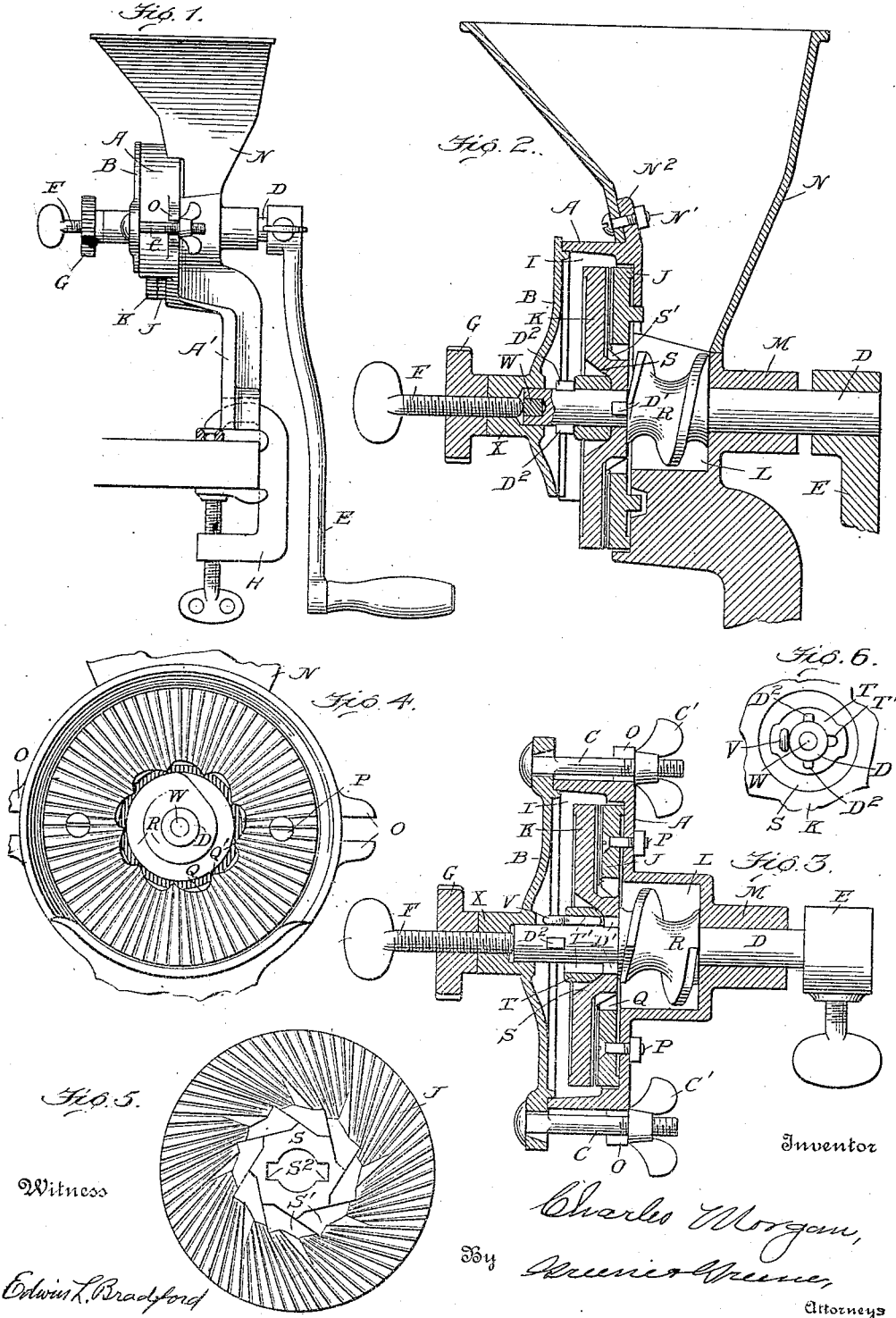


C. MORGAN.
GRINDING MILL.
APPLICATION FILED JUNE 7, 1918.

1,306,610.

Patented June 10, 1919.



Witness

Edwin L. Bradford

Inventor

Charles Morgan,

By

Amos W. Moore,

Attorneys

UNITED STATES PATENT OFFICE.

CHARLES MORGAN, OF FREEPORT, ILLINOIS, ASSIGNOR TO ARCADE MANUFACTURING COMPANY, OF FREEPORT, ILLINOIS, A CORPORATION OF ILLINOIS.

GRINDING-MILL.

1,306,610.

Specification of Letters Patent. Patented June 10, 1919.

Application filed June 7, 1918. Serial No. 238,674.

To all whom it may concern:

Be it known that I, CHARLES MORGAN, a citizen of the United States, and resident of Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates particularly to household grinding mills and its object is to secure a compact mill with few parts, that may be produced at unusually low cost, that is convenient in assembling, adjusting, and separating for cleaning or repair, and that has a high degree of effectiveness and durability.

In the drawings,

Figure 1 shows the mill in side elevation.

Fig. 2 is a vertical section in the plane of the power shaft.

Fig. 3 is a horizontal section in the plane of the same shaft.

Fig. 4 is a front view of the main shell or casing of the mill.

Fig. 5 is a rear view of the rotary disk when on the power shaft.

Fig. 6 shows the rear end of the shaft, its sleeve and retaining cotter pin.

In these figures, A represents the body of the main casing having an integral, forwardly offset support A', B a back plate for the casing, detachably held in place by bolts C and wing nuts C', D a power shaft rotated by a crank E, F a screw for regulating the fineness of the mill's product, G a locking nut for the screw F, and H a clamp by which the support A' may be secured to a table or the like, when desired.

