

No. 854,861.

PATENTED MAY 28, 1907.

J. F. WINCHELL, DEC'D.
L. L. WINCHELL, ADMINISTRATRIX.

GRINDING MILL.

APPLICATION FILED SEPT. 29, 1902.

2 SHEETS—SHEET 1.

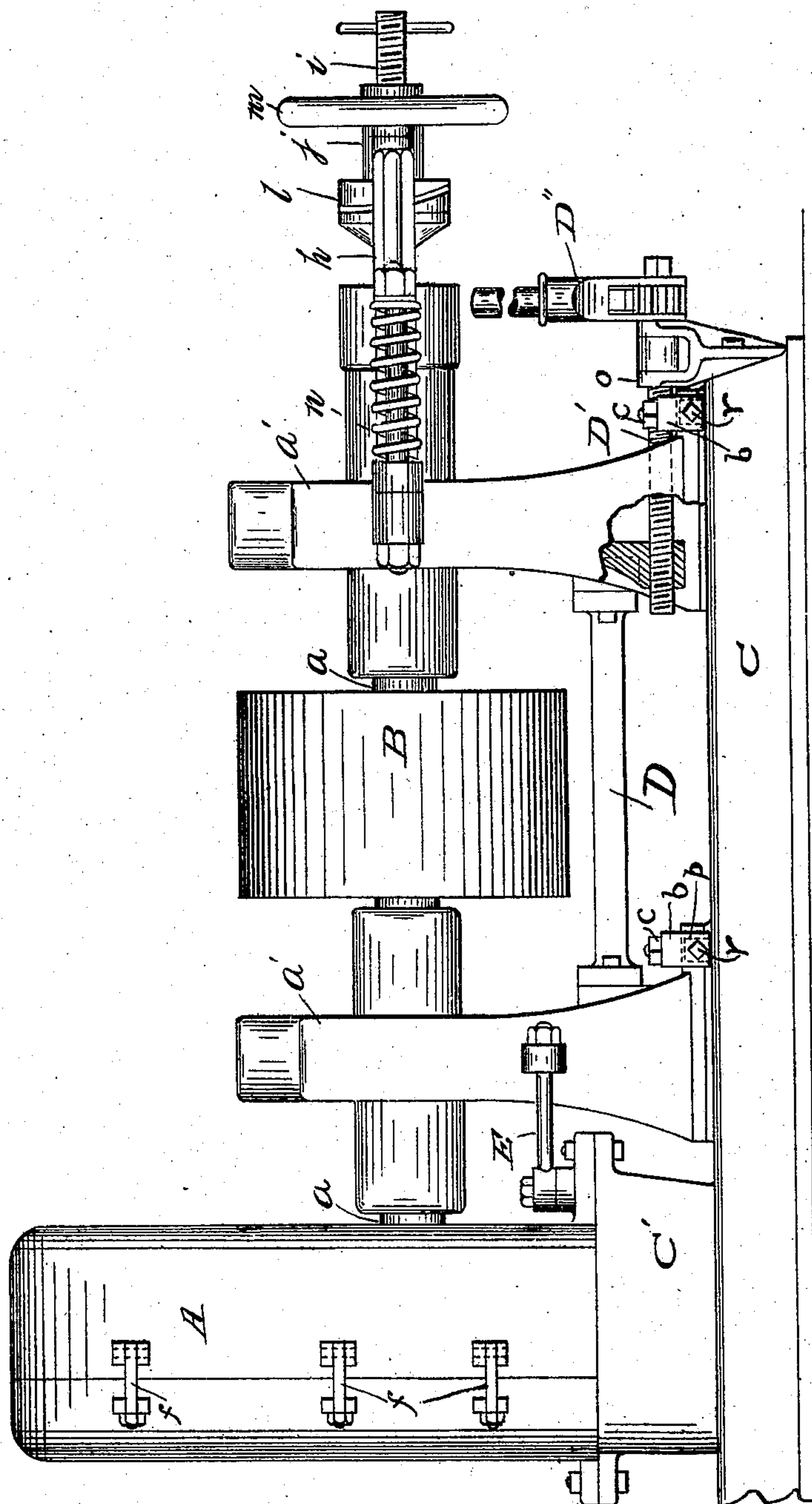


Fig. 1.

