A. Hitchcock,

Ore Mill.

No. 50,247. Patented Oct. 3. 1865.

Fig. 1

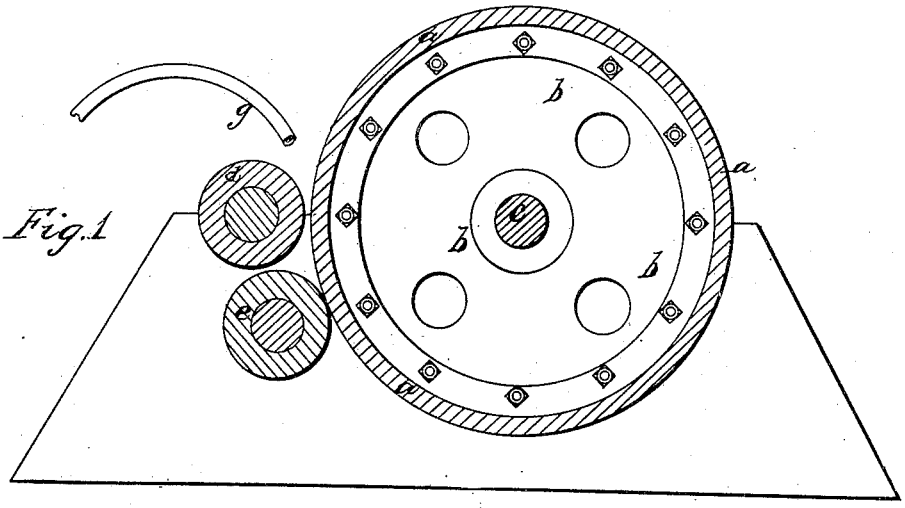
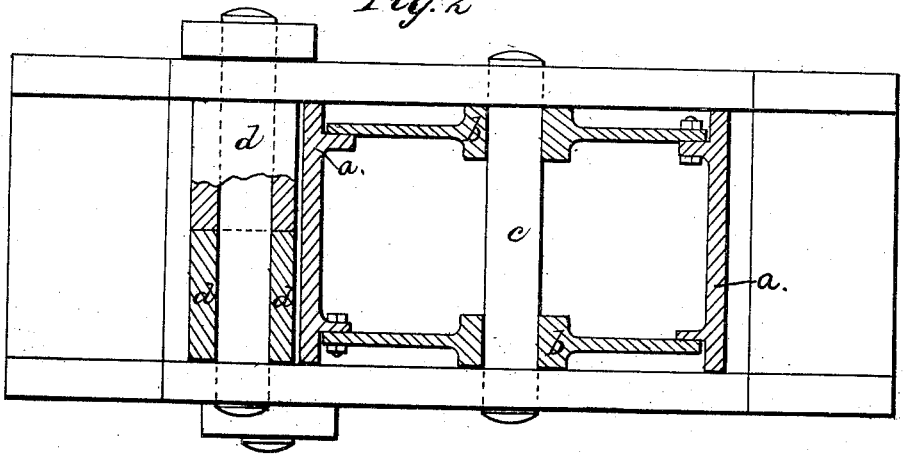


Fig. 2



Witnesses
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UNITED STATES PATENT OFFICE.

ALONZO HITCHCOCK, OF NEW YORK, N. Y.

IMPROVEMENT IN ROLLER CRUSHING-MACHINES.

Specification forming part of Letters Patent No. 50,247, dated October 3, 1865; antedated September 23, 1865.

To all whom it may concern:

Be it known that I, ALONZO HITCHCOCK, of New York, in the county and State of New York, have invented certain new and useful Improvements in Roller Crushing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, making a part of this specification, and to the letters of reference marked thereon.

My invention relates to machines that are used to crush or reduce quartz or other mineral substance after it has already received some mechanical preparation, and it constitutes an improvement on what are ordinarily styled the "Cornish rollers."

It consists of the combination of a large roller with two or more small rollers, that are made in a peculiar way, to admit of an easy adjustment in compensation for their wear, and which are not connected with the large roller by gearing, and are each driven by independent means from the motive power. The machine is placed to receive the material from the machine in which it is primarily prepared by being broken into moderately-sized lumps, and after passing it, in conjunction with a copious stream of water, between the large roller and the small ones in succession, so that the fragments are progressively broken smaller and smaller as they are crushed and ground through the narrower spaces of the succeeding small rollers and the large one, it is finally delivered to the action of a pulverizing-mill, by which its preparation for an amalgamator may be completed. The working-surfaces of the rollers are composed of Franklinite iron or of any other hard material or composition to resist wear, and the small rollers are divided transversely, so that when they become worn in the middle, as ordinarily occurs, the two sections composing a roller may be transposed to change the parts that formed the middle to the ends of the roller. The sections may be keyed to their shafts or secured in any other manner, and the rollers may be supplied with fly-wheels, and with spring or counterbalance-bearings that will yield to any undue strain, in the ordinary manner known to mechanics.

To enable others skilled in the arts to which it appertains to make and use my invention, I will proceed to describe its construction and operation with reference to the drawing.

The large roller *a* is cast of Franklinite iron, and is provided with internal flanges, by which it is bolted to the disks or hubs *b* on the shaft *c*. As this roller is made of very large diameter the wear of the surface is not sufficient to make it necessary to provide for the inequality of its wearing, as in the small rollers, but it may be done, if desirable. The small rollers *d e* are each cast in two lengths or sections that may be changed in positions on their shafts, so that the parts at the middles of the rollers may be placed at the ends. The lower roller of the small ones is placed nearer to the large roller than is the upper one; and when a series of more than two small rollers is employed their respective distances from the large one are gradually diminished, so that each one of the series may perform its proportion of the work in progressively reducing the stuff under operation. The pipe *g* supplies water to the material when first delivered to the machine, and accompanies it in its passage between the rollers.

The frame of the machine and the fly-wheels and yielding bearings of the rollers may be constructed in the ordinary manner, or in any other way that permits the arrangement and construction of the rollers herein described.

It will be seen from the foregoing description that the action of the large roller, being distributed over a comparatively extended surface, will cause it to wear very slowly, and that the ends and middles of the small rollers may be transposed to compensate for any inequality in their wear and that of the large roller, and that when the sections have been changed on the same roller and with others on different rollers as often as may be necessary and practicable, and until they have become too small to be longer retained, they may be replaced with new ones and the machine kept in efficient operation without involving large expenses for transportation from the place of manufacture. The small rollers are set in relation to the large one, and to each other in such a manner that the material and water pass progressively from one to the other; and the entire machine may be combined with a breaker and a pulverizing-mill or amalgama-

tor, to form a series through which the material may pass without assistance from manual labor. The rollers may be driven by connected gearing; but it is preferred to drive them separately and by independent means, so that there may be no interference in their action.

I claim as my invention and desire to secure by Letters Patent—

The construction of the rollers in reversible half lengths or sections, substantially in the manner described.

ALONZO HITCHCOCK.

Witnesses:
DUNHAM J. CRAIN,
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