T. O. CUTLER.

Bone-Grinding Mill.

No. 212,838. Patented Mar. 4, 1879.

Fig: 3.

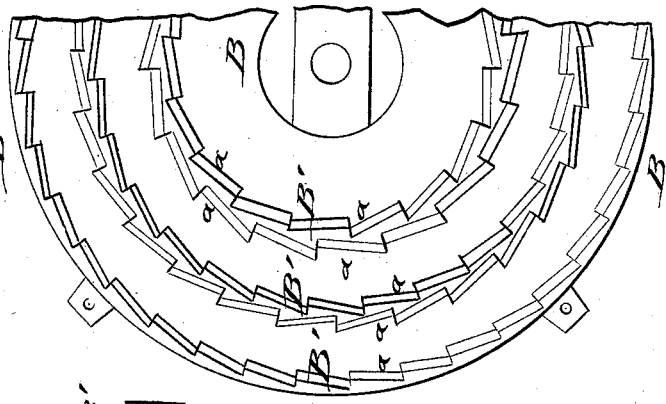


Fig: 1.

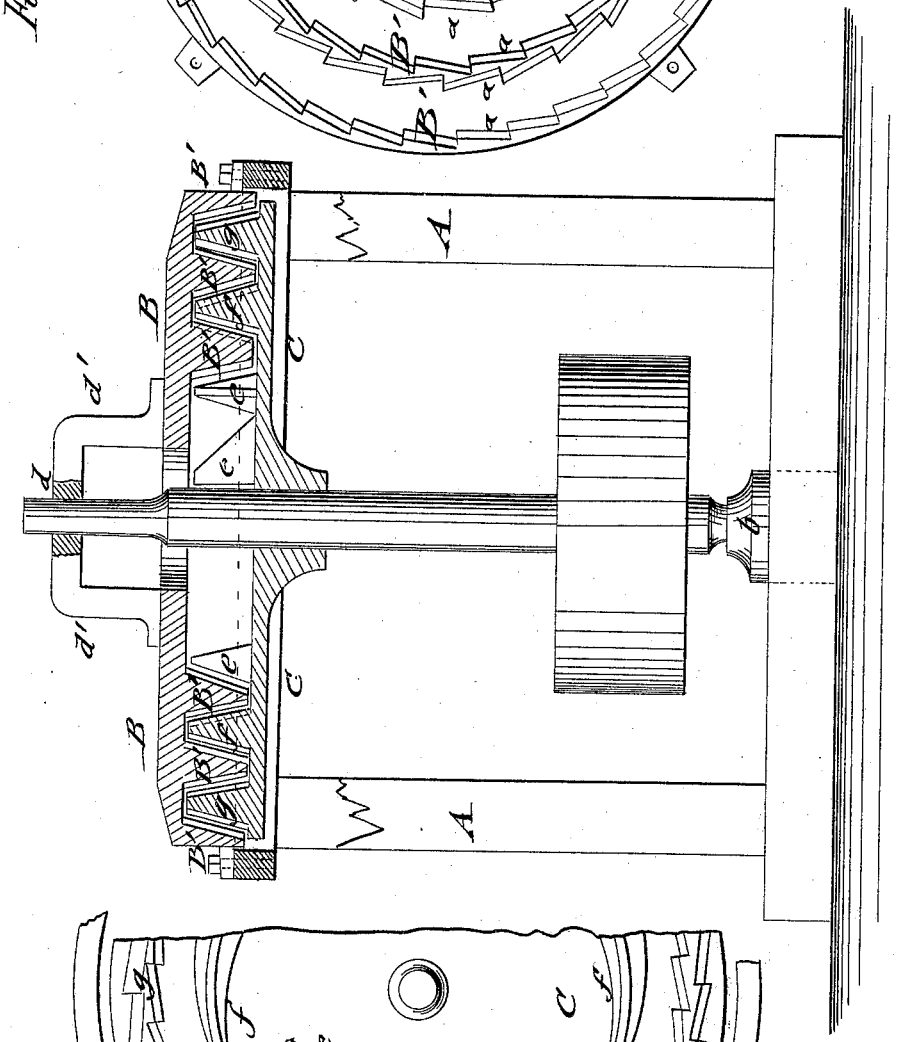
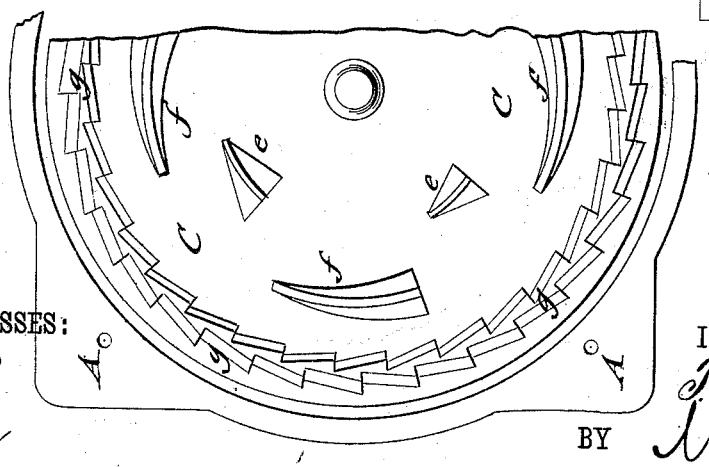


