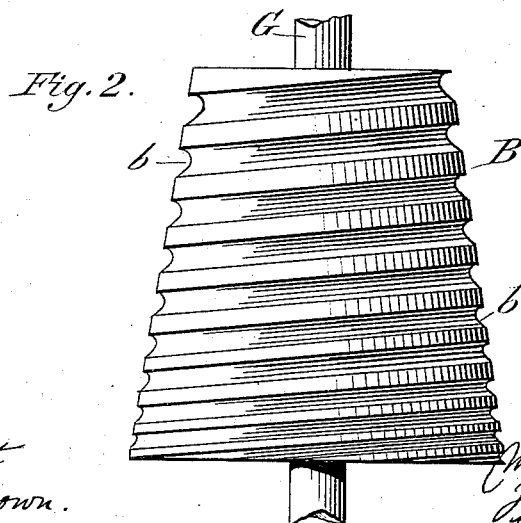
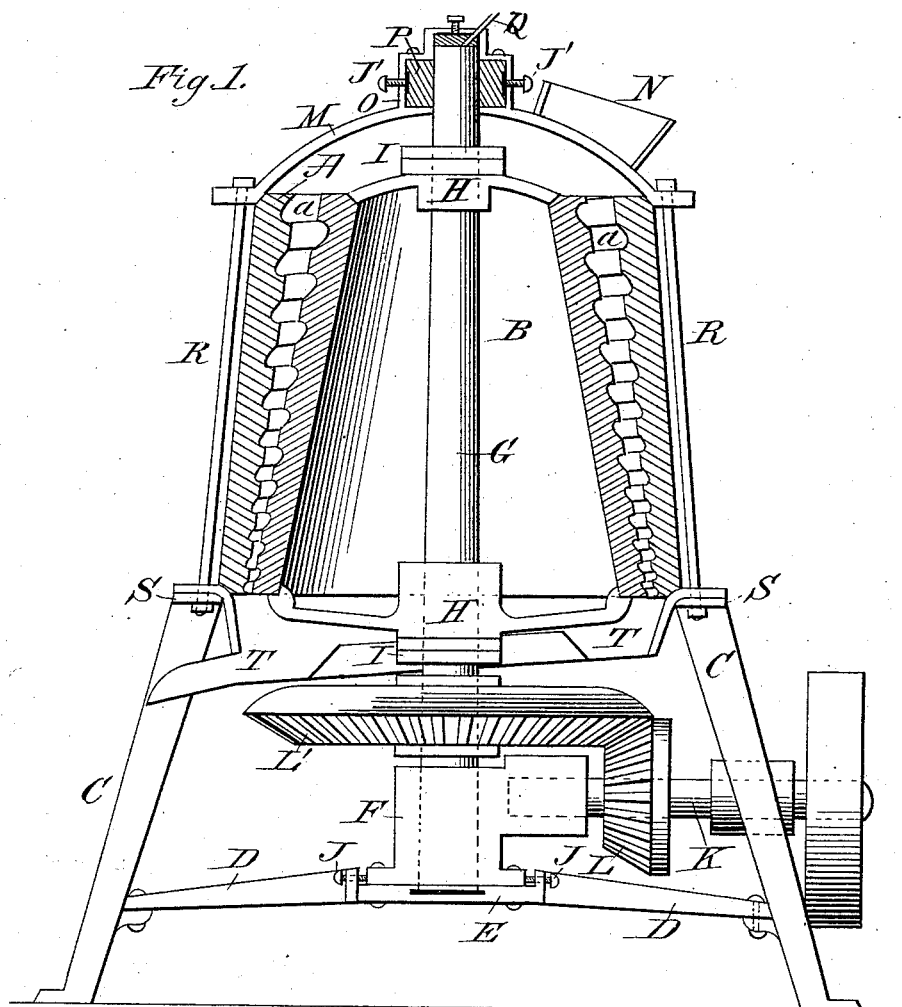


(No Model.)
M. T. VAN DERVEER & J. HEGEMAN.

ORE CRUSHER AND PULVERIZER.

No. 305,357.

Patented Sept. 16, 1884.



Attest:

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UNITED STATES PATENT OFFICE.

MILTON T. VAN DERVEER AND JOHN HEGEMAN, OF AMSTERDAM, NEW YORK.

ORE CRUSHER AND PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 305,357, dated September 16, 1884.

Application filed January 7, 1884. (No model.)

