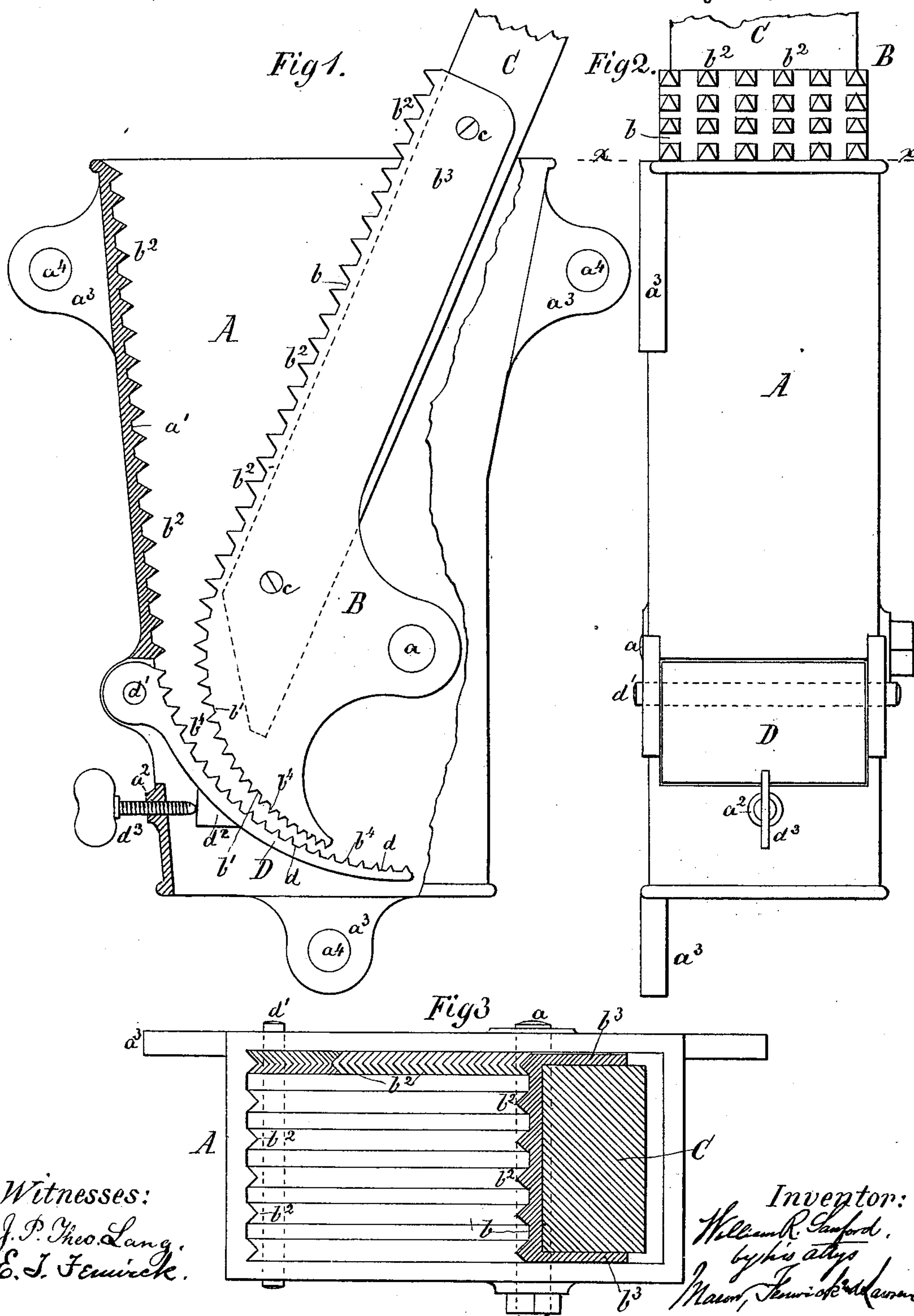


W. R. SANFORD.

No. 386,165.

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UNITED STATES PATENT OFFICE.

WILLIAM R. SANFORD, OF FLEMINGTON, NEW JERSEY, ASSIGNOR OF TWO-THIRDS TO FRANK B. MALLORY, OF SAME PLACE, AND GELSTON C. SANFORD, OF BROOKLYN, NEW YORK.

COMBINED HAND CRUSHER AND GRINDER.

SPECIFICATION forming part of Letters Patent No. 386,165, dated July 17, 1888.

