(No Model.)

E. I. NICHOLS.

QUARTZ BREAKER AND PULVERIZER.

No. 344,004. Patented June 22, 1886.

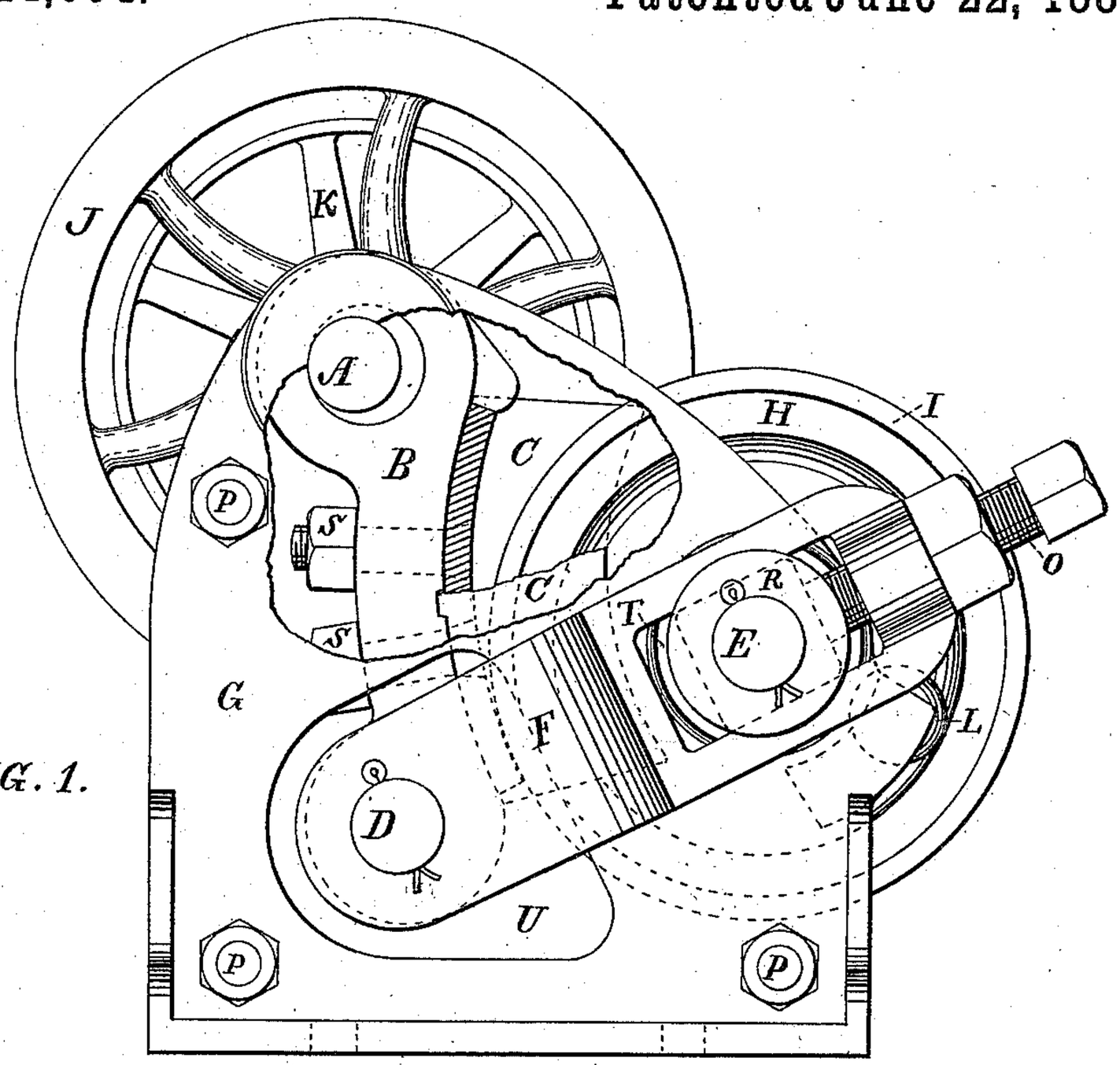

FIG. 1.

