

(No Model.)

J. F. WINCHELL.

## CRUSHING AND GRINDING MILL.

No. 359,588.

Patented Mar. 15, 1887.

Fig 1.

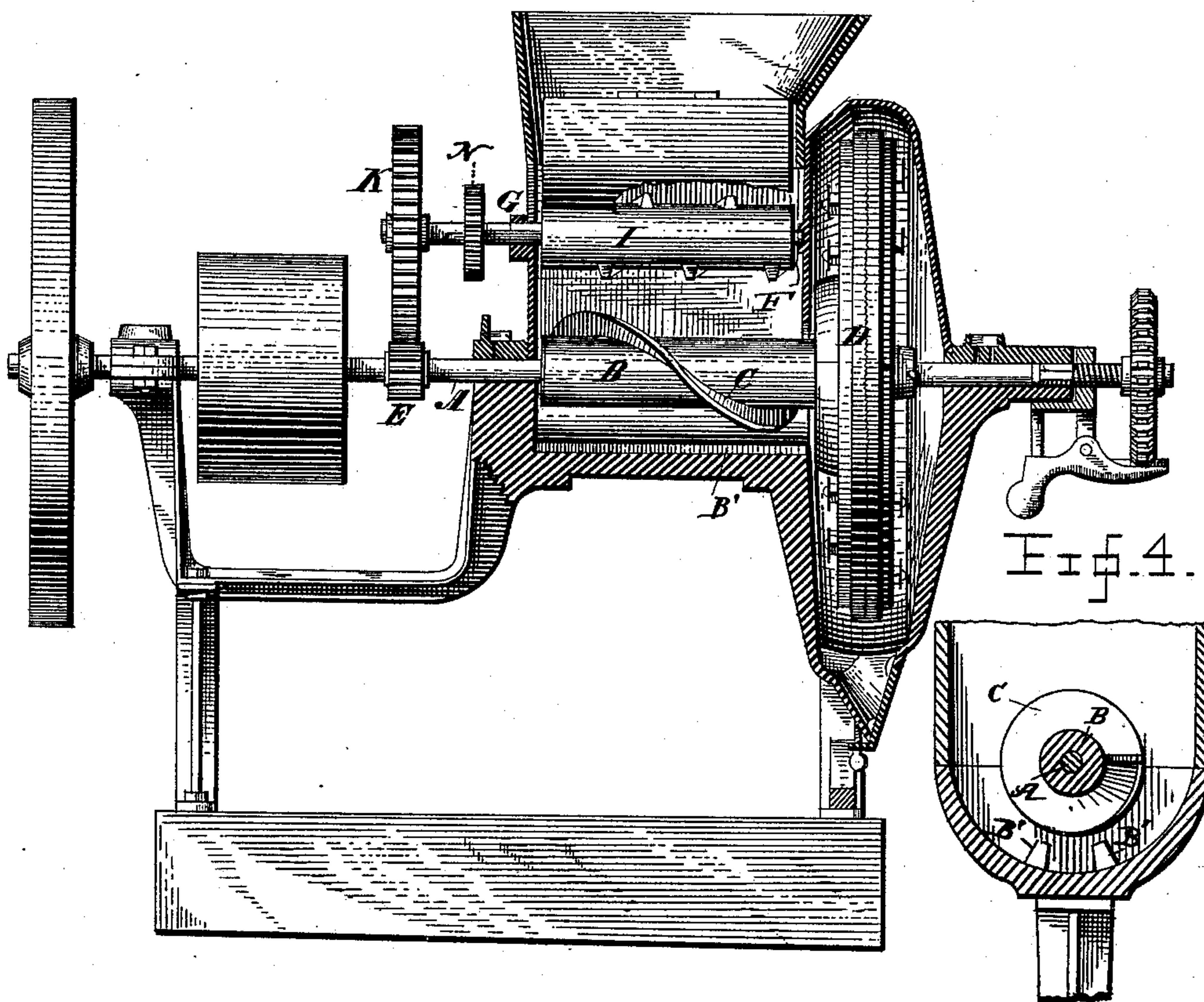


Fig. 2.

