

W. F. DUNCKER.
 PHOSPHATE MILL.
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951,368.

Patented Mar. 8, 1910.

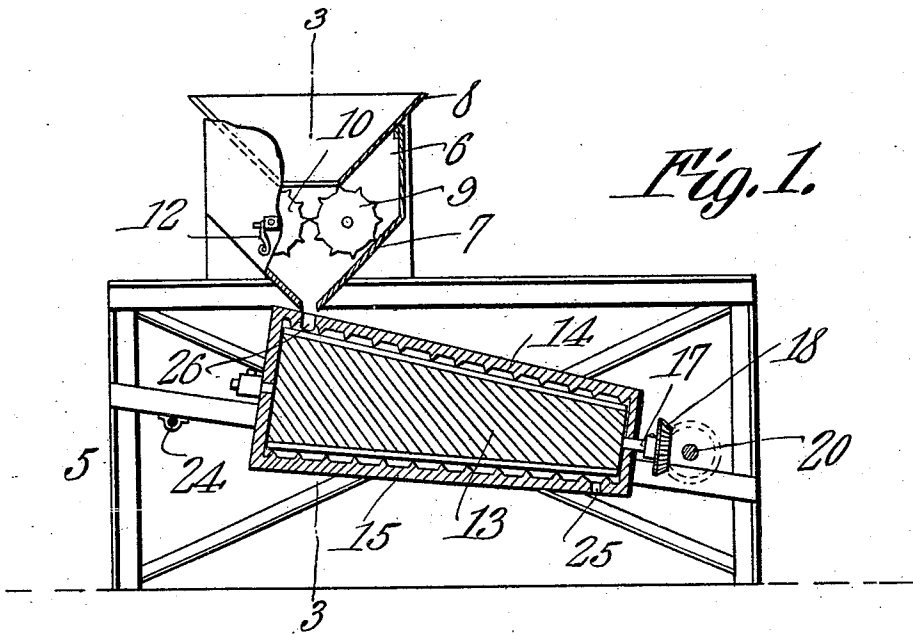


Fig. 1.

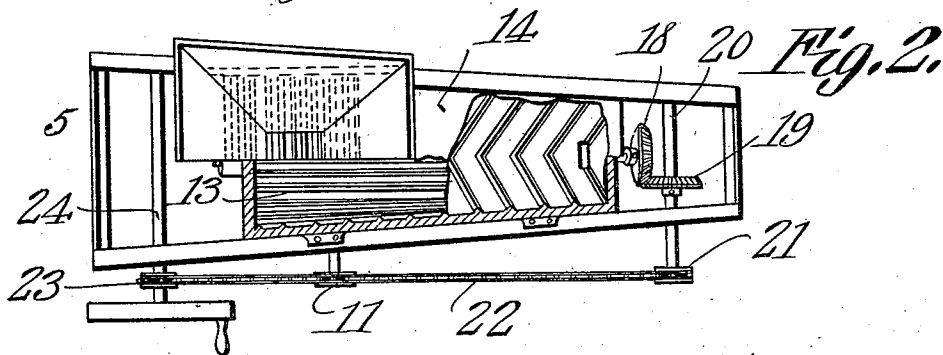
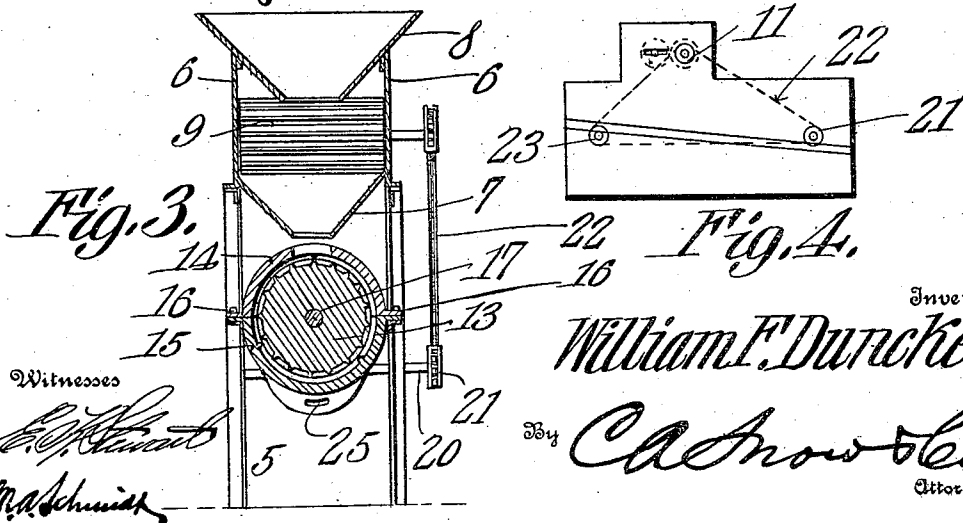


Fig. 2.



