2 Sheets—Sheet 1.

G. & A. RAYMOND.

Grinding Mill.

No. 237,320. **Patented Feb. 1, 1881.**

Fig. 1.

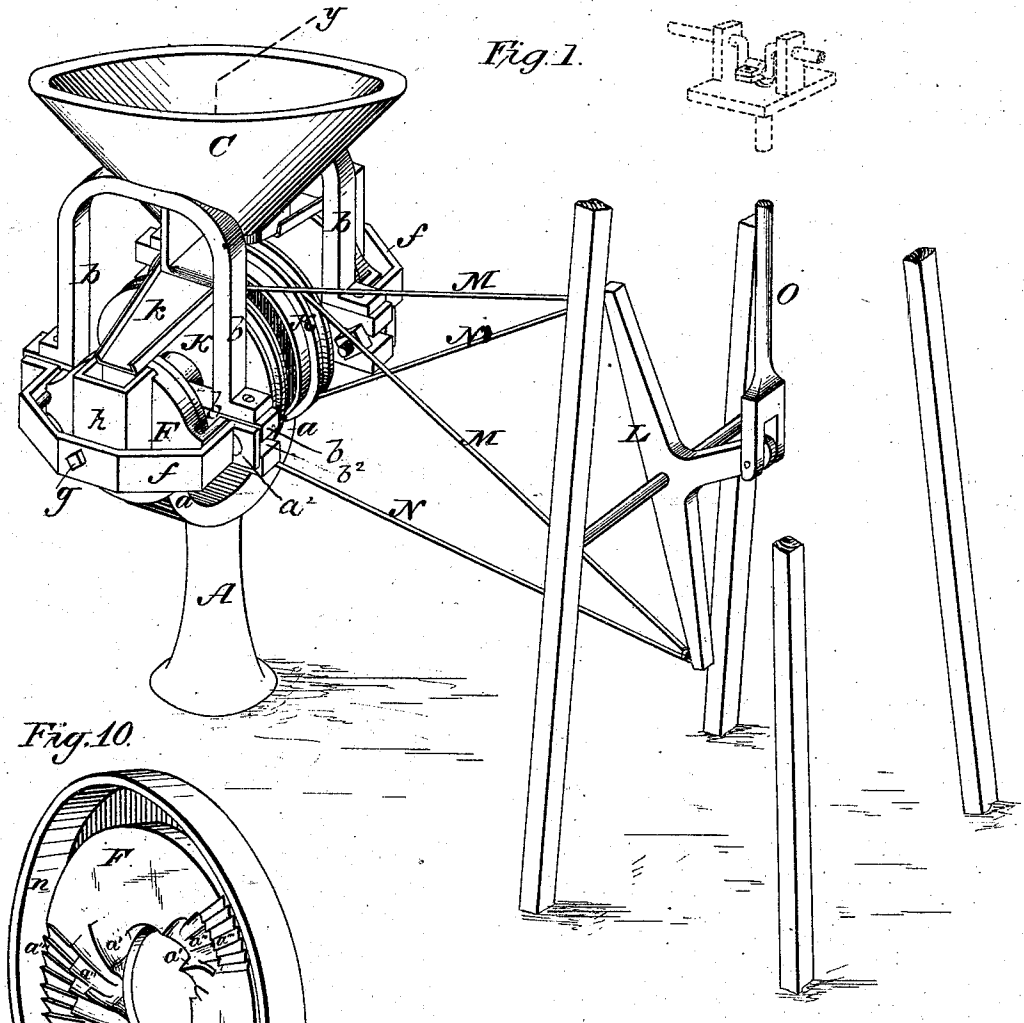


Fig. 10.

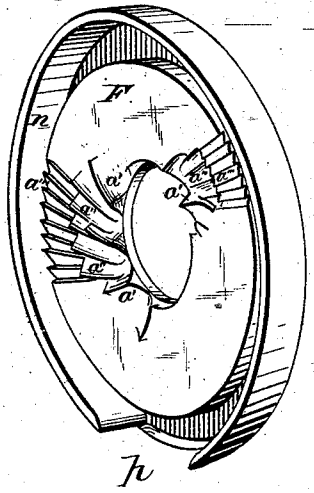
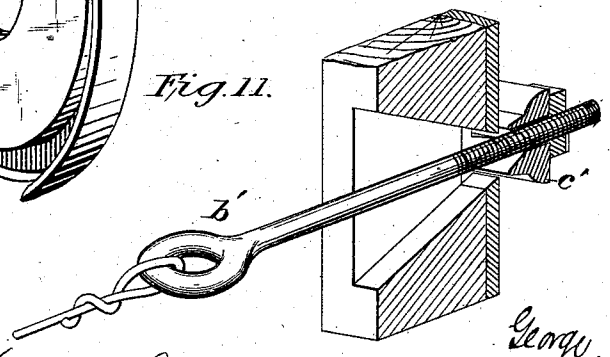


Fig. 11.