Application filed February 11, 1888. Serial No. 263,755. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. SANFORD, a citizen of the United States, residing at Flemington, in the county of Hunterdon and State of New Jersey, have invented certain new and useful Improvements in a Combined Hand Crusher and Grinder; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines for crushing and grinding bones, shells, and other substances by hand-power; and it consists in certain constructions, combinations, and arrangement of parts, as hereinafter described and specifically claimed, whereby a very effective, simple, cheap, and enduring machine for the above-named purposes is produced.

In the accompanying drawings, Figure 1 is a view of my invention, partly shown in vertical section, so as to exhibit the internal construction, and having a part of its handle broken off. Fig. 2 is a front view of the same, and Fig. 3 is a horizontal section in the line X X of Fig. 2.

The letter A in the drawings represents an upright oblong shell or hopper of metal, to which, by means of a pin, a , a crushing-jaw, B, is pivoted. The crushing-jaw B has a straight upper crushing-surface, b , and a curved lower grinding-surface, b' , as shown. The curved surface b' begins flush with the straight surface b at a point about horizontally opposite the pivot-pin a . Said surfaces b b' are provided with pyramidal teeth b^2 b^4 , arranged in parallel rows, the teeth upon the curved surface being gradually diminished in size toward the discharging end of the crushing and grinding jaw. Side flanges, b^3 , are formed upon the jaw for the purpose of strengthening the same and also holding between them the lever-handle C, of either wood or metal, which is fastened thereto by screw c , or otherwise suitably secured. Opposite the toothed straight surface b of the crushing-jaw the inner surface, a' , of the shell or hopper A is provided with pyramidal crushing-teeth b^2 , similar to those b^2 of the jaw B, and opposite the curved surface b' an adjustable grinding-plate, D, is provided, having a

curved surface, d , with teeth b^4 , gradually diminishing in size, corresponding with those b^2 on the curved surface b' of the jaw B. This plate D is pivoted at d' to the shell A, so that it and its teeth b^4 form a flush continuation of the shell A—that is, of the toothed straight inner surface, a' , thereof. An abutment-lug, d^2 , is formed on the under side of the plate D, and against this lug the end of an adjusting-screw, d^3 , held in a suitable boss, a^2 , of the shell A, is made to bear, as shown, and by this construction the lower part of the combined crusher and grinder can be adjusted so as to move the diminishing toothed surface d closer to or farther from the curved diminishing toothed surface b' , and thus the crushed materials can be more or less finely reduced below the plane of the pivots a and d' before being discharged.

The shell or hopper A may, as shown, be provided with lugs a^3 , having holes a^4 , by means of which it can be screwed or bolted to the framed portion of a building while being used.

From the foregoing specification and accompanying drawings it will be seen that I have provided a crusher and grinder which will be very useful to the farmer for reducing bone, shell, or other substances for use as poultry food and for other purposes, which substances are now not often utilized by him for want of such cheap crusher and grinder, and it being inconvenient and unprofitable for him to carry the same to a distant mill to have them ground.

I contemplate varying the dress of the crushing and grinding surfaces so as to adapt the crusher and grinder to the nature of the substances requiring to be reduced.

What I claim is—

1. The within-described hand crusher and grinder, comprising crusher-shell having portion A, with crushing-teeth b^2 on its inner straight surface, a' , curved grinding portion D, having gradually-diminishing teeth b^4 on its inner curved surface, d , and the pivoted crushing-jaw B, attached to lever-handle C and having crushing-teeth b^2 on its straight surface b and gradually-diminishing grinding-teeth b^4 on its curved surface b' , substantially as and for the purpose described.

2. The within-described hand crusher and

grinder, comprising crushing shell and jaw, with the straight and uniformly-toothed surfaces a' and b and the curved surfaces b' and d , one of which is adjustable and both having
5 teeth b^4 , gradually diminishing in size toward the ends thereof, substantially as and for the purpose described.

3. The hand crusher and grinder comprising crusher-shell having hopper portion A, with
10 crushing-teeth b^2 , curved, pivoted, and adjustable grinding portion D, having grinding-teeth b^4 , and the jaw B, having bolting-flanges, and the handle C, arranged behind the toothed surfaces and forming an upward extension of said
15 jaw, substantially as described.

4. The combined hand crusher and grinder, comprising the toothed shell or hopper A, curved toothed jaw B, upwardly-extending hand-lever C, attached to said jaw, swinging curved toothed plate D, pivoted to the lower
20 end of said hopper, having lug d^2 , and adjusting-screw d^3 , supported in boss a^2 of shell A, substantially as and for the purpose described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

WILLIAM R. SANFORD.

Witnesses:

C. A. REED,

B. H. BERKAW.