No. 730,631. PATENTED JUNE 9, 1903.

C. C. FUSMER.

GRINDING MILL.

APPLICATION FILED JULY 6, 1900.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

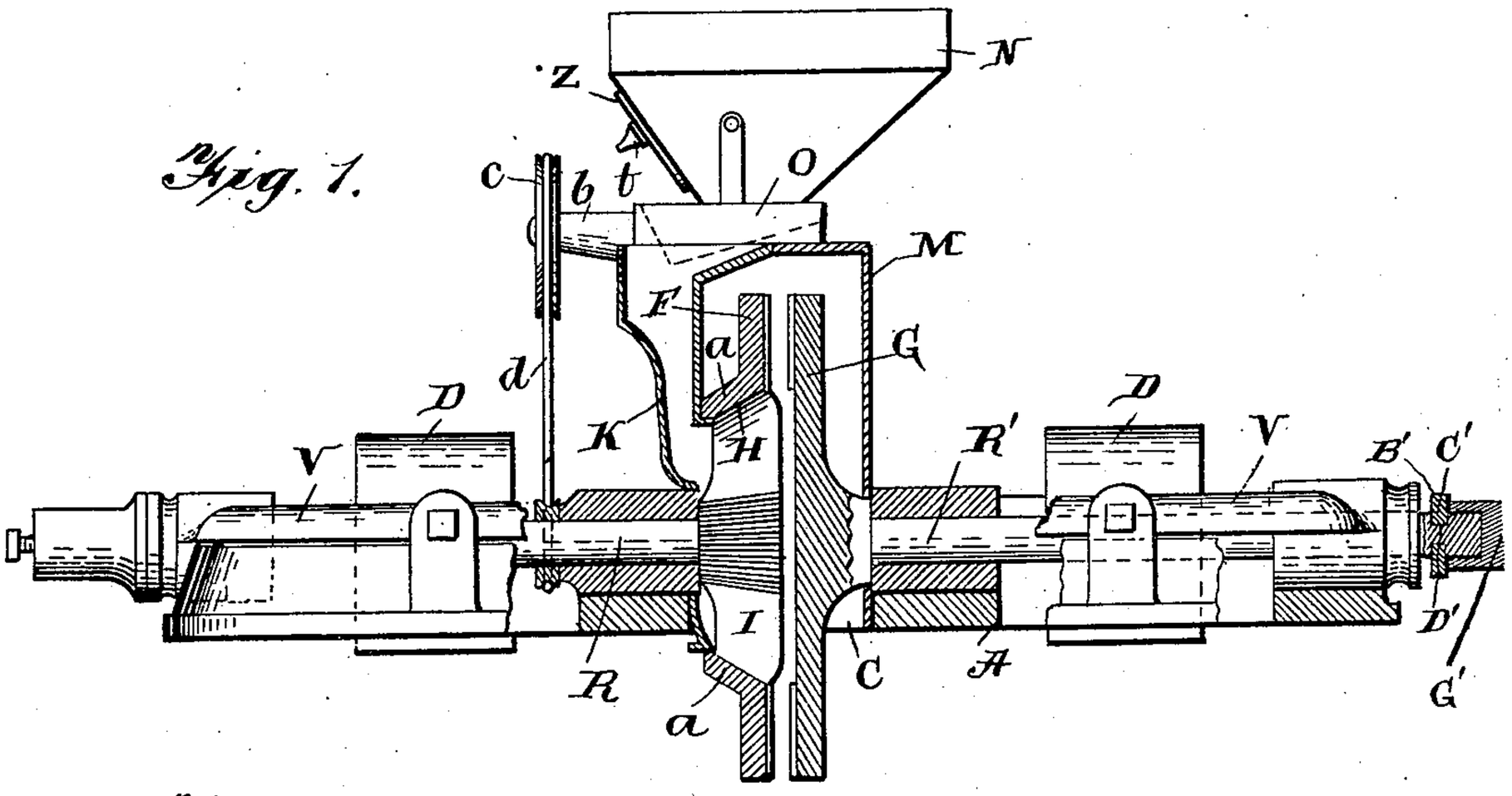



Fig. 2.