Witnesses

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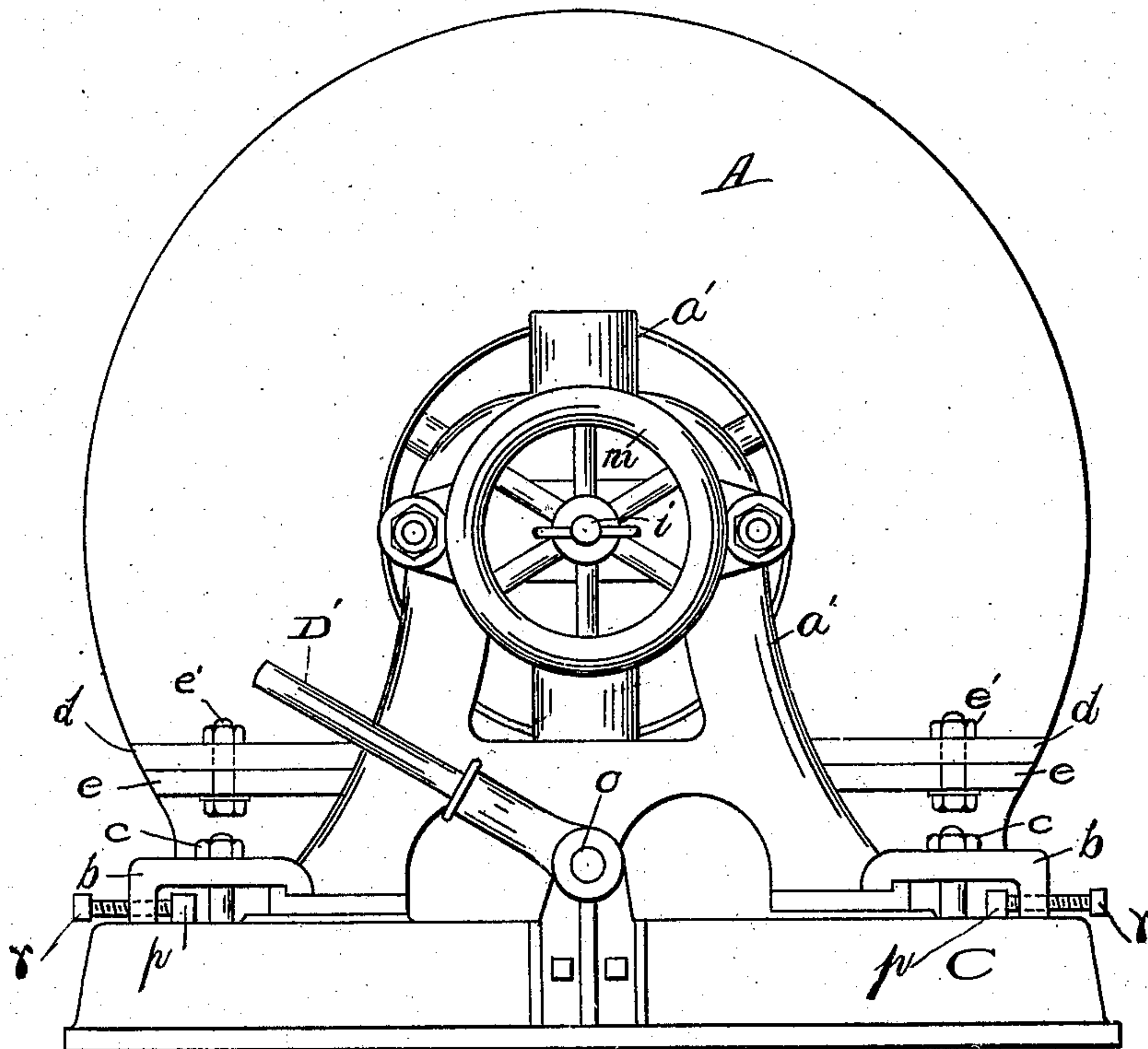


Fig. 2.

