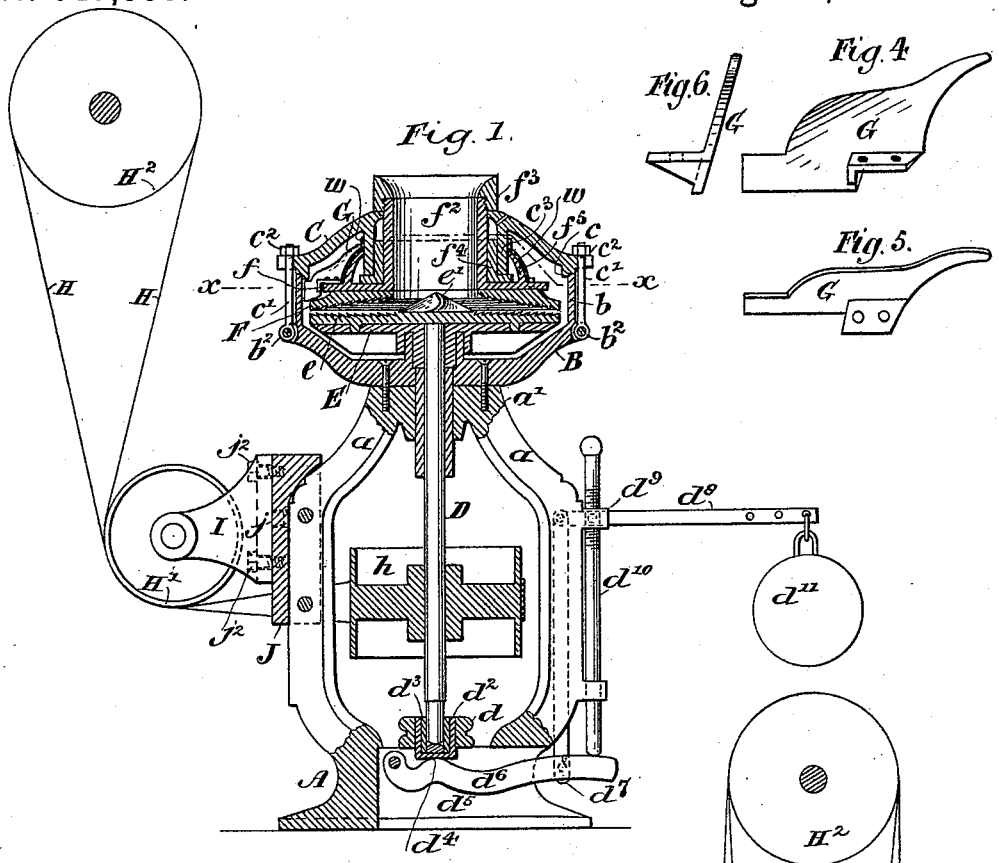
(No Model.)

G. F. SIMPSON.

GRINDING MILL.

No. 347,968. Patented Aug. 24, 1886.



Witnesses
Jas. R. Bowen
Geo. Wadman

Inventor
George F. Simpson
by his attorneys,
Gifford & Brown

UNITED STATES PATENT OFFICE.

GEORGE F. SIMPSON, OF BROOKLYN, NEW YORK.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 347,968, dated August 24, 1886.

Application filed March 5, 1886. Serial No. 194,096. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. SIMPSON, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a specification.

My improvements relate to mills employed for grinding grain and other dry materials.

I will describe in detail a mill embodying my improvements, and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is an elevation, partly in section, of a mill embodying my improvement. Fig. 2 is a horizontal section thereof, taken on the plane of the dotted line *x x*, Fig. 1. Fig. 3 is a detail view of a certain portion of the mill, partly in section, and a portion being broken away to save space. Fig. 4 is an enlarged side view of a propeller that is comprised in the mill. Fig. 5 is a top view of this propeller on the same scale as Fig. 4. Fig. 6 is an end view of the propeller on the same scale as Fig. 4.

Similar letters of reference designate corresponding parts in all the figures.

A designates the base piece of the frame of the mill, and *a* uprights extending therefrom. The base and uprights are made of cast-iron and are integral. The uprights *a* unite near their upper ends, forming a central portion, *a'*. Upon the central portion *a'* is rigidly mounted the chamber of the mill. The chamber comprises a lower dish-shaped portion, B, which is provided near its edge with an upwardly-extending circumferential flange, *b*.

C designates a cover or cap, provided upon its under side with a circumferential rabbeted flange, *c*, fitting over the flange *b* on the dish-shaped portion B. The cover C is secured to the portion B by means of bolts *c'*, which are pivotally connected near their lower ends to lugs b^2 on the portion B by means of pins passing through said lugs and the said bolts. The bolts may therefore be swung up and down. In the position shown in Fig. 1 they extend into radial slots in the periphery of the cap C, and are there held in position by means of nuts c^2. Some distance inward from the edge of the cover C the same is provided with a downwardly-extending circumferential flange or apron, c^3. The general contour of the interior of the cover C is concave.