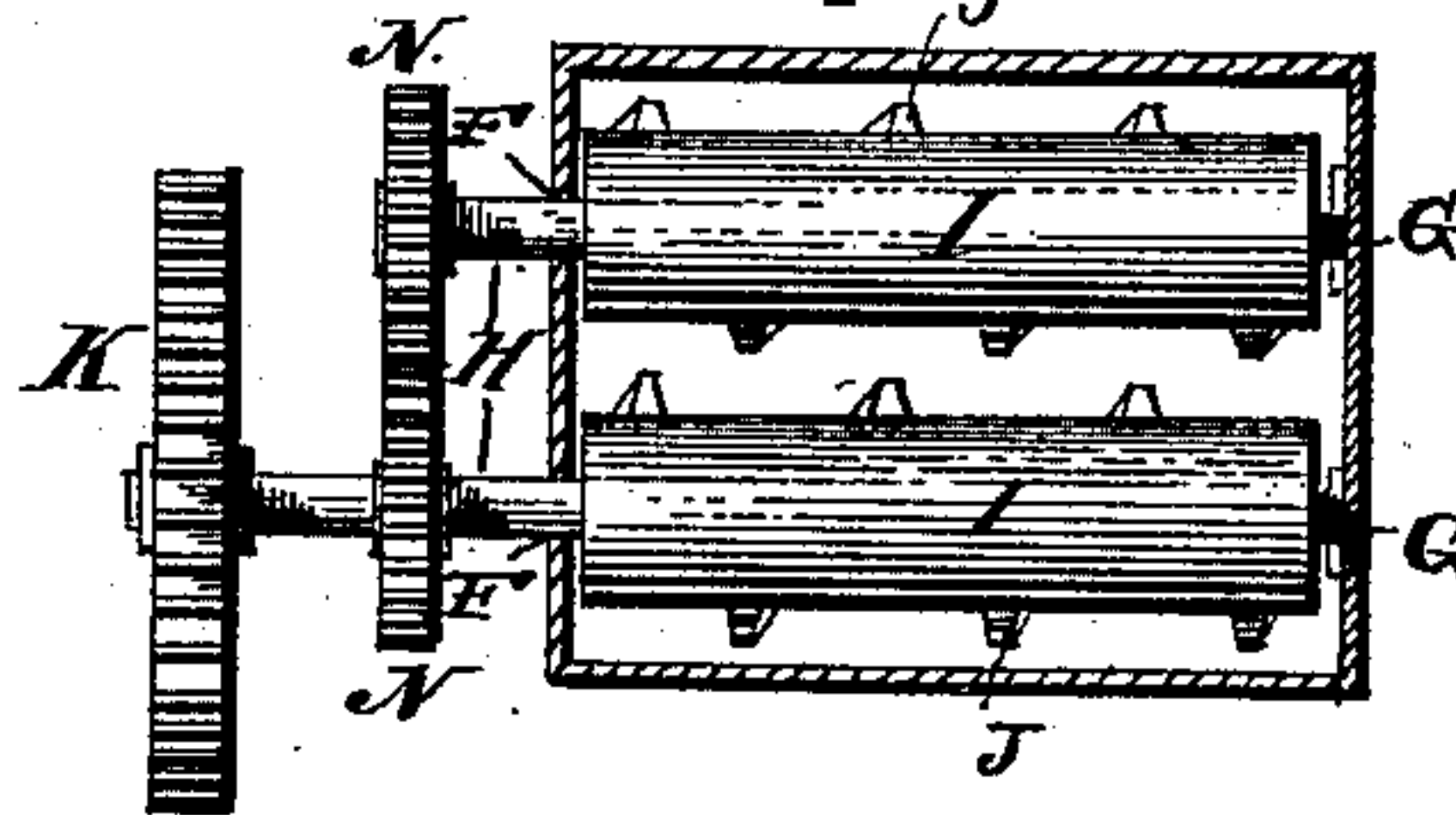
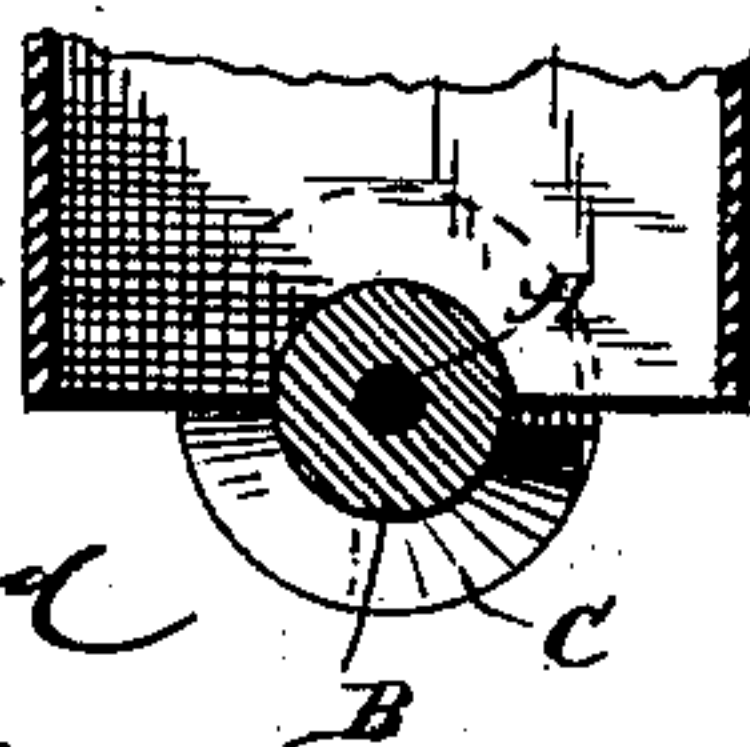


Fig. 3.