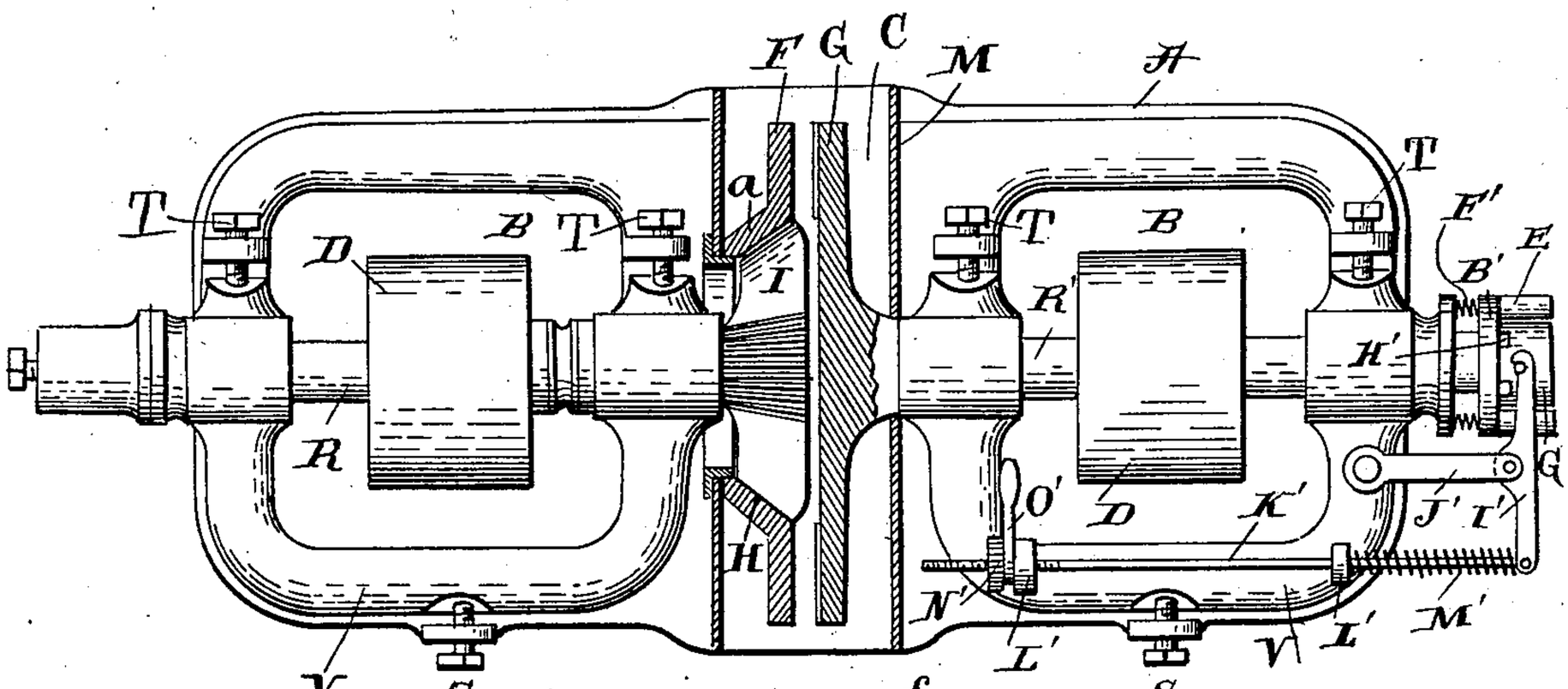