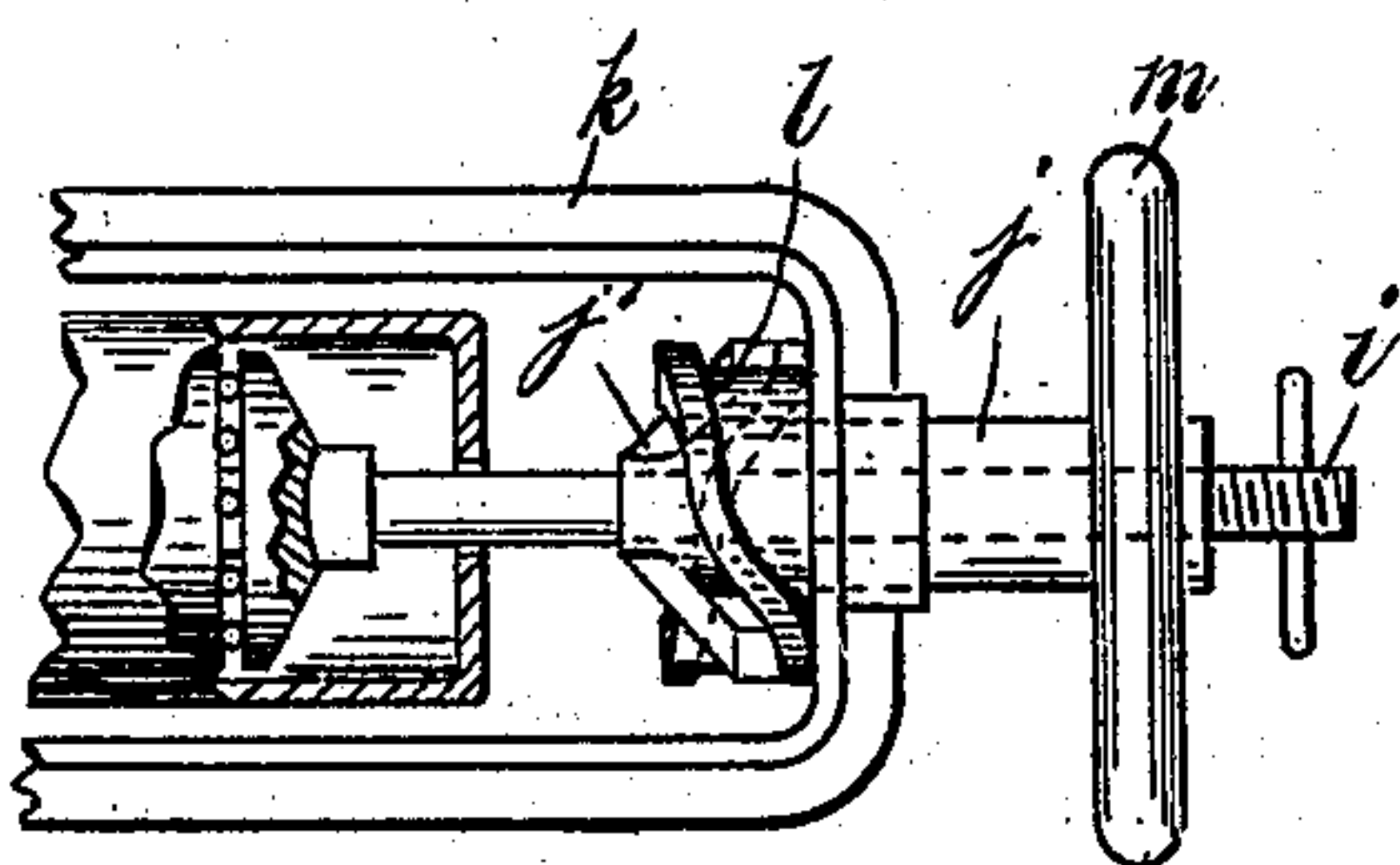


Fig. 3.