UNITED STATES PATENT OFFICE.

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PHOSPHATE-MILL.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM F. DUNCKER, a citizen of the United States, residing at Washington Boro, in the county of Lancaster and State of Pennsylvania, have invented a new and useful Phosphate-Mill, of which the following is a specification.

The present invention relates to improvements in grinding apparatus designed more particularly for grinding phosphates, although not limited to such material.

It is the object of the present invention to provide an apparatus of the kind stated embodying certain novel structural details to be hereinafter described and claimed, and also to provide an apparatus which is simple in structure, and highly efficient in operation.

The invention is illustrated in the accompanying drawing in which—

Figure 1 is a side elevation partly in section; Fig. 2 is a plan view partly in section; Fig. 3 is a transverse section on the line 3—3 of Fig. 1. Fig. 4 is a diagrammatic side elevation showing the driving gear of the apparatus.

In the drawing, 5 denotes a framework which supports the apparatus. This framework may be constructed in any desired manner to provide a support for the various parts.

On the top of the frame 5, is mounted a casing 6 having a hopper bottom 7. In the top of this casing is a receiving hopper 8. In the casing, below the discharge end of the hopper 8, is mounted a pair of corrugated crushing rollers 9 and 10, respectively. The corrugations extend lengthwise of the rollers and parallel to their longitudinal axis, the corrugations of the respective rollers being so located that their points come together when the rollers are in operation. The shafts of the rollers are mounted in suitable bearings on the side walls of the casing 6. On the shaft of the roller 9 is a sprocket wheel 11. The roller 10 is slidably mounted in its bearings toward and from the roller 9, springs 12 being provided for pressing said roller 10 in the direction of the roller 9.

The framework 5 supports a casing which contains a corrugated grinding roller 13, this roller being conical in form. The corrugations extend lengthwise and parallel to the longitudinal axis of the roller. The casing is divided longitudinally at its horizon-

tal center, the two sections being indicated at 14 and 15 respectively. At the free edges of the casing sections are outstanding flanges 16 which are bolted or otherwise secured together and these flanges also serve to secure the casing to the framework. The casing of the grinding roller is also conical in form, the inner surface being concentric with said roller. In the end walls of the casing are bearings in which the shaft 17 of the roller is journaled, and on the outside of the casing, the said shaft is fitted with a bevel gear 18 meshing with a similar gear 19 on a shaft 20 supported in the bearings on the framework 5. On the shaft 20 is a sprocket wheel 21 over which a sprocket chain 22 passes. This sprocket chain also passes over the sprocket wheel 11, and over a sprocket wheel 23 on the main drive shaft 24 of the apparatus.

The interior surfaces of the grinder casing sections are corrugated. Each section has two sets of corrugations which are joined at and extend obliquely from the longitudinal centers of the sections, and run in opposite directions in straight lines and in parallelism to the longitudinal edges of the section. The casing is inclined in the direction of its discharge end, which is the smaller end, there being an opening 25 in the bottom section 15 of the casing at this end, through which opening the ground material is discharged. The inlet to the grinder casing is at the opposite, or larger end thereof, there being an inlet opening 26 in the top section 14 of the casing. This inlet opening is located directly under the discharge end of the hopper bottom 7. The corrugations of the grinder casing sections run from the longitudinal centers of the sections and the corrugations of the respective sections diverge in the direction of the discharge end of the casing.

In operation, the material is thrown into the hopper 8 from which it passes to the crushing rollers 9 and 10 between which it is crushed, and then drops into the hopper bottom 7, and is conducted to the casing of the grinding roller 13, it entering the same through the opening 26. The material is ground between the roller and the corrugated inner wall of the casing, and is discharged from the opening 25. By arranging the corrugations of the grinder casing in the manner herein described, the grinding action is expedited, the material being rap-

idly ground to the desired degree of fineness.

What is claimed is:—

5 In a grinding apparatus, a casing having an inlet and an outlet, and tapered in the direction of its outlet end, the inner surface of the casing being corrugated, and said casing being in two sections, each section having two sets of corrugations consisting of
10 parallel ribs joined at and extending obliquely from the longitudinal centers of the sections in straight lines to the longitudinal

edges of the sections, the ribs of the respective sets diverging in the direction of the discharge end of the casing, and a longitudinally corrugated grinding roller working in the casing.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WM. F. DUNCKER.

Witnesses:

C. E. DOYLE,
GEO. B. PITTS.