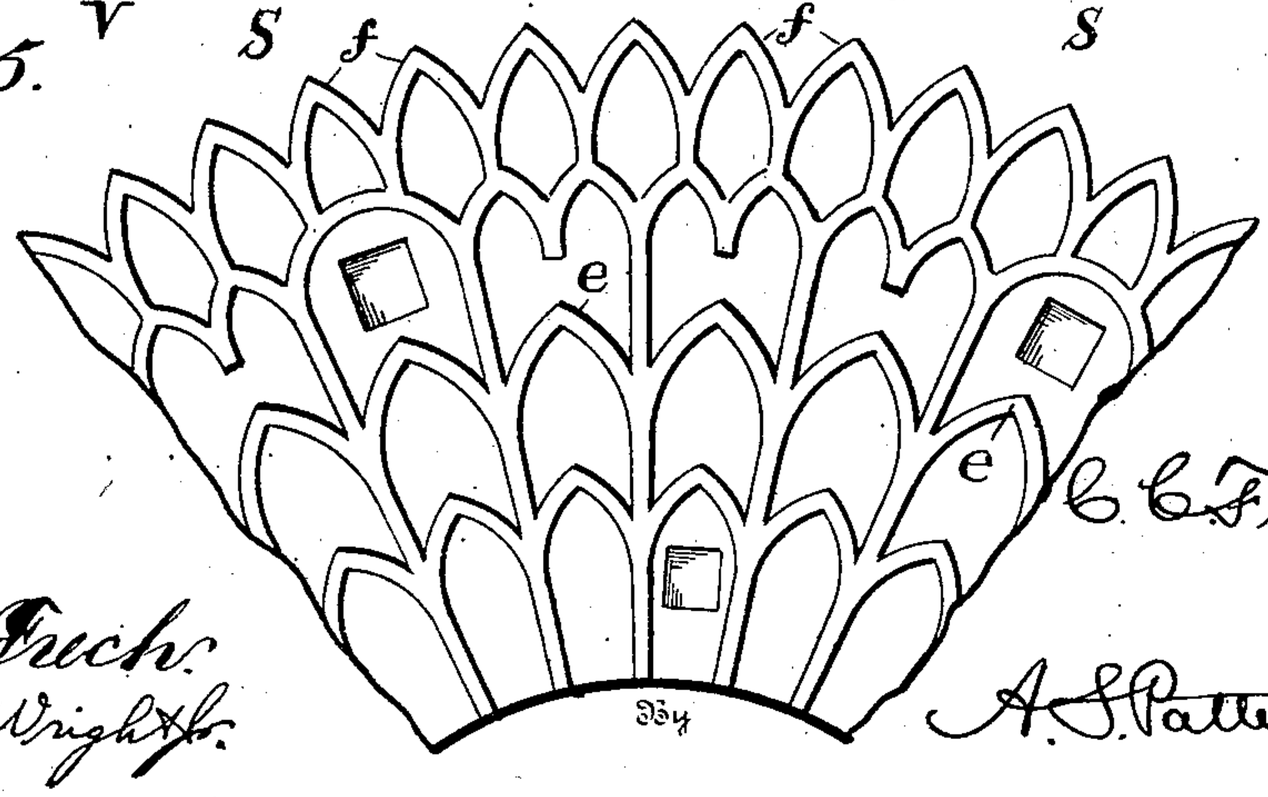



