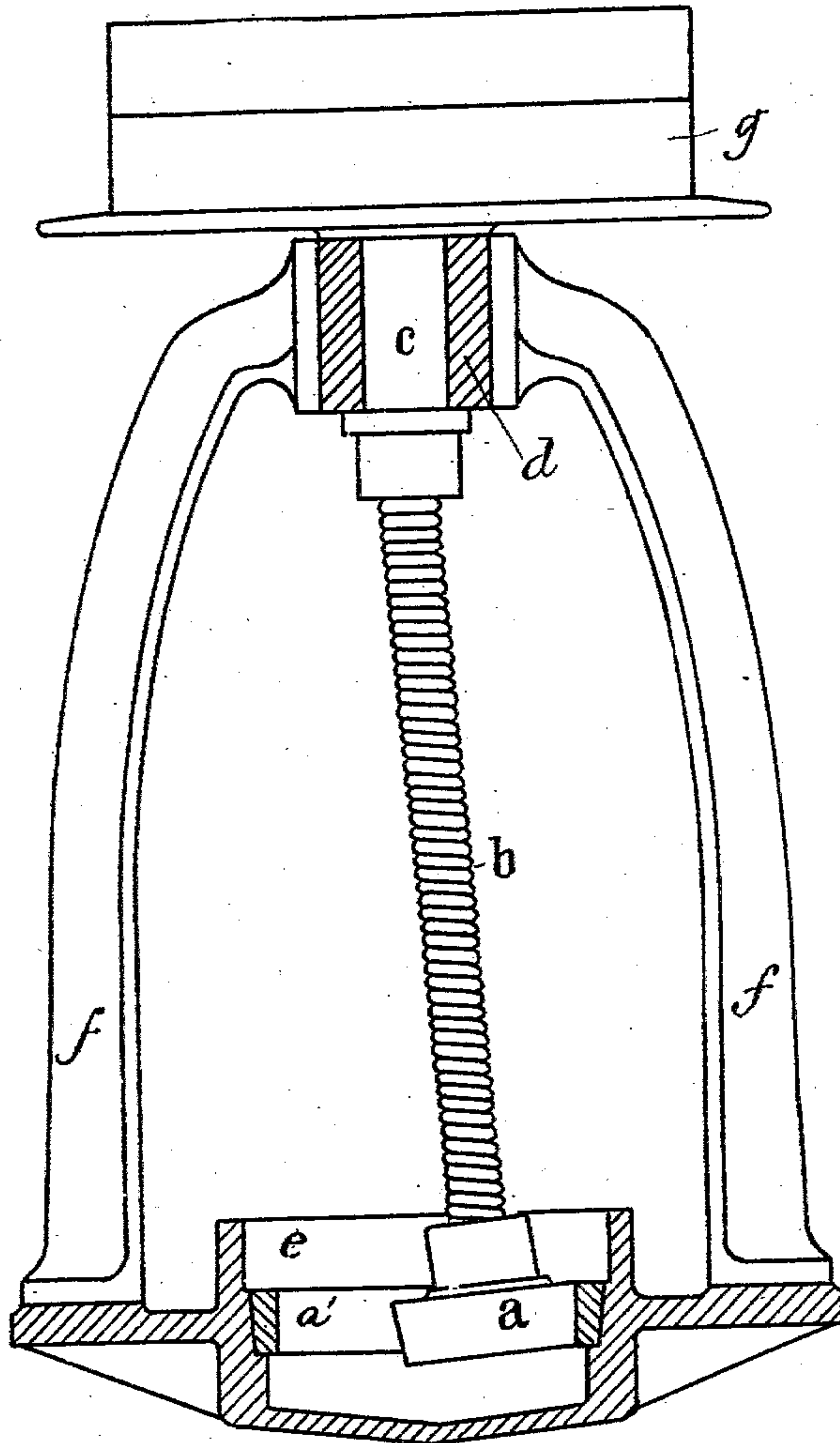


No. 715,473.

Patented Dec. 9, 1902.

O. GAISER.  
CENTRIFUGAL MILL.  
(Application filed Apr. 24, 1901.)

(Model.)



Witnesses:  
Anton A. Gletzer  
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# UNITED STATES PATENT OFFICE.

OTTO GAISER, OF KEMPTON, GERMANY.

## CENTRIFUGAL MILL.

SPECIFICATION forming part of Letters Patent No. 715,473, dated December 9, 1902.

Application filed April 24, 1901. Serial No. 57,273. (Model.)

