T. A. BLAKE.

Ore-Crusher.

No. 198,561. Patented Dec. 25, 1877.

Fig: 1.

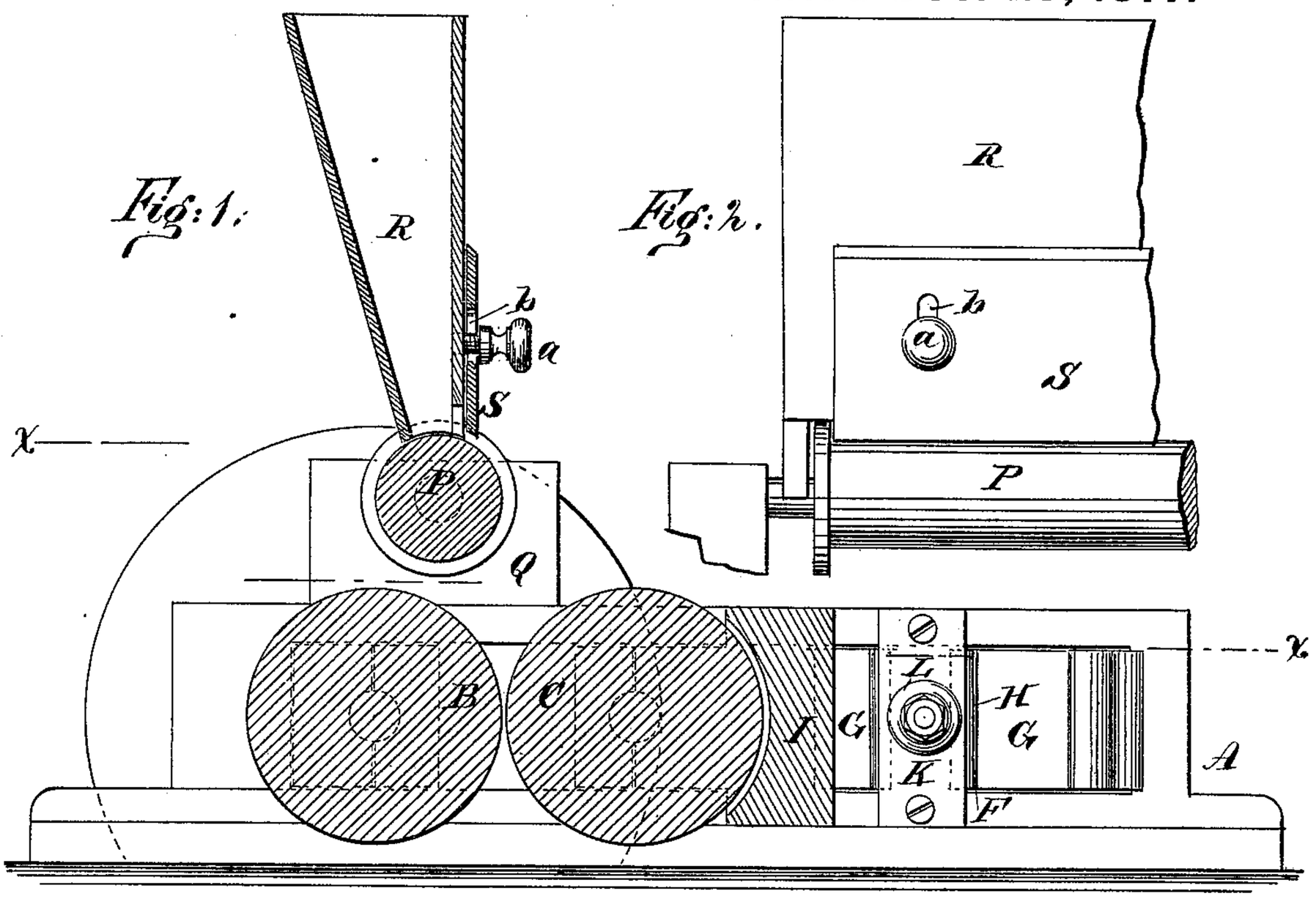
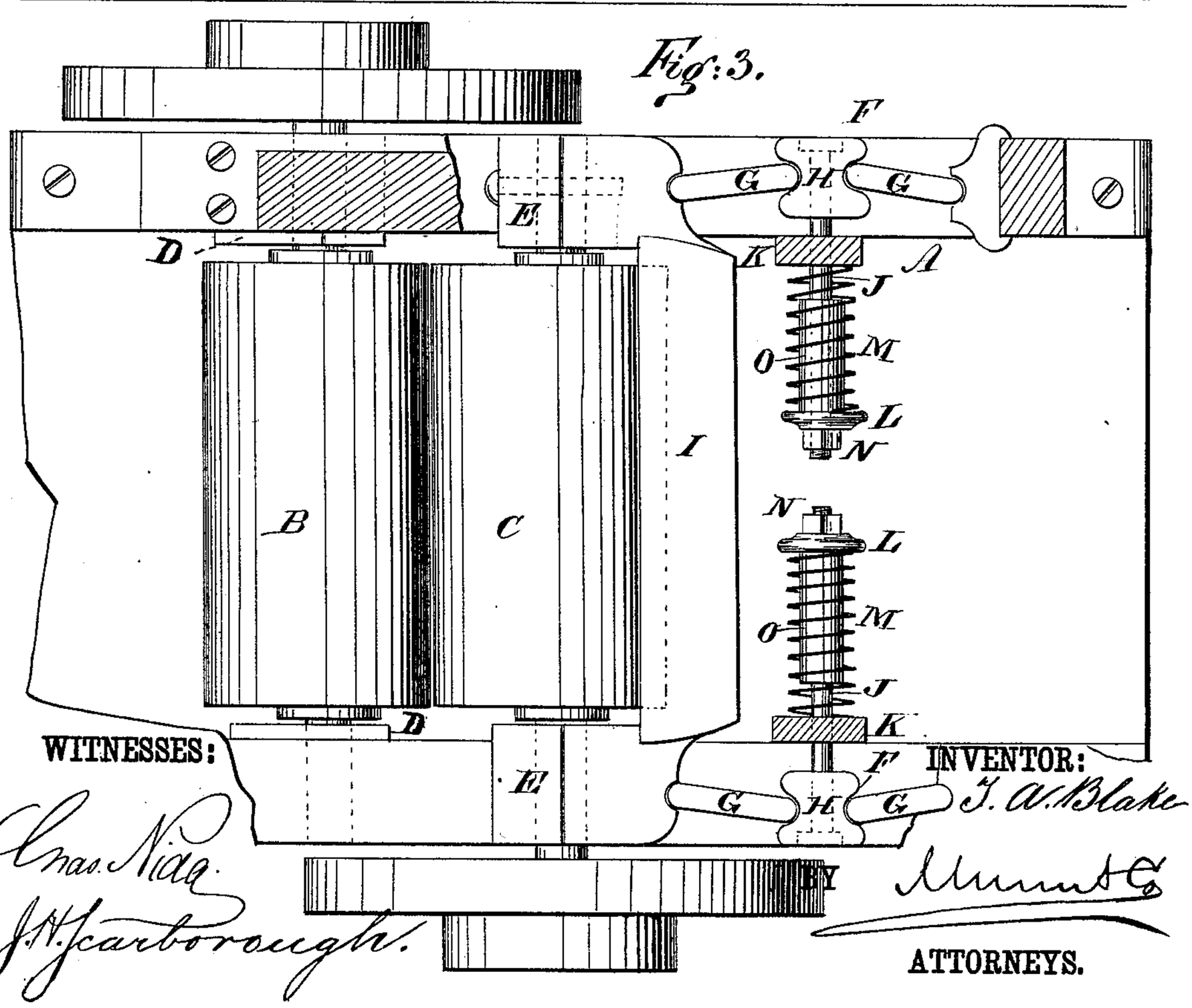


Fig: 2.