Fig. 5.




Witnesses

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

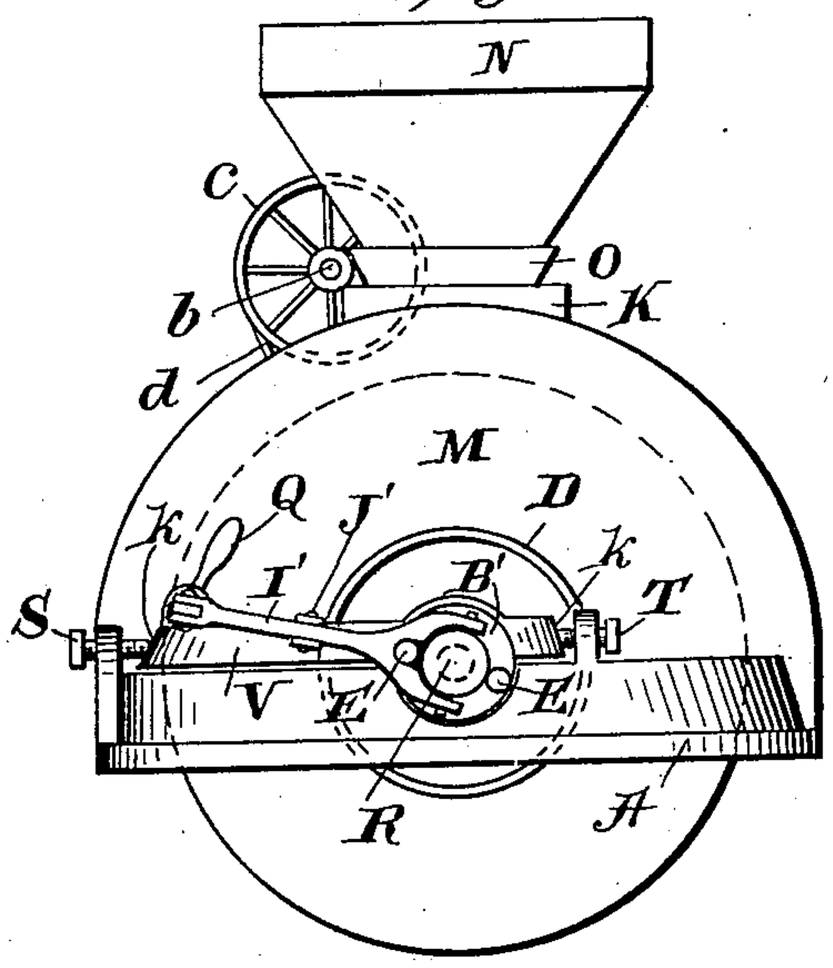



Fig. 4.

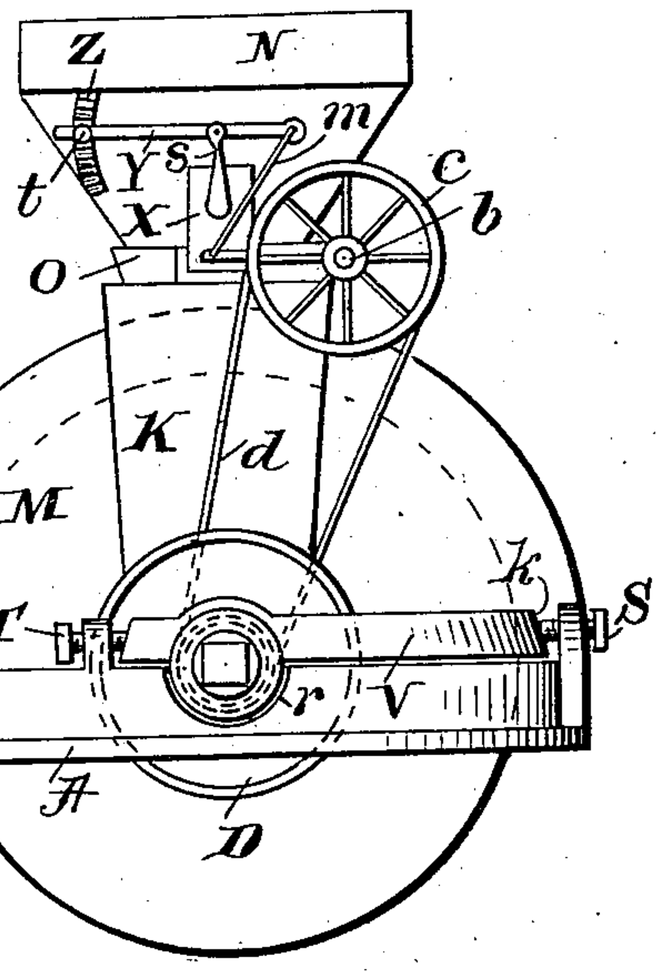



Fig. 6.

