharge-spouts, G, at the bottom of receiving-chamber D, while the lighter portion is carried over the fender, and, according to its gravity, falls into the second or farthest spout G.

The grinding-wheel B, which is an improve-

ment on that of the Webster Letters Patent hereinbefore mentioned, is provided with detachable hammers H. These hammers are wedge-shaped, and the larger portion fits into corresponding mortises *i* in the periphery of the grinding-wheel. The oblique shape of the hammers prevents their slipping or working loose in their sockets when adjusted in place by a set-screw, *k*. In constant action the faces of the hammers become worn, and to ameliorate this I have found it advantageous to secure a plate of steel or other hard metal to their surfaces by a screw, *l*, or any other convenient means.

The advantage of the series of discharge hoppers or spouts G is that the material pulverized is separated and collected, as follows: The fender F aids to secure the heavier material by the gravity thereof, while the current of air carries the lighter parts and dust up and over the fender, and again into the second or onto the third or farthest discharge-hopper or spout G, according to the gravity of the same; and, in the main, the lighter dust or waste will find the farthest discharge hopper or spout from the tubes *a* and *b*.

What I claim is—

1. The feed-hopper constructed with air-chamber *f* and compartment *e*, in combination with the casing A, provided with pipes *c* and *d*, as and for the purposes shown and described.

2. The wedge-shaped hammers, provided with the removable hard-metal faces, in combination with the grinding-wheel, mortised obliquely or wedge-like to properly seat the hammers, which latter are fastened with set-screws, as and for the purposes shown and described.

3. The chamber D, provided with the fender F, in combination with air-tube E, the hopper C, having the compartment *f*, casing A, and tubes *a b*, whereby a continuous current of air is maintained, as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOHN W. FOULKS.

Witnesses:

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HOWARD C. CADY.