

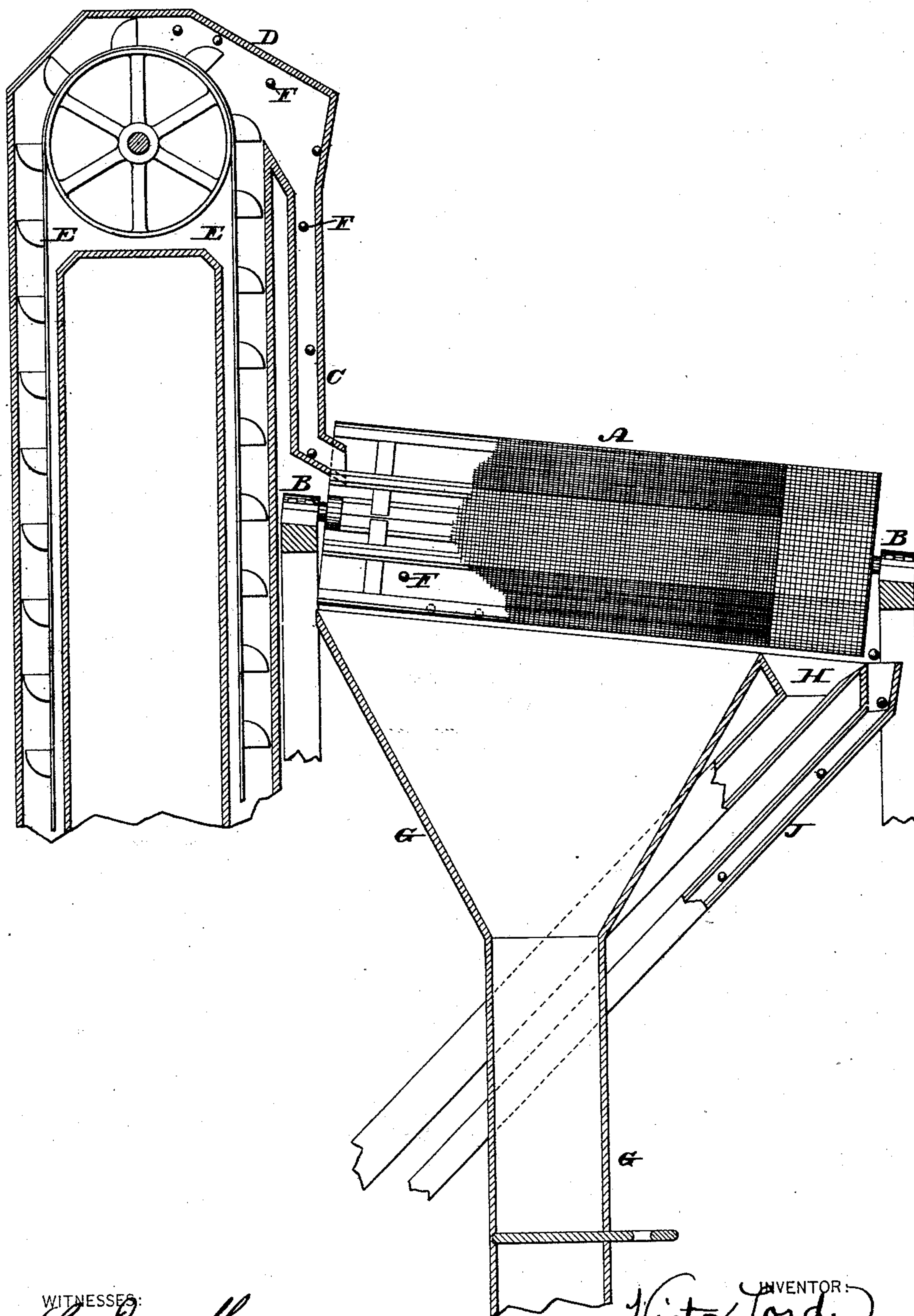
(No Model.)

V. LORD.

METHOD OF PREPARING PHOSPHATE ROCK FOR FERTILIZERS.

No. 371,083.

Patented Oct. 4, 1887.



WITNESSES:

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METHOD OF PREPARING PHOSPHATE ROCK FOR FERTILIZERS.

SPECIFICATION forming part of Letters Patent No. 371,083, dated October 4, 1887.

Application filed December 3, 1885. Serial No. 184,576. (No model.)

To all whom it may concern:

Be it known that I, VICTOR LORD, a citizen of the United States, residing at Odessa, in the county of New Castle, State of Delaware, have
5 invented a new and useful Improvement in the Method of Preparing Phosphate Rock for Fertilizers, which improvement is fully set forth in the following specification and accompanying drawing, in which the figure is a partial side elevation and partial vertical section
10 of mechanism for carrying out my invention, which is a new and improved method of preparing phosphates for fertilizers; and it consists in, first, grinding the rock; second, in passing
15 through the material thus ground, while in transit from the mill to the bolt and while in the bolt, balls of a durable nature, and, third, in treating the bolted material to the proper acids.

