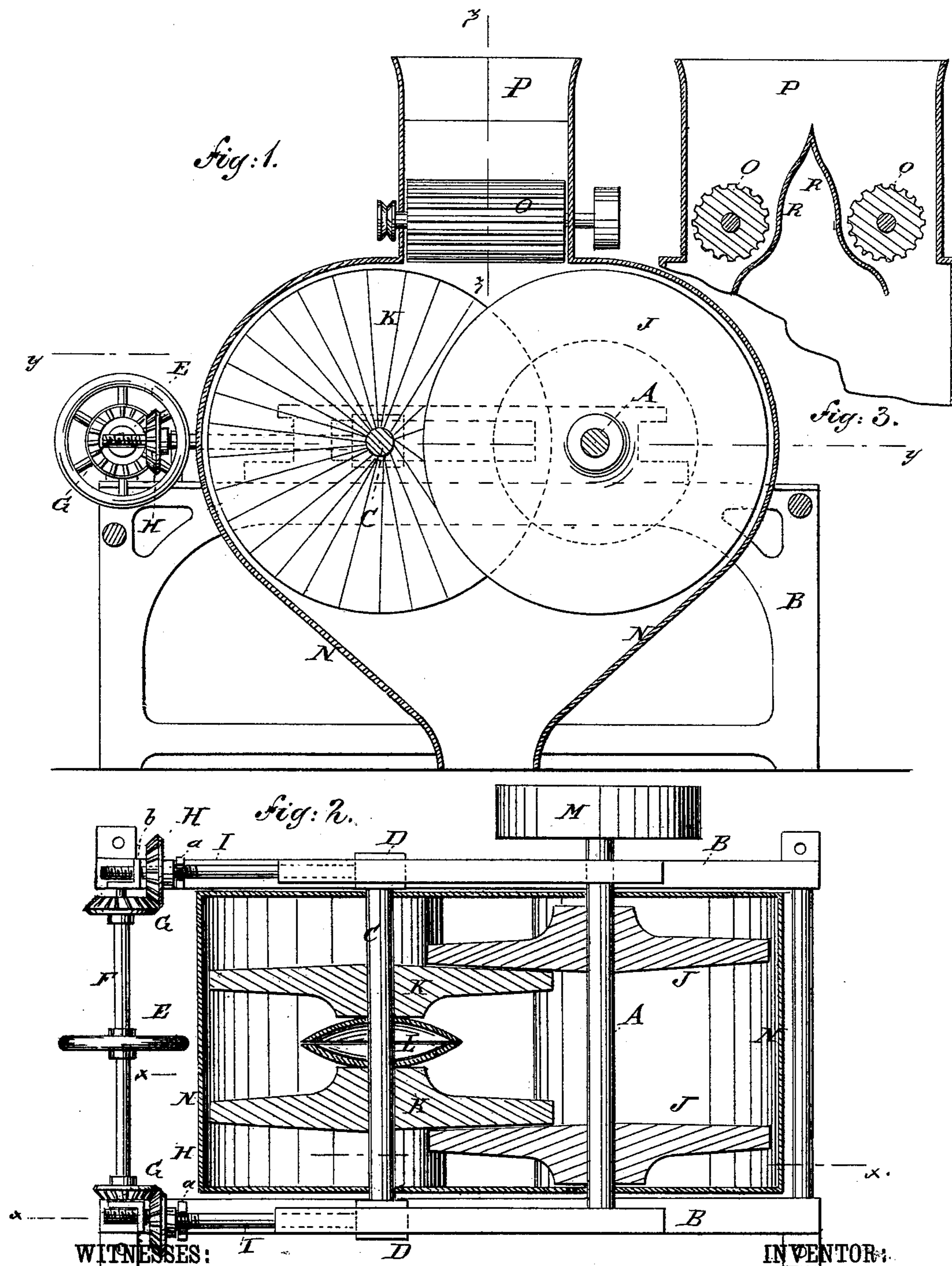


(Model.)

C. FINK.  
Vertical Disk Mill.

No. 233,495.

Patented Oct. 19, 1880.



WITNESSES:

*Chas. Nida*  
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# UNITED STATES PATENT OFFICE.

CARL FINK, OF BERLIN, GERMANY, ASSIGNOR TO ROBERT KUEHNERT, OF CINCINNATI, OHIO.