D designates a driving-shaft, which is arranged vertically and is journaled in a step-bearing at its lower end. Said bearing is arranged centrally in the base A of the frame. It consists of a hub, *d*, forming part of the base A, and provided with a vertically-extending aperture, which will preferably be circular. Arranged within this aperture, so as to be capable of being freely moved up and down therein, is a hollow cup, d^2. A ring, d^3, preferably of steel, fits within the cup d^2 and rests at its lower end upon the bottom thereof. Within the ring d^3, and also resting upon the bottom of the cup d^2, is a button or knob, d^4, preferably of steel, and having a convex upper surface. The lower portion of the shaft D extends within the ring d^3, and the end thereof has a convex surface, which rests upon the convex surface of the knob d^4.

Within a cavity, d^5, in the base A, is arranged a lever, d^6. This lever is fulcrumed at its inner end to the walls of the cavity. Its outer end extends beyond the base A. A link, d^7, is pivotally connected near its lower end to the lever d^6 beyond the base, and at its upper end to one end of a lever, d^8. The lever d^8 is pivotally connected to one of the uprights *a* of the frame. It has a lug, d^9, provided with a screw-threaded aperture through which extends, vertically, a screw, d^{10}, the lower end of which impinges on the lever d^6. A weight, d^{11}, is hung upon the lever d^8. It may be hung in different positions thereon by moving it lengthwise. The cup d^2 rests upon the lever d^6. By adjusting the screw d^{10} the lever d^6 may be raised or lowered, thereby elevating or lowering the shaft D. The shaft D extends centrally through the portion *a'* of the frame, and bears upon its upper end a plate, E, arranged centrally thereon, and horizontally within the dish-shaped portion B. A metal plate, *e*, is bolted to the upper side of the plate E. The upper surface of the plate *e* is preferably serrated, and constitutes a grinding-surface. Spiral ribs *e'* upon the plate *e* tend to distribute material to be ground over the grinding-surface.

Above the plate *e*, and arranged eccentrically thereto, is a plate, F, provided upon its under side with a grinding-surface. When the plate *e* is rotated the plate F is rotated eccentrically above the same by the grain or

other material being ground. The plate F is arranged upon and rigidly secured to the under side of a plate, *f*, which latter plate is provided with a central opening and a vertically-extending integral chute, f^2. The chute f^2 extends through and is supported by the cover C. It is so supported by means of a circumferential flange, f^3, upon the chute which extends over the cover.

Between the chute f^2, the plate *f*, and the downwardly-extending apron c^3 on the cover C is a neutral ring, f^4. I prefer to make this ring of a composition metal—such, for instance, as brass—to lessen wearing and heating. A curved circumferential apron, f^5, on the plate *f*, prevents the ground material from coming in contact with the neutral ring, f^4. A washer of leather, *w*, fits tightly around the flange or apron c^3, and extends over the apron f^5 for the same purpose.

Bolted or otherwise secured to the upper side of the ring *f* is a propeller, G. This propeller consists of a thin piece of metal extending upwardly from the plate *f*, and more or less at an angle to radii thereof. It is also leaned over sidewise. It will be observed that it fills or nearly fills the space between the plate *f*, the apron f^5, and the cover C, and that it extends well down below the plate *f*. This propeller rotates with the plates F *f*, and it keeps the side of the chamber free from ground material which would otherwise gather there. By arranging the propeller at an angle to radii of the plate *f* and leaning it over, it forces the particles of ground material outwardly against the sides of the chamber and also downwardly. Its extreme inner end bears against the washer *w* and maintains the latter in the proper position.

Motion is imparted to the shaft D by means of a belt, H, passing around a pulley, *h*, mounted on said shaft. After leaving said pulley the belt passes around two pulleys, H′, and thence over a pulley, H^2, mounted on the usual shafting. One of the pulleys, H′, is mounted in bearings in a frame, I, and the other pulley, H′, is mounted in bearings in a similar frame, I′. The frames I I′ are arranged side by side upon a plate, J, which is bolted to one of the uprights *a* of the frame, as shown more clearly in Fig. 2. Each of the frames may be turned upon a pivot, *j*, so that the pulleys H′ will rotate relatively to the plane of rotation of the pulley *h*, in more or less angular planes to properly direct a belt when a driving-pulley is arranged as shown in Fig. 1. I have shown one of the pulleys so arranged in Fig. 3. When the pulleys have been adjusted to the desired angle the frames may be locked, so as to maintain the pulleys in such position by bolts j^2 extending through the plate J, and circularly-shaped slots in the backs of the frames. This adjustment provides a ready means for arranging the pulleys so that the belt will not slip off.

Provision is afforded by the slots *j* in the plate J for moving the frames I I′, and the pulleys H′ toward and from each other, so as to adapt the pulleys H′ for receiving a belt from a driving-pulley in the position shown in Fig. 3.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a mill, the combination, with a chamber, of upper and lower grinders, a plate upon which the upper grinder is mounted, a propeller, as G, extending upwardly from the plate, and at an angle to radii of the grinder, the same being leaned over sidewise and extending downwardly below the said plate, substantially as specified.

2. The combination, with the driving-shaft D, of the pulley *h*, the belt H, the pulleys H′, and frames I I′, in which said pulleys are journaled, the pulleys H′ being adjustable at an angle relatively to the plane of rotation of the pulley *h*, and also adjustable toward and from each other, substantially as specified.

GEO. F. SIMPSON.

Witnesses:
EDWIN H. BROWN,
JAS. R. BOWEN.