*To all whom it may concern:*

Be it known that I, OTTO GAISER, a citizen of Germany, residing at Kempton, Bavaria, Germany, have invented certain new and useful Improvements in Centrifugal Mills; and I do hereby 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.

This present invention relates to mills; and its object is to provide a flexible support for a mill-roll whereby the same is caused to bear against and travel over the inner periphery of a counter grinding-surface when the mill is in operation and to recede from such contact when the same is at rest. For this purpose my invention consists in the features now to be described, and particularly pointed out in the claims.

Reference is made to the accompanying drawing, which represents a vertical longitudinal section of a mill embodying my invention.

In the drawing, *a* represents a mill-roll which in operation impinges against and travels over the inner periphery of the annular grinding-bed *a'*. This mill-roll *a* is suspended from the concentric journal *c*, mounted in a suitable bearing *d* above the annular bed *a'* by a yielding support *b*, having the form of a flexible shaft, which may be a metal spring-coil, as shown. As shown, the journal-bearing *d* is supported over the grinding-bed support or base *e* by the standards *f*.

To impart rotary motion to the journal *c*, the same is secured firmly to a pulley *g*, to which motion is transmitted in any suitable or convenient way from a source of power. When the journal *c* revolves, the lower portion of the flexible shaft *b* is impelled outward, and with it the mill-roll *a*, whereby the same is caused by centrifugal force to bear against and travel over the surface of the annular bed *a'*, as will be readily understood. When at rest, the roll *a* returns to its dormant central position out of contact with the annulus *a'*. The flexible support or shaft *b* allows the roll *a* to yield to any unevenness occurring under the grinding operation, whereby shocks and jars are greatly reduced.

I am aware that it is old to mount a mill-

roll upon a shaft which is connected to its rotary journal by a universal joint or other flexible connection and also that it is old to have the mill-roll mounted upon a shaft which is rotatable in a flexible bearing; but in both these cases the shafts or supports for the rolls are rigid, whereas in my construction I avoid the universal-joint connection and the flexible bearing by making the shaft itself flexible. I am also aware that it is old to provide a grinding-mill in which the roller is mounted yieldingly from a rigid shaft, so as to enable it to be deflected by pieces of material which it cannot crush, thereby avoiding the strain on the driving-shaft and the danger of breakage. My construction, however, differs from this in having a long flexible shaft whose bearing is concentric with the annulus or annular grinding-bed, whereby the roller does its crushing by centrifugal force and not by pressure applied from the rigid shaft. Hence by my device the pressure on the roller against the grinding-bed does not cause any shear action on the spring.

In employing the term "mill-roll" I use the word "roll" in its generally accepted meaning as broadly specifying the body between which and the bed crushing is effected, whether by rolling pressure or grinding action, and I do not intend to define said element as a body having a rolling motion over the surface of the annular bed, as, in fact, the roll used by me has a fixed relation to the flexible shaft and a grinding frictional contact with the body.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a mill, the combination with an annular bed, of a relatively long flexible shaft supported concentrically above said annular bed, a mill-roll upon the end of the flexible shaft and arranged to contact with the inner surface of the annular bed when the shaft swings from its vertical position, and means for rotating said shaft.

2. In a centrifugal mill, the combination, with an annular bed, a journal located above the annular bed and concentric therewith, and means for rotating said journal, of a relatively long shaft flexible throughout its length and secured to the journal, and a mill-roll upon the end of the flexible shaft and



arranged to travel over and in contact with the annular bed when the journal is in rotation.

3. In a centrifugal mill, the combination  
5 with an annular bed, a journal located above and substantially concentric therewith, and means for rotating said journal, of a relatively long shaft formed of a spiral spring, a mill-  
10 roll upon the end of the shaft arranged to travel over and in frictional contact with the annular bed when the journal is rotated and to automatically leave said annular bed when the journal ceases to rotate.

4. In a centrifugal mill, the combination  
15 with an annular bed, a journal located above

the annular bed and concentric therewith, and means for rotating said journal, of a relatively long shaft flexible throughout its length and formed of a spiral spring, a mill-roll upon the end of the flexible shaft and arranged to  
20 travel over and in frictional contact with the annular bed when the journal is rotated and to automatically leave said annular bed when the journal ceases to rotate.

In testimony whereof I affix my signature 25  
in presence of two witnesses.

OTTO GAISER.

Witnesses:

RUDOLPH W. HIEBL,  
CHAS. KAMMERER.