Witnesses.

Sidney P. Hollingsworth

William N. Dodge.

Inventor.

George Raymond

Albert Raymond

By Dodger & Son

attys.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

2 Sheets—Sheet 2.

G. & A. RAYMOND.

Grinding Mill.

No. 237,320. Patented Feb. 1, 1881.

Fig. 2.

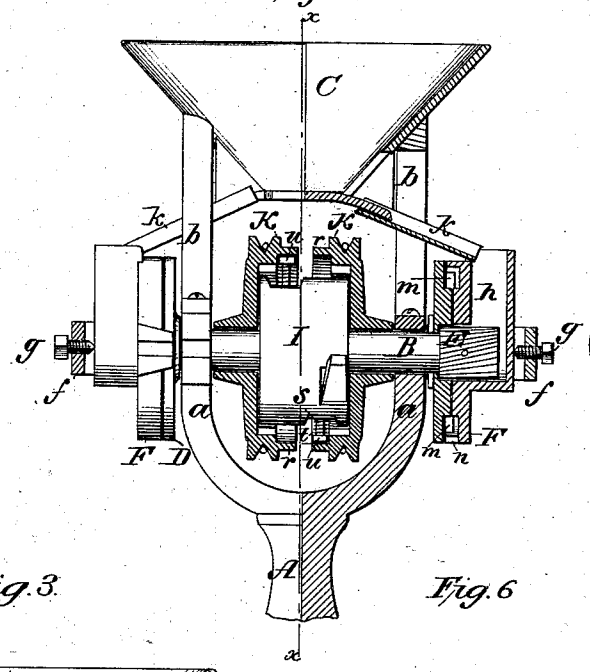


Fig. 4.

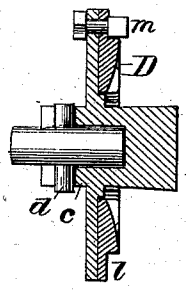


Fig. 5.

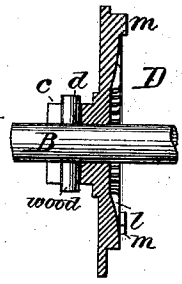


Fig. 3.

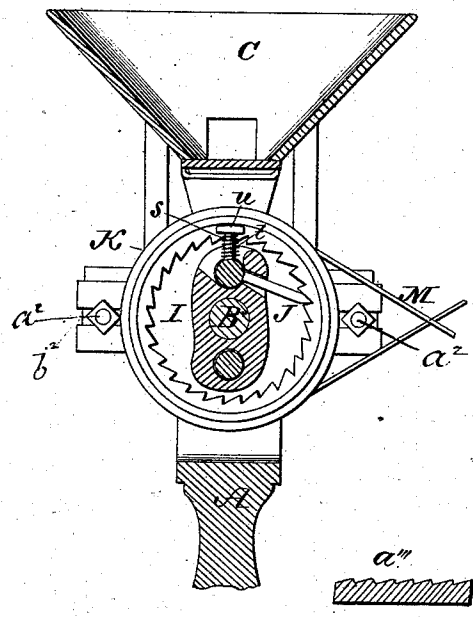


Fig. 6

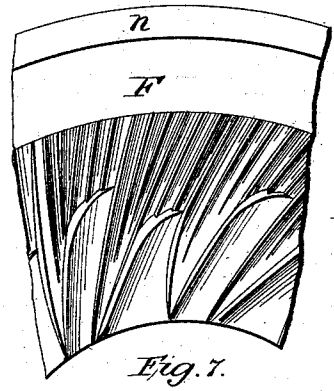


Fig. 7.

Fig. 8.

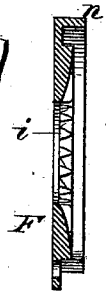
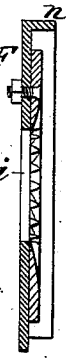
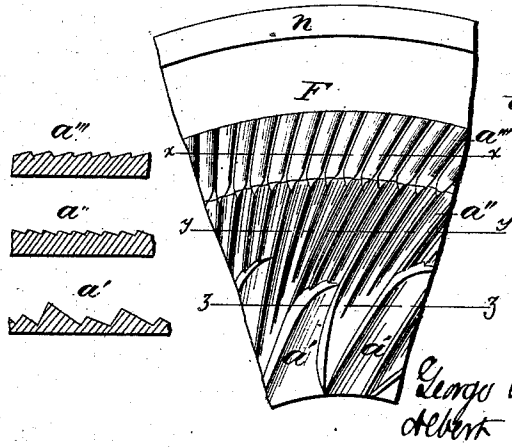


Fig. 9.