20 Referring to the drawing, A represents a bolt which is mounted upon suitable supports, B, and has its periphery formed of different-sized meshes or grades of screening material for the separate passage of the fine material
25 and tailings, the bolt being open at both ends.

C represents a spout which leads into one end of the bolt, and is in communication with an elevating-chamber, D, the elevator E
30 whereof is suitably operated and directs the ground material from a source of supply to the spout C, where it is fed to the bolt.

F represents balls or weights formed of lead or other durable material, the weight thereof being relatively greater than that of the material being ground, the same being placed in
35 the ground material, so as to be raised therewith by the elevator E and pass with the same through the spout C into the bolt.

Beneath the bolt are chutes G H J, the chute
40 G being designed to receive the fine material leaving the bolt, the chute H to receive the tailings from the bolt, and the chute J to receive the balls or weights F, it being noticed that the top or mouth of the chute J is adjacent
45 to the discharge end of the bolt, said end being open to permit the balls or weights to leave the bolt and drop into the said chute J.

It will be seen that when the ground material and balls or weights leave the elevator
50 and enter the spout C they are directed into the bolt.

The balls or weights, owing to their relative specific gravity, have a downward tendency in the material in addition to a forward motion with the same while passing through the
55 chute and bolt, and thus serve more thoroughly to agitate the same and thereby prevent the packing thereof, and also to permit the finer material in the upper portion of the mass to readily reach the bottom, and so escape through
60 the finer portion of the bolting-cloth, instead of being carried past the same and mixed with the tailings.

The balls or weights and tailings reach the coarse meshes or material of the bolt, and the
65 tailings escape therethrough and enter the chute H, from whence they are returned to the mill to be reground. The balls or weights finally escape at the discharge end of the bolt and enter the chute J, whereby they are re-
70 turned to the place of supply of ground material or immediately to the elevator, whereby they are again carried with the unbolted material to the spout C and bolt A, so as to render further service in the latter, the operation
75 therein being similar to that hereinbefore set forth.

I am aware that it is not new in the method of preparing flour to bolt the same and to place
80 within the said bolts or to cause to pass through the same coarse bran or crushed grain to prevent clogging of the meshes of the bolting cloth or wire; also, that elastic balls and shot have been used in connection with bolting apparatus for flour for the same purpose; but I am
85 not aware that it is common to cause, in the preparation of phosphates, balls of a durable nature to pass through the ground material while the same is passing to the bolt or while
90 in the bolt, thereby agitating the material and causing the fine powder to occupy the lower strata of the stream flowing into the bolt.

In the ordinary manner of preparing phosphates it is the practice to grind the rock as small as possible at first, the grinding-stones
95 being necessarily set close together, so as to minutely reduce the rock, and thereby prevent the presence in the ground material of comparatively large lumps of phosphate, which, being of uniform density with the mass, would
100 tend to flow along in the same strata, and thus carry to the tailings a large percentage of the

fine powder. This necessity of placing the grinding-stones close together quickly heats and destroys them.

By employing the balls of the character herein described the mass of the material passing to and through the bolt is so agitated or shaken that the finer particles are readily precipitated from the upper portion of the stream to the lower portion thereof, and are thereby readily enabled to reach the meshes of the bolting-cloth, passing through the same without being passed along over the end with the tailings, thus avoiding the necessity of again being passed to the mill and bolt.

The percentage of finer powder passed through the bolting-cloth is greater than would be the case were the balls not used, and the necessity for the grinding being so fine is to some extent obviated, whereby a saving of the grindstones is effected.

Ordinarily the pulverized rock is of different degrees of fineness, having a certain percentage which is insoluble, and therefore not capable of taking up the sulphuric acid; but by means of the improvement herein set forth it becomes practical in the art to pass the

soluble parts through the bolting-cloth, as a much finer mesh of cloth may be used, so that all the powder treated is soluble in its character, thereby enabling the same weight of powdered rock to take up more acid, and thus making an improved fertilizer. After the bolting the powdered phosphate is treated with acid in any well-known or desirable manner, the distinctive feature of my improved method being the employment of the durable balls, as and for the purpose set forth.

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

The improved method of preparing fertilizers, consisting in, first, grinding phosphate rock; second, in passing through the same, while passing from the mill to the bolt and while bolting, balls of a durable substance, and, third, in treating the rock thus bolted with the proper acids, all substantially as described.

VICTOR LORD.

Witnesses:

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