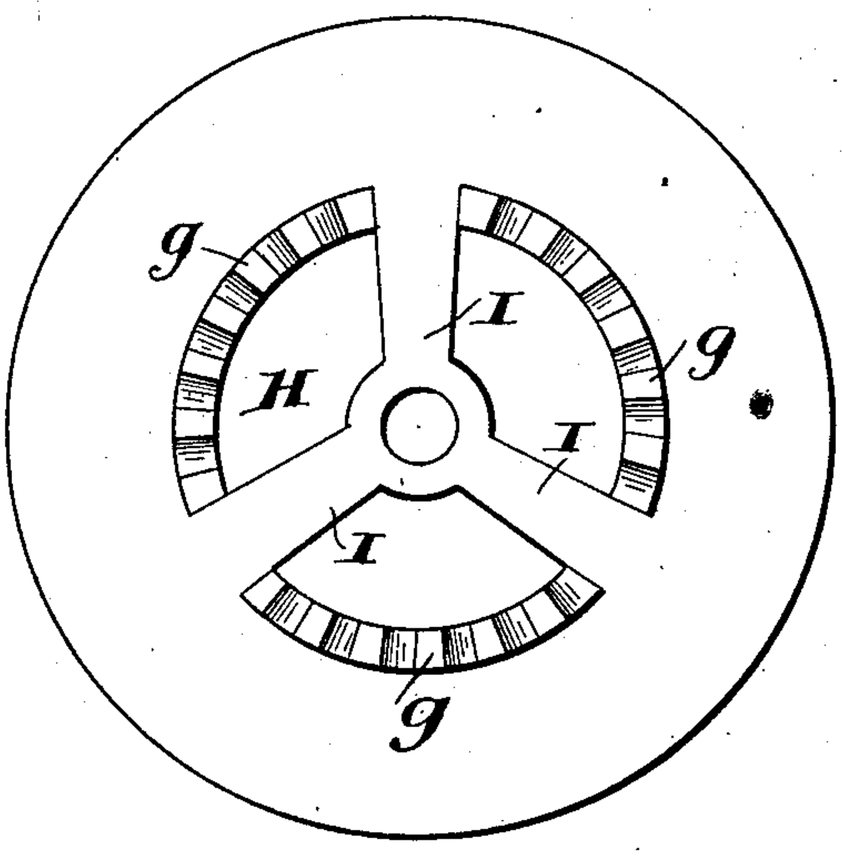
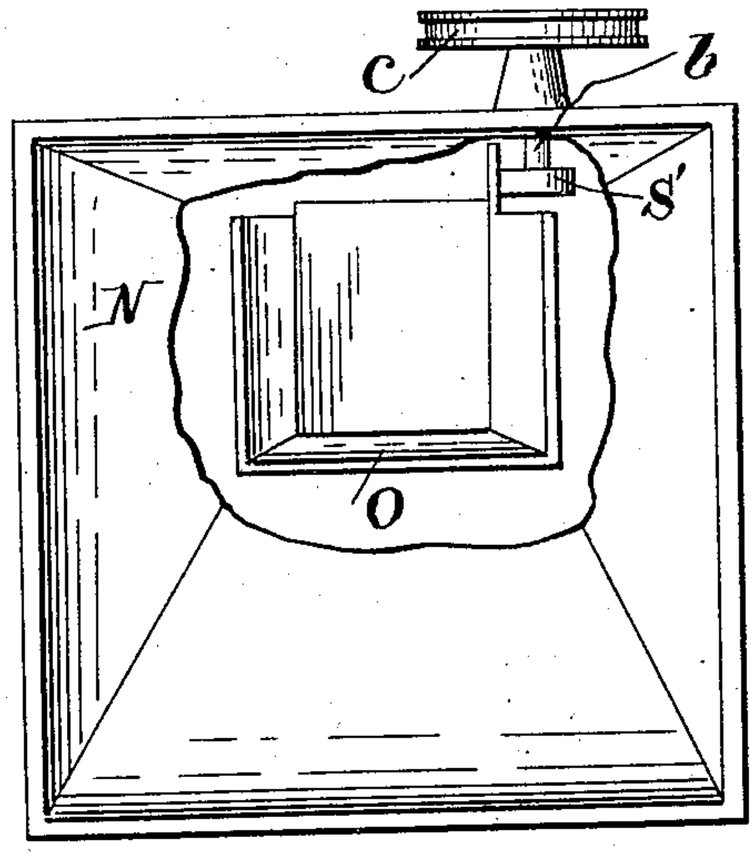



Fig. 7.




Witnesses

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No. 730,631. Patented June 9, 1903.

# UNITED STATES PATENT OFFICE.

CLINTON C. FUSMER, OF McKINLEY, NEW YORK.

## GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 730,631, dated June 9, 1903.

Application filed July 6, 1900. Serial No. 22,721. (No model.)