Witnesses.

Sidney D. Hollingsworth

William W. Dodge.

Inventor.

George Raymond

Albert Raymond

By Dodge & Son

attys.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGE RAYMOND AND ALBERT RAYMOND, OF CHESTER, WISCONSIN.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 237,320, dated February 1, 1881.

Application filed December 31, 1879.

To all whom it may concern:

Be it known that we, GEORGE RAYMOND and ALBERT RAYMOND, of Chester, in the county of Dodge and State of Wisconsin, have invented certain Improvements in Grinding-Mills, of which the following is a specification.

This invention relates more particularly to that class of mills in which vertical metallic grinding-disks are employed.

The invention consists in the combination of the driving-shaft, grinding or reducing devices having an exposed hub or bearing, and a safety-pin connecting said parts, and in minor details.

Figure 1 represents a perspective view of our mill and the attachments for driving the same from a wind-wheel. Fig. 2 is a front elevation of the same with one side shown in section through the center. Fig. 3 is a vertical section on the line *x x*, Fig. 2. Figs. 4 and 5 are central cross-sections through the rotary grinding-disk, illustrating two arrangements of the safety-pin. Figs. 6, 7, 8, 9, and 10 are views showing the construction of the grinding-disks; Fig. 11, a view showing one of the details of the driving mechanism.

A represents a rigid base or standard, the upper end of which divides into two vertical arms, *a*, the upper ends of which form bearings for the horizontal driving-shaft B. The ends of the shaft are held down in the bearings by plates *b*, which are made with upright arms to sustain the feed-hopper C. Each end of the shaft, outside of its bearing, is provided with a vertical grinding-disk, D, secured thereto in the manner hereinafter described. Outside of and facing each disk D there is a corresponding fixed grinding-disk, F, sustained at its opposite sides or edges on horizontal guides or ribs on the inside of the yoke or bar *f*, which is bolted at its ends to the frame and extended outward around the disks, as shown. As shown in the drawings, the bolts a^2, which hold the yoke, are passed through slots b^2 in the frame. For the purpose of holding and forcing the outer disk inward a screw, *g*, is inserted through the yoke *f*, and seated in a depression in the back of the feed-passage *h* on the back of and in line with the center of the disk, which is free to tip and rock thereon.

In order to prevent injury to the mill in the event of the entrance of metal, stone, or other refractory foreign matter, the rotary disk is provided on its back with an exposed notched hub, *c*, and is secured to the shaft by means of a wooden pin, *d*, which is passed through the shaft and seated at its ends in the hub, as clearly shown in Figs. 2, 4, and 5. When the disk encounters any sudden or dangerous resistance the pin breaks and permits the disk to stop, while the shaft is permitted to continue its motion. The hub being exposed permits the broken pin to be readily removed and replaced by a new one. The essential feature of the invention, in this regard, consists in the use of a pin which will break or yield in connection with the exposed bearing devices therefor; and it is obvious that the form of the parts may be varied and modified without departing from the limits of our invention.

For the purpose of admitting the grain between the disks each of the stationary disks is provided with a central eye and with an outside vertical throat or passage, *h*, leading thereto. Inclined spouts or conductors *k* carry the grain from the hopper into the passages *h*, whence it passes through the eye.

As a means of imparting the rotary motion to the mill, I provide the shaft at the center with a hub, I, fixed thereon, and carrying pawls J. I also mount on the shaft two loose internally-toothed wheels, K, which engage alternately with the pawls to turn the shaft. Cords attached to and wound upon the outside of the pulleys, and passed thence to a vibrating bar, L, in the manner shown, serve to turn the wheels forward and backward alternately. The vibrating bar L will be actuated, as shown, by a pitman, O, from the crank of a wind-wheel.

In order that the wooden safety-pin may be made as weak as required without danger of their being broken by the pressure applied to the disk when grinding, the end of the driving-shaft is seated solidly in a recess in the back of the disk, so as to receive the pressure upon its end and thereby relieve the pin.

We do not claim herein the construction of the grinding-disks shown in the drawings, except as regards the hub on the back, having made the same the subject of a separate application; but

What we do claim is—

1. The combination of the shaft, the safety-pin, and the reducing devices provided with the exposed hub to co-operate with the pin, said parts being constructed, substantially as described, to permit the instantaneous removal and replacement of the pin.

2. The perforated shaft, in combination with the grinding-disk, having the hub formed directly on its back, and a wooden safety-pin passed through and readily removable from the shaft, and engaging with the hub at both ends, as shown.

GEORGE RAYMOND.
ALBERT RAYMOND.

Witnesses:
W. H. TAYLOR,
V. S. BRINKERHOFF.