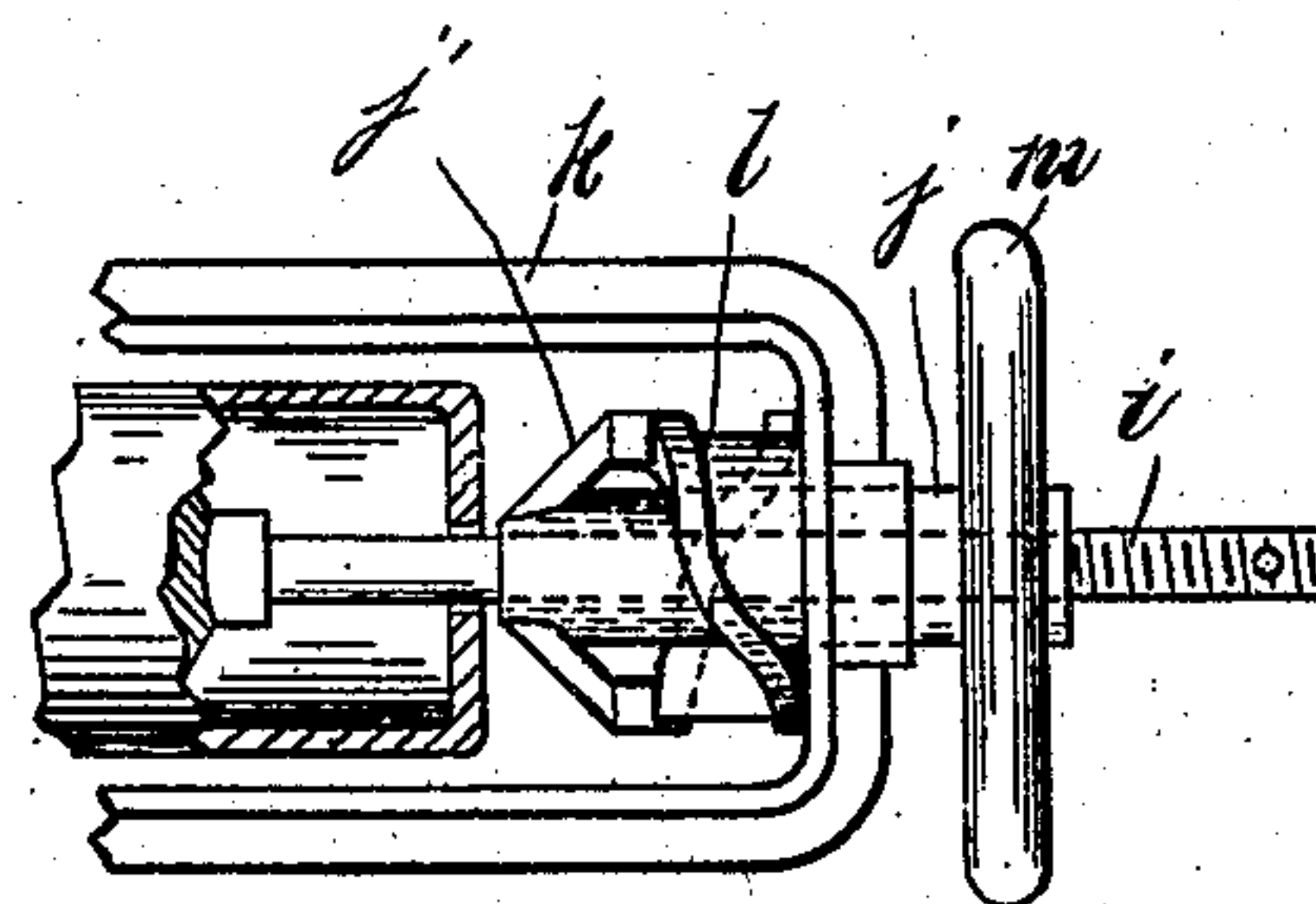


Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

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GRINDING-MILL.