*To all whom it may concern:*

Be it known that I, CLINTON C. FUSMER, a citizen of the United States, residing at McKinley, in the county of Montgomery and State of New York, have invented new and useful Improvements in Grinding-Mills, of which the following is a specification.

My invention relates to improvements in grinding-mills, and pertains to a mill having oppositely-rotating disks the shafts of which are supported in separate and detachable yokes, all of which will be fully described hereinafter, and particularly referred to in the claims.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a machine embodying my invention. Fig. 2 is a top plan view with the hopper-casing and feeding-spout removed. Fig. 3 is a right-hand end view of Fig. 1. Fig. 4 is a left-hand end view of Fig. 1. Fig. 5 is an enlarged plan view of a portion of the grinding-surface of the disks. Fig. 6 is an enlarged plan view of the grinding-disk F. Fig. 7 is a top plan view of the hopper.

Referring now to the drawings, A is a base-plate which is provided at each end with a pulley-opening B and at the center with a grinding-disk opening C.

At each end of the machine is provided a U-shaped yoke V, having its ends provided with journals for the two shafts R and R'. Each of these shafts is provided with a pulley D, and attached to the inner ends of these shafts are the grinding-disks F and G. The grinding-disk F may be aptly termed the "feeding-disk" and is provided at its center with the openings H, which are formed by the spiders or arms I, and through these spaces the material is fed to the grinding-surfaces of the disks. The disks are held together by spring-pressure, as will be hereinafter described, thus permitting them to separate in the event of a stone or other obstruction being fed to the mill, and thus prevent injury to the grinding-surfaces of the disks. Surrounding the disks is a casing M, upon which is erected a hopper N, and communicating with the lower end of this hopper and with the openings H in the feeding-disk F is a trough or chute K. The feeding-disk F is provided with an outwardly-extending flange *a* around the openings H, which incloses the lower end of the chute K, thus insuring an absolute feeding of the material to the feeding-spaces H and preventing any escape of the material on account of a loose joint, which might otherwise be the case. This trough or chute K is attached to and carried by one of the yokes V adjacent thereto, whereby the yoke and the feeding-disk may be removed from the base-plate A without disturbing the adjustment of the feeding-disk and the chute, as will be readily understood.

For the purpose of adjusting the grinding-disks for grinding fine and coarse and to prevent contact of the grinding-surfaces when the mill is running empty, I provide the projecting end of the shaft R' with a collar B', which has a flange or lugs C', fitting in a groove D'. This collar has spring-containing openings E', in which the small springs F' are placed. One end of these springs fits against the outer walls of the openings E' and their opposite ends engage the yoke V, and they serve to prevent the grinding-faces of the disks from coming in contact. A cap G' embraces and fits loose upon the end of the shaft R' outside of the collar B' and has notches H' to receive a portion of the collar, whereby the collar and the cap are interlocked.

The disks are adjusted by means of a lever I', which is intermediately pivoted to the outer end of a link J', the inner end of said link being pivoted to the yoke V. An adjusting-rod K' passes through lugs L' on the yoke V and has one end connected with the outer end of the lever I'. Surrounding this rod K', between the lever and the adjacent lug L', is a large spring M', and situated upon the opposite end of the rod K' is an adjusting ratchet-nut N', operated by suitable ratchet-lever O' and by means of which the rod and the intermediate mechanism the grinding-disks are adjusted to regulate the fineness of the grinding operation.

The lower end of the hopper N is provided with a shaker O, which is operated by an eccentric S' upon a shaft *b*, whereby the material is agitated in the bottom of the hopper, causing it to be fed to the upper end of the chute K, and this shaft *b* is provided with a pulley *c*, around which a band *d* passes, the said band also passing around one of the shafts R, thus causing the shaft *b* to rotate and the shaker to be reciprocated.

For the purpose of regulating the feed of the material a gate X is provided at the lower end of the hopper, and this gate is connected by a link *s* with one end of an intermediately-pivoted lever Y, the said lever having a set-screw *t*, adapted to be caught in notches upon a segment Z, and the shaker is connected by a cord *m* with the other end of said lever, whereby when the gate is raised or lowered for the purpose of regulating the feed of the material the shaker is correspondingly moved in the opposite direction.

