(No Model.)

F. J. & W. H. HOYT.

MACHINERY FOR CRUSHING ORES, &c.

No. 255,862. Patented Apr. 4, 1882.

Fig. 1.

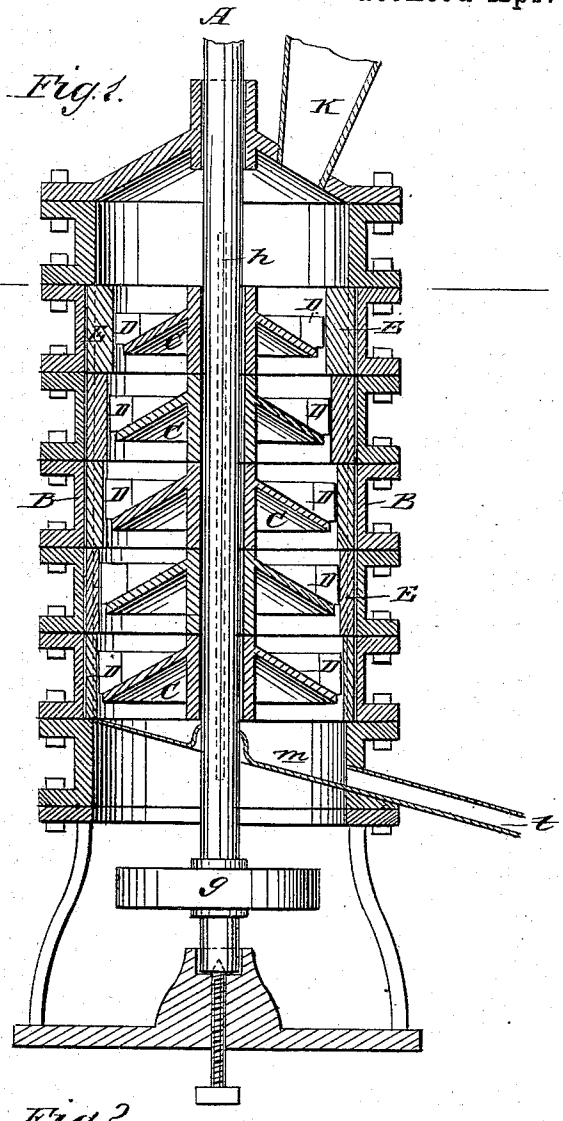
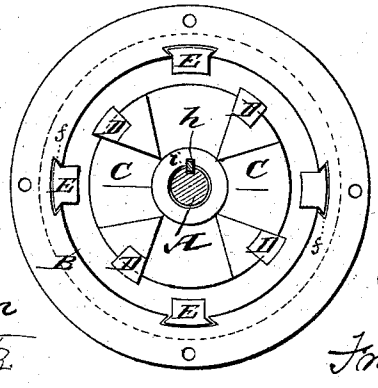


Fig. 2.



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UNITED STATES PATENT OFFICE.

FREDERICK J. HOYT, OF NEW YORK, N. Y., AND WILLIAM H. HOYT, OF JERSEY CITY, NEW JERSEY.

MACHINERY FOR CRUSHING ORES, &c.

SPECIFICATION forming part of Letters Patent No. 255,862, dated April 4, 1882.

Application filed May 14, 1881. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK J. HOYT and WILLIAM H. HOYT, citizens of the United States, and residing respectively at New York city, in the county of New York and State of New York, and at Jersey City, in the county of Hudson and State of New Jersey, have invented new and useful Machinery for Crushing Ores, Bones, or other Similar Materials, of which the following is a specification.

This invention relates to machinery for crushing or comminuting ores, bones, or other similar materials; and it consists in the combination, with a vertical rotary shaft, of disks secured thereon and provided with hammers, and a cylinder provided with lugs or anvils, the said disks successively increasing in diameter from the top to the bottom of the series, and the said lugs or anvils being graded so as to successively extend farther toward the cylinder from the bottom to the top of the series, all of which will be more fully hereinafter described in detail.

This invention is illustrated in the accompanying drawings, in which Figure 1 represents a vertical central section; Fig. 2, a horizontal section.

Similar letters indicate corresponding parts.

The letter A designates the vertical shaft or spindle; B, the shell; C, the crushing-disks; D, the hammers, and E the lugs or anvils.

The shaft A is provided with a pulley, *g*, for imparting thereto a revolving motion, and the crushing-disks C are fixed thereto by means of a feather-key, *h*, engaging the hub *i* of the disks. These disks C are inclined from center to circumference, so that each disk forms a frustum of a cone, and the diameter of the disks gradually increases from the top to the bottom of the machine, as shown.

The hammers D are secured to the upper surfaces of the disks, the working-faces of the hammers, as well as the anvils E, being preferably made of steel. The shell B surrounds the shaft A and its concomitants, being concentric therewith, and being, moreover, in this example made in sections, and the lugs or anvils E are secured to the inner surface of the shell through the medium of dovetails *f*, the latter being fitted into suitable grooves in the shell. These anvils E are so arranged relatively to the hammers D that the latter will just rub by the anvils in the revolution of the disks without grinding, and in most cases a single hammer to each disk will answer the purpose; but we do not of course confine ourselves to any particular number of hammers. These lugs or anvils E are all graded in regular order from the top to the bottom of the series—that is to say, the lugs at the top project to the greatest extent toward the shaft. The lugs next below extend to a lesser extent toward the same, and so on.

The ore or other material to be crushed is fed through a hopper, K, at the top of the machine, and as it falls on the upper revolving disk C the incline of the disk and the centrifugal force tend to carry the material toward the edge of the disk, where it is caught between the hammers D and the anvils E, and is reduced to a size sufficient to drop through the space left between the outer edge of the disk and the inner surface of the shell to the next lower disk, which, having a greater diameter than the upper disk, receives the material, and with its hammers, together with the anvils, acts thereon to further reduce it, and so on until the material has fallen from disk to disk, finally escaping through a spout, *t*, which extends from an inclined plate, *m*, at the bottom of the shell.

The disks have been particularly described as being frusto-conical shaped; but we do not confine ourselves to this form, as the disks may be made with their tops perfectly level, or inclined toward the center, if necessary. Without grading or graduating the lugs and the disks, as hereinbefore described, the ore or bone could not be properly ground.

What we claim as new, and desire to secure by Letters Patent, is—

The combination, with the vertical rotary shaft, of the disks C, secured thereon, and provided with hammers D, the cylinder B, and the lugs or anvils secured in the cylinder,

the said disks successively increasing in diameter from the top to the bottom of the series, and the lugs being graded so as to successively extend farther toward the cylinder from the bottom to the top of the series, substantially as described.

In testimony that we claim the foregoing we have hereunto set our hands this 13th day of May, 1881.

FREDERICK J. HOYT.
WILLIAM H. HOYT.

Witnesses:
FRANCIS CLARE BOWEN,
EDGAR GARRETSON.