No. 854,861.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed September 29, 1902. Serial No. 125,308.

To all whom it may concern:

Be it known that I, JAMES F. WINCHELL, a citizen of the United States, and a resident of Springfield, in the county of Clarke and State of Ohio, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a full, clear, and exact description.

My invention consists in certain improvements more especially applicable to what are known as attrition mills, wherein the grinding-plates or disks are vertically mounted on horizontal shafts, and pertains to the construction of the standards for the journal-bearings or housings, and the method of clamping or securing the casing in place. The other part of my invention relates to an improvement in the release mechanism, whereby the adjusted revolving plates may be speedily moved or thrown away from or out of their normal position or relation with each other, for any emergencies, without affecting their adjustment for the desired quality of meal, when returned to place.

My invention will be more particularly pointed out and described in the following specification, of which the accompanying drawings form a part; wherein

Figure 1 is a front elevation of mill illustrating my improvements; the journal-bearings or housings and its shaft and pulley to the left of the casing (and which transmits power to one of the grinders or plates in the casing in the opposite direction from the other or right hand side), being omitted, as it is unnecessary in the exemplification of my invention. Fig. 2 is an end elevation of the construction shown in Fig. 1. Fig. 3 is a detail view of my improved release device illustrating it thrown off. Fig. 4 is a similar view showing same on.

Like letters of reference indicate identical parts in the various figures.

My invention relates to improvements in mills in which the material is ground or reduced by attrition.

The shaft *a* (there being a similar shaft extending out from the other side of the casing A) is provided with the usual circular head-plates inside the casing A, to which the grinding plates or faces are secured. The material or grain is fed through a hopper on the mill into the casing A, into the eye of one of the plates or disks, with which it is provided,

and the centrifugal force derived from the rapidly rotating plates or disks, causes the material to fly or move from the eye to the periphery. The grinding plates or faces are preferably provided with longitudinal pockets or sockets, intermediate circumferential rings or ridges.

The two plates or disks are made to revolve rapidly in opposite directions to one another, and the material thrown outward by the rapid rotation of the plates, coming into contact with the rings is temporarily held and brought into violent contact with the other particles or portion of the grain in the casing and intermediate the grinding disks, whereby the grain or material is powdered or reduced.

As before stated, each head-plate or disk is keyed or fastened to an independent shaft *a*, (the one to the right of the casing A, only being shown as sufficient to illustrate the invention) which has its bearings or mountings in the journal bearings or standards *a'*, of the proper construction and provided with the usual babbitted sleeves or boxes and oil chambers. Mounted on and keyed to the shaft *a*, is the pulley B, which receives the power through the medium of a belt, and it in turn revolves the shaft *a*, with its attached head and grinding disks. The journal-bearings or standards *a'*, *a'*, are slidably mounted on the base or bed C.

The various parts heretofore described form no part of my invention.

As access to the casing A must frequently be had by reason of the wear of the grinding plates and for other causes, the casing A is constructed in sections as shown in the drawings, and rests on and is bolted or secured to the sub-base C'.

In mills as heretofore constructed, the journal-bearings or standards supporting the shaft and pulley at the one side of the mill, were mounted on a movable base plate; and when it was desired to replace or have access to the grinding-plates, the various sections or portions of the casing had to be released by unscrewing quite a number of nuts and withdrawing the bolts, and then by the use of block and tackle the inner end of the axle with the head-plate and grinding faces or plates was raised. In these former constructions, where the inner end of the movable bed-plate, with the standards having the oil