One of the essential features of my present invention is in providing the flange *a*, surrounding the feeding-openings H in the feeding-disk F, with serrations *g*. The object of these serrations is to cause a feeding of the material thereby through the said openings to the grinding-surfaces of the disks and to prevent wear upon the arms I of the said feeding-disk, which materially weakens the disks by cutting away the said arms. When this flange or the edges of the openings are not provided with these feeding notches or serrations, the material is usually not fed to the grinding-surfaces until it comes in contact with the arms I, and it is to prevent this usual wear upon the arms I that the serrations *g* are provided upon the edges of the openings H.

It will be noted that the outer ends of the yokes rest in recesses *r*, formed in the flanges at the ends of the base-plate A, serving to aid in positioning the yokes upon the base-plate and also to support them.

The point of contact of the set-screws T and S with the yokes are beveled, as shown at *k*, so that the set-screws serve to hold the yokes down in contact with the base-plate A, as well as to hold them against sidewise movement and also to lock them against sidewise movement into the desired adjusted position.

In Fig. 5 I show another essential feature of my present invention which pertains to the particular formation of the grinding-surfaces. It will be noted that the edges of these grinding-plates are serrated and that the cutting edges *e* are arched, with the arch extending outward, so as to present no square corners to the grain, and the pitch or curve of this arch may be varied without departing from the spirit or scope of my invention.

The object of serrating the edges of the cutting-disks, as shown at *f*, is to allow an easy discharge of the feed with the least possible amount of friction.

In operation the material is placed in the hopper N and the shaker serves to feed it into the trough K, the amount of feed being regulated by the gate X, and the material then passes directly within the feeding-openings H as the lower end of the trough extends within the flange *a*, and the arms I are situated at a point inside of the flange, whereby the trough does not interfere with the arms as the cutter-disk is being revolved. The material then passes to the grinding-surfaces and the disks and after being ground passes outward between their lower edges, as will be readily understood by those skilled in the art.

A machine of this character is capable of easy adjustment, capable of being readily taken apart and put together and without affecting the adjustment of the machine.

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

1. A grinding-mill comprising a base-plate having at each end pulley-openings, separate and independent horizontally-arranged U-shaped yokes resting upon said base, shafts journaled in said yokes and carrying at their inner ends separate and independent grinding-disks, said yokes having inwardly-beveled upper portions, and said base provided with adjusting-screws adapted to engage said beveled portions, substantially as described.

2. A grinding-mill comprising a base-plate having at each end pulley-openings, separate and independently horizontally arranged U-shaped yokes resting upon said base, shafts journaled in said yokes and carrying at their ends separate and independent grinding-disks, said yokes having inwardly-beveled upper portions, said base provided with adjusting-screws adapted to engage said beveled portions, an outwardly-spring-pressed collar resting within the circular recess in said shaft, a cap carried by the end of said shaft, and interlocking with said collar and means for moving these connected parts, the collar, cap and shaft along the axis of the shaft.

3. A grinding-mill having a grinding-disk having a grinding-surface composed of connected arch-shaped projecting portions, substantially as described.

4. A grinding-mill having a grinding-disk having a grinding-surface composed of outwardly-extending connected arch-shaped projecting portions arranged in circular form around the center of said disk and each row connected to the succeeding outer row, substantially as described.

5. A grinding-mill having a grinding-disk having a grinding-surface composed of outwardly-extending connected arch-shaped projecting portions arranged in circular rows around the center of said disk and each row connected to the succeeding outer row, and the extreme outer row extending beyond the edge of the disk and reduced forming sections on the outer end thereof, substantially as described.

6. A grinding-mill comprising a base, removable yokes carried by said base, grinding-disks rotatably carried by said yokes, a feeding-trough attached to one of said yokes and having communication with the feeding-openings carried by the grinding-disks, substantially as described.

7. A grinding-mill comprising a base, removable and adjustable yokes carried by said

base, shafts rotatably mounted in said yokes, grinding-disks carried by said shafts, and one of said disks having a feeding-opening therein and a feeding-trough carried by the yoke and extending within the opening carried by the disk, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CLINTON C. FUSMER.

Witnesses:
B. F. SPRAKER,
M. M. SHOLL.