Fig: 2.



WITNESSES:

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THOMAS O. CUTLER, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO HIMSELF AND ADOLPH HIRSH, OF NEW YORK, N. Y.

IMPROVEMENT IN BONE-GRINDING MILLS.

Specification forming part of Letters Patent No. **212,838**, dated March 4, 1879; application filed August 20, 1878.

To all whom it may concern:

Be it known that I, THOMAS O. CUTLER, of Jersey City, in the county of Hudson, State of New Jersey, have invented a new and Improved Bone-Grinding Mill, of which the following is a specification:

In the accompanying drawings, Figure 1 represents a vertical central section of my improved bone-grinding mill, and Figs. 2 and 3 are respectively a top view of the revolving runner-section and a bottom view of the stationary head-section.

Similar letters of reference indicate corresponding parts.

The invention relates to an improved mill for grinding bones, phosphates, and similar articles in superior and effective manner; and it consists of a fixed top section or casing, with notched concentric and tapering ridges, in combination with a revolving runner having short inner beaters, longer intermediate beaters, and an outer notched and circular ridge, the substances to be ground being passed from the center outward, and discharged in ground state between the outer ridge of the top casing and the outer ridge of the runner.

Referring to the drawings, A represents the supporting-frame of my improved mill for grinding bones, phosphates, and other substances. To the top of frame A is attached, in any suitable manner, a fixed top section or casing, B, which has a center opening for charging the mill with the substances to be ground. The top section, B, is provided with concentric ridges B′, that are made tapering from their broader base to their narrower tops, and provided with alternating notches *a* at both sides, said notches forming teeth that take up the substances and expose them to the action of the beaters of a revolving runner, C. The spindle of the revolving runner C is supported in a bottom step, *b*, of frame A, and in a bearing, *d*, of a stationary yoke, *d′*, at the top of the fixed top section, B. The runner is revolved by suitable power, and adjusted closer to or farther from the fixed section by any well-known and approved mechanism.

The revolving runner C is provided with short inner beaters, *e*, of triangular and upward-tapering shape, which work in conjunction with the notched inner ridge of the top. The beaters *e* are equidistant from each other and from the spindle, and exert a breaking action on the substances fed to the mill. The broken-up parts pass then, owing to the centrifugal force imparted by the speed of the revolving runner, outward, and are acted upon by intermediate but longer beaters, *f*, that are also of tapering triangular shape, and arranged equidistant from the center, but intermediately between the inner beaters. The longer beaters work in conjunction with the adjacent notches of the inner and middle ridges of the top section, and reduce the already broken-up substances to smaller size. These coarsely-ground particles pass then toward the circumference of the runner, and are taken up by the slanting teeth of an outermost notched ridge, *g*, that corresponds in shape to the ridges of the top section, and works in conjunction with the notched sides of the intermediate and outermost ridges of the same. The finely-ground particles pass finally out at the circumference of the runner, and are conducted by a hopper-shaped trough, or in other suitable manner, to a suitable receptacle.

The runner may be revolved in such a manner that the beaters of the runner work against the teeth of the top section and break up and grind the substances; or the runner may be run backward, so as to crush the substances; or the runner may be run in the direction described, but the notches of the ridges of the top section arranged in opposite direction to that shown.

In all cases the substances are first broken up, then the broken-up coarse parts reduced to a finer state, and finally ground up into fine state and passed out at the circumference of the mill.

A powerful, rapidly-working, and highly-ef-

fective grinding-mill for bones, phosphates, and mineral substances is thus obtained.

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

In a mill, the fixed top section or casing, B, having a central opening to receive grist, and concentric ridges B′, the latter provided with a double row of teeth, in combination with a runner, C, having fixed inner shorter beaters, *e*, intermediate fixed longer beaters, *f*, and outer-ridge teeth, *g*, arranged as shown and described, for the purpose specified.

T. O. CUTLER.

Witnesses:
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