To all whom it may concern:

Be it known that we, MILTON T. VAN DERVEER and JOHN HEGEMAN, citizens of the United States, residing at Amsterdam, in the county of Montgomery and State of New York, have invented certain new and useful Improvements in Ore Crushers and Pulverizers; and we do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to an improved ore crusher or pulverizer; and it consists in certain peculiarities in the construction and combination of parts, as hereinafter more fully set forth.

In the annexed drawings, illustrating the invention, Figure 1 is a sectional elevation of our improved ore-crusher. Fig. 2 is a side view of the rotary cone.

The machine consists of an internally-grooved shell, A, that incloses a hollow rotary cone, B, having external grooves. The machine is supported on standards C, that are connected near the bottom by a spider, D, having a central annular flange, E, in which is supported a step, F, for the lower end of a vertical shaft, G, on which the rotary cone B is mounted. The hollow cone B is closed at top and bottom by disks H H, having collars that surround the shaft G; and the cone is held in place on its shaft by adjustable nuts I I, that are placed on the shaft above and below the cone in contact with the disks H H, that form its ends. By moving these nuts I I up or down on the shaft G the rotary cone B can thus be adjusted vertically to any desired position with relation to the inclosing-shell. The step F, besides supporting the shaft G, also forms a bearing for one end of a driving-shaft, K, that carries a pinion or bevel gear, L, which meshes with a similar gear, L', on the shaft G, thus rotating the cone or crushing-roll. The shell A is provided with a dome, M, having a hopper, N, through which ore is introduced. It is also provided at the top

with a journal box or casing, O, in which is inclosed a bearing of lignum-vitæ or other suitable material for the upper end of the shaft G. The cone B is centered properly through a lateral adjustment of the step F by means of set-screws J J at the bottom and by set-screws J' J', passed through the box or casing O, at the top. Water is admitted to the casing O and shaft G through a tube, Q, for lubricating, thus avoiding the use of oil, which would be objectionable by coming in contact with the crushed material. The dome M is connected by bolts or rods R R to a ledge or flange, S, at the base of the shell A, said bolts or rods also serving to support beneath the shell and its rotary cone B an annular pan, T, for receiving the reduced material. This pan T is formed with an inclined bottom, as shown, and is provided on one side with a spout through which the crushed material is discharged.

It will be observed that the shell A and rotary cone B are both grooved spirally, the groove or grooves on each being continuous from top to bottom. These grooves *a b* are each reduced in width and depth from top to bottom, the threads being arranged more closely together at the bottom than at the top. It is obvious that the grooves may be arranged with more or less pitch of screw or gain of twist, as desired. These grooves may be cut into the shell and its cone, or they may be formed by covering the inner surface of the shell and the exterior of the cone with metallic bands or ridges arranged in a spiral.

It will also be observed that the opposing surfaces of the cone and shell are formed on different angles, so that when inclosed one within the other, as shown in Fig. 1, there is a larger space between them at top than there is at bottom. This difference in the distance between the cone and shell at top and bottom is further increased by the greater depth of the grooves *a b* at their upper ends, said grooves and the intervening threads or ridges extending around and completely covering the cone and opposing inner surface of the shell, the threads or ridges gradually diminishing in width from top to bottom, and the grooves gradually diminishing in width and

depth from above to below. It is obvious that the grooves and ridges on the opposing surfaces of the cone and shell may be made to run in the same direction or in opposite directions, as desired.

It will be seen that the material passed through the hopper N will fall between the crushing-surfaces and be caught by the spiral threads or grooves *a b*, where it is broken or crushed more or less finely by the wedge-like or twisting action of the thread striking down upon it while the cone B is revolved. This action is continued as the material passes toward the lower part of the machine until the requisite fineness is attained, the crushed material being received by the pan T, whence it gradually escapes.

Having thus described our invention, what we claim is—

20 1. The combination, in an ore crusher and pulverizer, of a cone and shell formed on dif-

ferent angles and arranged with a larger space between them at top than at bottom, the opposing surfaces of said cone and shell being provided with continuous spiral threads or ridges, and also with grooves that diminish in width and depth from top to bottom, said threads and grooves completely covering said surfaces, substantially as described. 25

2. The herein-described ore crusher and pulverizer, comprising the shell A, having ledge S, the dome M, the annular pan I, bolts or rods R R, rotary shaft G, and the vertically and laterally adjustable cone B, substantially as shown and described. 30

In testimony whereof we affix our signatures in presence of two witnesses.

MILTON T. VAN DERVEER.

JOHN HEGEMAN.

Witnesses:

J. SPENCER FISHER,

M. L. STOVER.