## VERTICAL-DISK MILL.

SPECIFICATION forming part of Letters Patent No. 233,495, dated October 19, 1880.

Application filed May 7, 1880. (Model.) Patented in Germany August 22, 1877, and December 6, 1877.

*To all whom it may concern:*

Be it known that I, CARL FINK, of Berlin, Germany, have invented a new and Improved Vertical-Disk Mill, of which the following is a specification.

The object of my invention is to provide a new and improved disk-mill for crushing and grinding different materials, which is simple in construction and effective in use.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation on the line *x x*, Fig. 2, of my improved disk-mill. Fig. 2 is a horizontal sectional view of the same on the line *y y*, Fig. 1; and Fig. 3 is a horizontal sectional elevation on line *z z*, Fig. 1, of the funnel of my improved disk-mill.

Similar letters of reference indicate corresponding parts.

The shaft A is journaled in the mill-standard B, and a shaft, C, is journaled in the sliding journal D, which can be moved forward or backward by means of a hand-wheel, E, on a shaft, F, provided at the ends with bevel-gear wheels G, acting upon bevel-gear wheels or nuts H, through which the threaded ends of the rods I, attached to the sliding journals D, pass.

The geared wheels or nuts H are held in position by a notched lug, *a*, and a perforated lug, *b*, which also serve as a bearing for the front end of the rod I, so that if the hand-wheel E is rotated the journals D will move forward or backward.

Two slightly-conoidal-faced disks, J J, are rigidly mounted on the shaft A, with their conical sides facing each other, and two like conical disks, K K, of the same size, are loosely mounted on the shaft C, their conical sides facing in the opposite direction to that of the conical sides of disks J J. The distance from the shaft A to the shaft C is slightly greater than the radius of the disks.

A spring-cushion, L, formed of two concave steel plates, is placed between the disks K K, or any other suitable spring-cushion may be substituted for the same.

The disks K K are placed between the disks J J, as shown in Fig. 2, and as the spring-cushion L presses the disks K against the rigidly-mounted disks J the friction produced

will be sufficient to rotate the former in case the latter are rotated, which is accomplished by means of a belt passing over the pulley M on the shaft A.

The disks and shaft are surrounded by a suitable casing, N, in which the crushed material collects, and can be removed when necessary.

A funnel, P, in which two parallel-fluted rollers, O O, are horizontally pivoted, is mounted on the top of the casing N. The rollers are both rotated by means of a suitable pulley, and thus gradually feed in the material, which slides down the double-curved incline R in between each pair of disks.

The disks may be made of any desired material, preferably chilled iron, and are provided with a series of fine radial or other grooves.

The operation is as follows: According to the nature of the material to be crushed, the friction between the two adjoining disks must be varied, which is accomplished by means of the hand-wheel E, for by turning this wheel toward the interior of the mill the sliding journals D are pushed inward, and the pressure of the disks upon each other is greatly augmented. If the mill has been adjusted, power is applied to the shaft A and the operation begins. As the disks are conical the space between them will be at its minimum on the horizontal line passing through the centers of each pair of disks, and the said space will increase in width toward the top and bottom, so that the material is gradually crushed until it reaches the horizontal line connecting the centers of the disks. From this line downward the space between the disks widens, and the crushed material drops to the bottom of the casing N, and can be removed when desired.

The within-described apparatus operates much more rapidly and easily than vertical millstones or ordinary crushing-mills, and the disks can be cooled in a more efficient manner than the stones or rollers of ordinary mills.

I do not limit myself to this particular construction of the mill, but may arrange only one pair of disks, both being rigidly mounted on their shafts, or I may arrange more than two pairs of disks in one casing.

Instead of driving the second shaft by means of the friction of the disks upon each other, friction wheels or gearing may be used for this purpose.

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

The combination, in a disk-mill, of the shaft A, journaled in standard B and carrying the conoidal-faced disks J, the shaft C, journaled  
10 in the sliding journal-bearing D and carrying

the yielding conoidal-faced disks K, the shaft F, having median wheel E and at its ends beveled-gear wheels G, and the end-threaded rods I, carrying bevel-gear nuts H, as and for the purpose specified.

CARL FINK.

Witnesses:

HERMANN WEDDING,  
W. HERRING.