chambers in the journal bearings, was raised the desired height, it not only necessitated the provision of proper block and tackle and other apparatus, but also additional labor, and in addition thereto was the loss of time and the loss of oil, the latter being caused by the tilting of the oil chambers, all of which are quite important factors. The oil would thus be drained necessitating refilling or if forgotten, the machinery would become injured. Then again, another inconvenience experienced with the constructions heretofore in use, was the loss of time, attendant upon the care necessary in putting the movable bed-plate with its mountings in proper position; as the proper and safe manipulation of mills of this description required very accurate adjustment of the shafts with their respective head-plates and grinding-faces; as the faces of the grinding-plates are quite frequently brought close together, and as each revolves at a high rate of speed in an opposite direction, any inaccuracy of adjustment causing the plates not to run true, and permitting them to contact with each other, would result in severe injury to the mill and consequent loss and expense. With my improved construction, the loss of time consequent upon the removal of a large number of bolts and nuts; the necessity for block and tackle and its support; the loss of oil and time for re-oiling; the danger of not obtaining the proper re-adjustment; are entirely obviated.

I secure the standards a' , a' , to the bed C, by the clamping-plates b , b , which take over the foot or projection of the standards a' , as clearly shown in Fig. 2, and the plate b , is bolted to and held in place by the bolt c . One of these clamping-plates is provided for each foot of the standards, and they are thus securely held in place.

As shown in Fig. 2, I provide the base or bed C, with lugs p , p , to the side of the base or feet of the standards a' . The clamping plates b , b , are provided with an opening to receive set screws r , r . It will be readily understood from the construction shown in Fig. 2, that when it is desired to adjust the standards a' cross-wise of the base plate or bed C, this can be accomplished by simply loosening the bolts c , and then upon turning the set screws r , in the proper direction, the standard a , will be drawn to either side as the case may be, this being possible by reason of the clamping plates b , b , fitting over the lugs on the feet of the standards. The operation will be readily understood and further description will not be necessary.

Passing from one standard to the other is a connecting rod or link D, whereby the relative position of the standards a' , a' , are maintained, and the action of one made subject to the other. The one standard a' , is provided with screw rod D', (Fig. 1). This

screw rod is provided at its outer or free end with a lever D'', or any suitable mechanism whereby the same may be turned in the desired direction. The rod D', also passes through a yoke or collar o , which is secured to the bed or base C.

It will be seen that upon loosening the bolts c , in the clamping-plates b , b' , the turning of screw rod D', through the medium of the connecting rod D will move the two standards simultaneously horizontally on the bed C.

As illustrated in the drawings, the lower section of the casing is provided with a horizontal flange d , which rests on the flange e , of the sub-base C', to which it is bolted. I prefer to provide the flange e , on the sub-base, with notches into which the bolts e' , take, (as seen in Fig. 2); the reason for which will be hereinafter set forth.

The screw rod D', may be provided with a shoulder intermediate the yoke or collar o , whereby upon turning it, it will retain its position but the threads passing through the threaded hanger or collar of the standard will draw the standard along in the direction of the rod D'. Or the rod D', might be threaded as could also the yoke or collar o , and upon turning the rod D', the same would screw through the collar. Either one of these methods may be employed, and the first construction described is the one illustrated in the drawing. The connecting link or rod D, will of course draw the other standard in the same direction and to the same extent.

The one section of the casing A, I unite or link to the adjoining standard a' , by means of link E.

The casing must be securely fastened together, and this I accomplish by the use of a sufficient number of eye-bolts f , f , which I prefer to construct in the following manner. One section of the casing A, is provided with lugs between which are placed the bolts f , f , which I provide with an eye at this end and these bolts are held in place by a pin passing through the eye of the bolts from one lug to the other as can readily be seen in Fig. 1. On the opposite section of the casing A, and at points in the same horizontal plane with the bolt are studs integral with the casing; these studs provided with a slot or groove into which the ends of the bolts f , f' , may drop. The ends of the eye-bolts are screw threaded and when the bolts are in place, that is, when they have been inserted in the slot or groove of the studs, the bolts being of sufficient length to extend slightly beyond the studs, they are provided with nuts or washers which are screwed into place, and it will thus be seen that by screwing these nuts or washers they will come adjacent the studs and draw the sections of the casing together. By using this method of clamping the sections together, the sections will be snugly

drawn into place and can be very quickly accomplished. Of course, when it is desired to have access to the casing, it will be readily seen that by merely loosening the washers or nuts, the bolts can be swung up out of the way and access had, but the bolts still be retained in proper position to be again fastened into place when it is desired.