Fig: 3.



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THEODORE A. BLAKE, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE BLAKE CRUSHER COMPANY, OF SAME PLACE.

IMPROVEMENT IN ORE-CRUSHERS.

Specification forming part of Letters Patent No. **198,561,** dated December 25, 1877; application filed November 8, 1877.

To all whom it may concern:

Be it known that I, THEODORE A. BLAKE, of New Haven, in the county of New Haven and State of Connecticut, have invented a new and Improved Crushing-Machine, of which the following is a specification:

Figure 1 is a central vertical section of my improved machine. Fig. 2 is a side elevation of a portion of the feeding apparatus. Fig. 3 is a plan view in section, taken on line *x x* in Fig. 1.

Similar letters of reference indicate corresponding parts.

My invention relates to feeding and relief apparatus for crushing-rolls employed in crushing and disintegrating various substances, such as metalliferous ores, &c., to minute fragments or powder, as may be required.

Crushing-rolls, as commonly constructed, are fed with great irregularity, and with fragments which vary considerably in size. This results in great and sudden strains upon the frame or tie-rods of the machine, and in the passage through the rolls of coarse uncrushed material; and owing to the varying resistance of the rolls, due to crushing masses of material, expensive cog-gearing has been employed to drive the rolls, and to cause them to rotate together.

To obviate these difficulties, to cheapen the machine, to lessen its liability to breakage, and to render it more efficient, is the object of my invention.

In the drawing, A is the frame of the machine, in which two rolls, B C, are placed. The shaft of the roll B revolves in fixed boxes D, and the shaft of the roll C revolves in boxes E, that are capable of sliding longitudinally in the frame A.

Between the boxes E and the end of the frame a toggle, F, is placed, which consists of two toggle-arms, G, and the movable head H. The toggle-arms have rounded ends, which rest in concavities formed in the boxes E, in the end of the frame A, and in the head H.

The boxes E, on opposite sides of the machine, are attached to a concave piece, I, which partly encircles the roll C, and keeps the boxes in the proper relation to each other.

A rod, J, is attached to each of the heads H, and extends toward the center of the frame A, through vertical cross-bars K, attached to the ways in which the boxes E and toggle F move.

Upon the rods J chambered washers L are placed, between which and the vertical bars K (which are also chambered) coiled springs M are placed. A nut, N, is placed on each of the rods outside of the washer L, for adjusting the spring M.

Thimbles O are placed loosely on the rods J, for keeping the springs straight and equally distant from the rod.

Each of the rolls B C is provided with a heavy fly-wheel, and with a pulley, for receiving a driving-belt. Above the roll B a roll, P, having flanged ends, is journaled in pillow-blocks Q, attached to the frame A. To these pillow-blocks a hopper, R, is attached, one side of which is fitted closely to the roll P. The other side is open for a short distance above the roll, and is provided with an adjustable sliding cover, S, retained in place by two screws, *a*, which pass through slots *b*, formed in the cover, into side of the hopper.

Materials to be crushed are broken to a uniform size and placed in the hopper. The sliding cover S is adjusted to supply the required amount of material to the rolls, and motion is imparted to the roll P and to the rolls B C. The rotation of the roll P causes an even supply of material to fall from the hopper to the rolls B C, where they are crushed and reduced to a uniform powder, either coarse or fine, as may be required. The rolls, being uniformly fed, may be run at a high velocity.

Under sudden strain the rolls are permitted to yield without the necessity of overcoming increased resistance, as in the case of ordinary springs, and are made to regain their position quickly by the action of the toggle.

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

1. A spring-actuated toggle, in combination with the boxes of the movable crushing-roll, substantially as herein shown and described.

2. The boxes E E, connected by a bar, I, said bar being concaved to partly surround the roll C, as and for the purpose specified.

3. The toggle-arms G, head H, rod J, spring M, movable box E, and frame A, having the bar K, in combination, as herein shown and described.

THEODORE AUGUSTUS BLAKE.

Witnesses:

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