**WITNESSES.**

Edwin S Bradford

***INVENTOR***

INVENTOR  
*James F. Winchell.*

By Pauline J. Gemmes,  
his Attorney.



# UNITED STATES PATENT OFFICE.

JAMES F. WINCHELL, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE FOOS  
MANUFACTURING COMPANY, OF SAME PLACE.

## CRUSHING AND GRINDING MILL.

SPECIFICATION forming part of Letters Patent No. 359,588, dated March 15, 1887.

Application filed November 16, 1885. Serial No. 182,953. (No model).

*To all whom it may concern:*

Be it known that I, JAMES F. WINCHELL, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Crushing and Grinding Mills, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in crushing and grinding mills for reducing corn-cobs, roots, bark, bones, and the like substances, first, to a broken state, and, secondly, to a granular or finer state.

15 In the accompanying drawings, forming a part of this specification, and on which similar letters of reference indicate the same or corresponding features, Figure 1 represents a vertical sectional view of a mill of the character forming the subject of an application already filed by me, to which reference will hereinafter be made, showing my present improvement applied thereto; Fig. 2, a plan view of the crushers mounted in the upper portion of the casing, the latter being in horizontal section; Fig. 3, a transverse sectional view of the conveyer and of a part of the upper portion of the casing, and Fig. 4 a transverse sectional view of the conveyer, of the crushing-chamber, and of a part of the upper portion of the casing.

25 The machine illustrated in Fig. 1 is constructed substantially in accordance with the machine forming the subject-matter of Letters Patent granted to me May 18, 1886, No. 342,311, and May 18, 1886, No. 342,158, for improvements in crushing and grinding mills.

35 The letter A designates the main shaft of the machine, on which is rigidly mounted a roller or cylinder, B, constructed with a suitable conveyer, flange, or worm, C, for the purpose of feeding the crushed material to the grinding-heads D, which receive and act upon it in the manner disclosed in the patents above alluded to.

45 The chamber in which the conveyer works is provided with longitudinal ribs B', and the distance between the periphery of the conveyer and the sides of the chamber, as seen in Fig. 4, is greater than the distance between the said periphery and the said ribs. The result of this construction is to cause the material to

feed more rapidly to the conveyer, while the presence of said ribs enables the conveyer to further reduce or crush the material before it reaches the grinders proper.

55 It frequently happens that lumps too large to go directly to the grinders escape the upper crushers; but this further crushing action of the conveyer and ribbed chamber brings all the material to a proper size.

60 The hopper and the flap alluded to in my said patents are also preferably employed in connection with the present crusher and the hopper mounted upon the upper portion of the casing.

65 In suitable bearings, F and G, in the upper portion of the casing of the machine, I mount two crushers, I, side by side, each having crushing protuberances J. The crushers are sufficiently near to each other to cause the crushing protuberances of the respective crushers to stand either in line with each other, as seen in Fig. 2, or to lap each other, or to not quite reach each other.

75 The shafts of the crushers are provided with pinions N, which mesh with each other, and are preferably of the same diameter, while the shaft of one of the crushers is additionally provided with a gear-wheel, K, whereby rotary motion is imparted to both crushers by a pinion, E, which meshes with the gear-wheel K. The use of two crushers is especially intended for breaking up or crushing cotton-seed-meal cakes, though it is found that the two crushers are not in any sense limited in their usefulness to acting upon cotton-seed-meal cakes, since they effect the reduction of bones, bark, roots, &c., with equal facility.

85 I would here observe that I have in view the combining of two crushers with a moving conveyer (as distinguished from a mere incline) and suitable grinders.

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

1. In a mill, the combination, with a main shaft and grinders and a moving conveyer, of a plurality of intergeared crushers mounted to crush the material for the conveyer and having protuberances which extend approximately in line with each other, one of said crushers being geared with the main shaft.

2. In a mill, the combination, with the main shaft and the grinders, the moving conveyer, and a pinion mounted upon the main shaft, of two intergeared crushers mounted above the conveyer and having protuberances which extend approximately in line with each other, one of said crushers having a gear-wheel which meshes with the said pinion.

3. In a mill, the combination, with the main shaft, the grinding-heads, the moving conveyer, and the pinion, the conveyer and one of the heads being mounted upon the shaft, of two

intergeared crushers mounted above the conveyer and having protuberances which extend approximately in line with each other, one of said crushers having a gear-wheel which meshes with said pinion.

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

JAMES F. WINCHELL.

Witnesses:

A. A. YEATMAN,  
EDWIN L. BRADFORD.