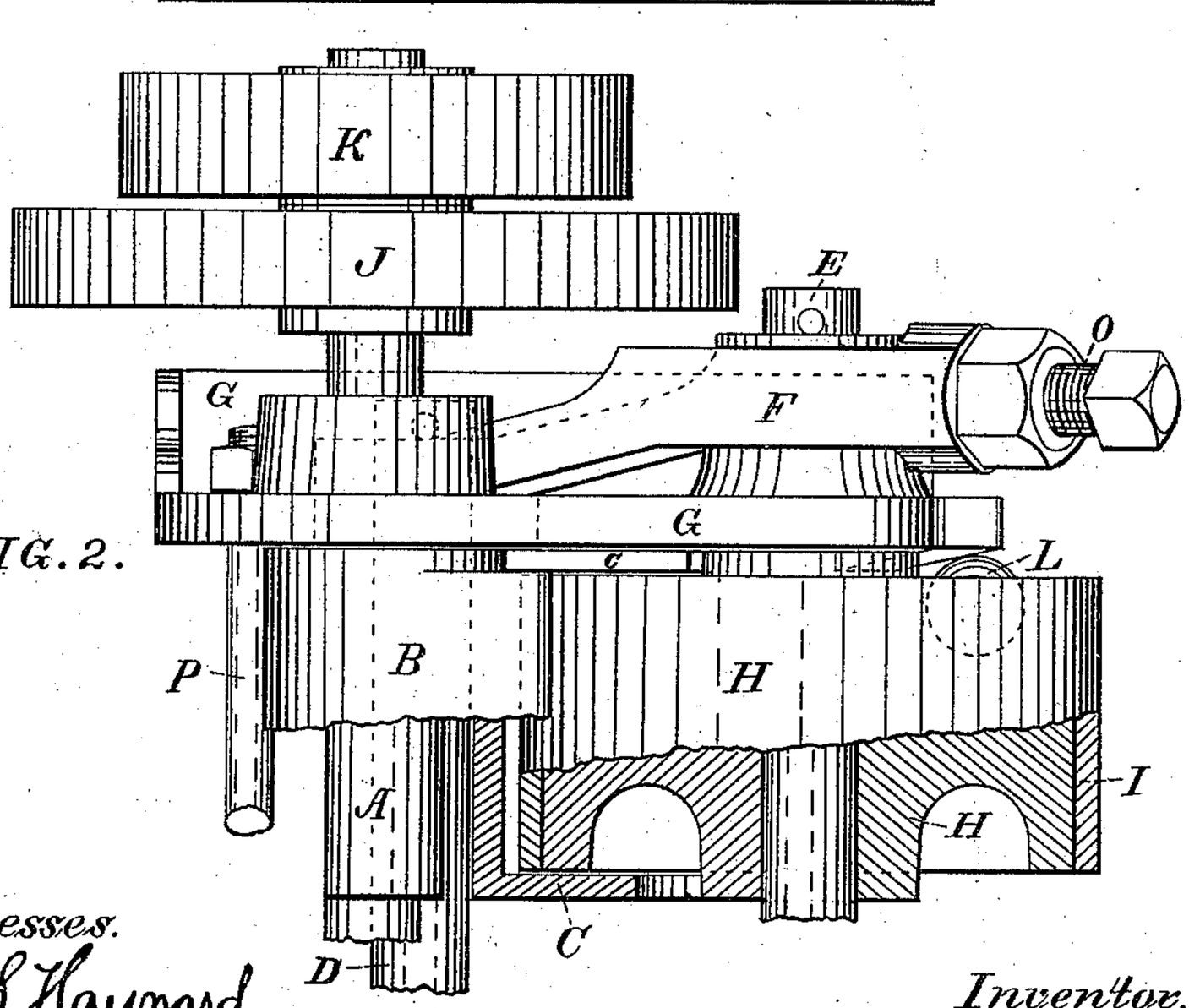

FIG. 2.

Witnesses.
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UNITED STATES PATENT OFFICE.

EMORY I. NICHOLS, OF SAN FRANCISCO, CALIFORNIA.

QUARTZ BREAKER AND PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 344,004, dated June 22, 1886.

Application filed December 31, 1885. Serial No. 187,299. (No model.)

To all whom it may concern:

Be it known that I, EMORY I. NICHOLS, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Quartz Breakers and Pulverizers, of which the following is a specification.

My invention relates to improvements in that class of quartz breakers and pulverizers in which a concave jaw mounted on a revolving eccentric-shaft operates in conjunction with a convex jaw or cylinder, the shaft of which is connected by bars with the lower end of the jaw.

My improvements are embodied in the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the quartz breaker and pulverizer with parts broken away to show the jaw, shoe, and cylinder. Fig. 2 is a top view of part of the machine, showing the pulley, the balance wheel, and a portion of the jaw and cylinder partly in plan and partly in section.

The same letters refer to the same or corresponding parts throughout the two views.

The sides or frame G G, Figs. 1 and 2, are fastened together by bolts P P, which form the body or frame-work of the machine and carries the eccentric-shaft A and the cylinder-shaft E.

By the revolving of the eccentric-shaft A the concave jaw B B is moved to and from the cylinder H in a rotary oscillating motion at the upper end of jaw B and gradually decreasing to the lower end of jaw B, where it is an up-and-down motion, which is attained by the following construction: Through the lower portion of jaw B extends the horizontal shaft D, each end of which projects through the lower end of an inclined connecting-bar, F. The upper end of each of bars F is longitudinally slotted, as shown, for the reception of sliding boxes R. Boxes R form the bearings of the projecting ends of shaft E of the crushing-cylinder H. The lower end of jaw B is held at the desired distance from the cylinder H by set-screws O O in the ends of connecting-bars F F, working against the sliding boxes R R.

The rubbers or springs T T serve to keep the sliding boxes tight against set-screws O O.

The shoe C C is bolted to jaw B by bolts S S, and is formed as a curved plate with inwardly-projecting sides or guards *c c* and a transverse rib across the middle of the under surface, which fits into a corresponding groove across the middle of the face of the jaw B, and of such a shape that the cylinder H will work between the sides of shoe C C.

Cylinder H is made with a chilled face or with a steel tire, I I. The balls L L lie in the groove formed in each head of cylinder H, as shown in Fig. 2, and against the curved wedge-shaped projection formed on the inner face of each side of the frame, which allows the cylinder H to move with the downstroke of concave jaw B, but stops the cylinder H from moving back as the jaw B moves up again, thus allowing the free discharge of quartz or other substance as fast as broken or pulverized.

U are the openings through sides G G through which the ends of shaft D project to engage the connecting-bars F, as shown in Figs. 1 and 2.

Eccentric-shaft A is fitted with balance-wheel J and pulley K.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a quartz breaker and pulverizer, the combination of the concave jaw, the eccentric-shaft, the connecting-bars, the cylinder, the supporting-frame, the wedge-formed projections, and the balls, substantially as described.

2. The combination of the jaw, the eccentric-shaft, the shoe with inwardly-projecting sides, the connecting-bars, the cylinder, the supporting-frame, the wedge-formed projections, and the balls, as herein described.

3. The combination of the jaw, the eccentric-shaft, the slotted connecting-bars, the bearings in said slots, the set-screws for adjusting said bearings, the cylinder, the supporting-frame, the wedge-formed projections, and the balls, as described.

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Witnesses:
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