The casing A is a rearwardly open shell having a chamber I to receive grinding disks J, K, and in front of this chamber is a recess L from the front wall of which projects a long boss M to form one bearing for the power shaft D. This recess is fully open to the chamber I and has an upper opening registering with the lower opening of a hopper N which is formed to fit within ribs upon the casing and is secured thereto by a screw N' fixing it to a lug N² of the casing. The casing is further provided with forked lugs O to receive the bolts C. Bolts P fix the grinding disk J to the front wall of the chamber I and this disk has a large central opening Q the lateral walls

of which are provided with hooked offsets Q' which resist movement of material in the direction of the shaft's rotation. The shaft carries in the recess L a preferably integral screw R having an outer diameter nearly equal to that of the aperture Q. Upon the free end of the shaft is non-revolubly mounted a second grinding disk K which has a central frusto-conical projection S extending forwardly and provided with exterior spirally inclined feed ridges or ribs S'. This member is also provided with notches S² to pass over lugs D' on the power shaft D and has in its rear face a central, frusto-conical recess. The shaft also has, at some distance in the rear of the disks other similar lugs D². The second disk is slipped upon the free end portion of the shaft, passed over the first set of lugs and loosely engaged with the lugs of the second set, whereby the disk is compelled to rotate with the shaft. Upon the free end portion of the shaft is then slipped a sleeve T fitting in said recess and provided with internal grooves T' allowing it to pass over the first set of lugs so far that it rests against the bottom of the frustum and barely passes the first set of lugs. Being loose upon the shaft it is then readily rotated to carry the grooves out of registry with the lugs, and into one of the grooves is then slipped a spring cotter pin V, or the like, to prevent the lug from entering the groove. Thus the grinding disk is held between the outer set of lugs and the screw or offset on the shaft. The outer disk is thus effectively and securely held in place although allowed slight adjusting movement with the shaft and is quickly detached without special tools by merely removing the cotter pin. In the end of the shaft is fixed a hardened steel plug W and against this works the rounded end of the adjusting wing screw F, which works in a long boss bearing X upon the back plate B and is locked by a common milled nut G before mentioned.

The back plate as shown consists of materially more than half a circular plate having near the margin of its inner face a rib or flange closely fitting within the walls of the rearwardly open casing A, and also having a central recess in which the closely fitting end portion of the shaft D has a bearing, the shaft thus being held in accurate alinement with the bearing M upon which

less strain is therefore exerted. The plate also has forwardly flared rectangular openings for the square shafts of the bolts C, so that the latter cannot rotate relatively but
 5 can swing into and out of the forked lugs O when the bolts are loosened. The back plate and all its attachments may thus be quickly removed as a whole, exposing the rear disk and the retaining cotter pin, which
 10 obviously cannot possibly move out of place until the back plate is detached.

The support A' has a foot provided with screw holes and further has just above the foot an arch or aperture through which
 15 passes the upper portion of the screw clamp H, that portion being so made as to grip the inner or rear part of the foot, as shown.

In the construction set forth, the shaft has a long bearing in the main casing member
 20 and its rear end portion has a similar bearing in the detachable back plate, where the adjusting screw abuts the hardened axial plug in its end, and when greater fineness is desired, forces the shaft, feed screw, and
 25 grinding disk forward together.

This grinding disk and its integral frustum oppose the rearward movement of material advanced by the feed screw, and the frustum with its ribs aids in directing the
 30 material into the space between the grinding disks. Practically, it is found that with the use of the hooked projections on the walls of the aperture in the fixed disk no ordinary material will clog the mill, but the
 35 screw will force it steadily forward at a rate depending upon the fineness for which the mill has been adjusted.

The shell is of course downwardly open below the disks and the forward offsetting
 40 of the support allows any common receptacle to be placed upon the table in the rear of the support and below said opening. Obviously the mill is made up of few parts most of which are cast iron, the least expensive form of metal, and are such as to
 45 require no cores and very little machine work or hand fitting.

What I claim is:

1. The combination with a casing and a

grinding disk fixed thereto and having a
 50 large central opening, of a shaft extending through said opening and provided with a circumferential shoulder and with two sets
 of rigid radially projecting lugs in different planes transverse to the shaft, a
 55 co-acting grinding disk upon the shaft, having on one face a central projection abutting said shoulder and engaging one set of lugs to prevent rotation with respect to the shaft and having on the opposite face a corre-
 60 sponding recess, and a shaft-incircling sleeve grooved to slide over the outer set of lugs upon the shaft, resting against the bottom of said recess, and adapted to rotate and thus engage behind said lugs.
 65

2. The combination with a shaft having an integral feed screw, a lug at the end of the feed screw, and a second lug at some distance from the feed screw, of a grinding disk having a central shaft-receiving
 70 opening and a notch to enable it to pass over the second lug and engage the first to prevent the disk's rotation on the shaft, a sleeve upon the shaft and grooved internally to allow it to pass over the second lug and
 75 against the disk, and means for preventing accidental outward movement of the sleeve.

3. The combination with a rearwardly open casing having in front a shaft bearing, of a back plate detachably clamped
 80 against the open side of the casing and having a positioning flange fitting therein and a bearing recess alining with said bearing, a shaft mounted in said bearing and recess and having a shoulder and two sets
 85 of surface lugs in different planes, a grinding disk fixed in said casing, a co-acting grinding disk resting against said shoulder and engaging the lugs of one set, a sleeve mounted upon the shaft, fitting between said
 90 co-acting disk and the other set of lugs and internally grooved to pass over the latter, and a pin inserted in one of the grooves and held in place by said back plate.

In testimony whereof I hereunto affix my
 95 signature.

CHARLES MORGAN.