In addition to loosening the bolts *f, f*, when access to the interior of the casing is desired, nuts on the bolts *e'*, which pass through the flanges on the lower section of the casing *a*, and sub-base *C'*, must be loosened and also the bolts *c*, in the clamping-plate *b*, and then upon turning the screw-rod *D'*, by means of lever *D''* or any hand-wheel, the standards are simultaneously moved, retaining their relative position with each other, and with them, the side of the casing *A*, by reason of the link *E*.

While I have illustrated and described the bolts *f, f*, as being eye-bolts, it will be readily understood that this construction may be modified and still accomplish the end in view. The bolts *f, f*, can be constructed in many other ways, and I do not wish to be understood as confining myself to the above construction.

The link or eye-bolt *E*, permits of transverse adjustment of the standards and the shafting and pulley when the same is found necessary, and is made possible by simply loosening the bolt taking through the eye of bolt *E*, thus allowing the same to swing slightly on the casing *A*. This transverse adjustment of the standards is accomplished by means of the set-screws and blocks beneath the legs of the standards as illustrated in Fig. 2.

The simplicity of my construction, and the rapidity and ease with which the mill may be handled and access had to the casing, is very apparent, and its advantages are obvious.

I will now describe the "release" mechanism illustrated in the drawings and which forms a part of my invention.

Means, of course, must be provided for the proper lateral adjustment of the head-plates with their grinding faces or plates, to meet the requirement for varying quality of meal. The adjustment is accomplished through the feed or temper-screw *i*, which passes through a threaded sleeve of a rider *j*, and bears against the bearing of shaft *a*. But one of the shafts is intended to move or be adjustable laterally; and the manner of the bearing for the shaft forms no part of my invention. The feed or temper-screw *i*, having been screwed in or out owing to whether fine or coarse meal is desired, it of course, is then desirable to have it remain so until the quality of the meal is intended to be changed.

As occasions frequently arise, either by reason of a piece of metal or other foreign substance getting into the mill from the ele-

vator, or otherwise to throw apart the grinding-plates and thus stop the action of the mill, it is very important to provide means for its accomplishment, and permit of a quick release. This has sometimes been accomplished heretofore by having the temper or feed screw pass through a double threaded sleeve, the sleeve being provided with much coarser threads which take into the upper or central portion of a yoke *k*; the sleeve being provided with a wheel or hand wheel at its outer end. Upon turning the hand-wheel or lever back-ward, the sleeve is screwed out of the yoke, and in turn brings with it the temper or feed-screw, and thus the grinding-plates are released. It will be readily understood, however, that the time consumed in turning the lever and with it the threaded-sleeve far enough to affect the lateral relation of the plates, is often too great and thus frequently fails in its accomplishment. In order to accomplish the result for which it is intended, this quick release or emergency release should be made to act almost instantaneously. To have this effect and overcome the objections of the releases as heretofore constructed, I have devised a release comprising a cam *l*, on the inside central portion or arch of the yoke *k* (a similar cam running in the other direction, being provided on the opposite side of the central portion or arch of the yoke *k*). The sleeve *j*, (which is threaded internally and through which the feed or temper-screw *i* passes) passes through the yoke *k*, and is provided on its inner end with a somewhat arch shaped head *j'*, whose ends ride on the cam.

The edges of the bearing-ends of the head which come in contact with the inclined portions of the cam, are preferably beveled to permit them to slide more readily.

It will be seen, that by turning the hand-wheel *m*, less than half a revolution (see Fig. 4), the rider or head *j'* of the sleeve *j*, will be thrown to the other ends of the cams as seen in Fig. 3, thus almost instantaneously releasing the plates. I prefer to construct the cam *l* with a varying degree of incline, so that when the release is "off," the separation of the plates may not only be sufficient, but when it is desired to throw it "on" again, it can be accomplished without the necessity for too great an effort on the part of the operator.

The release having been thrown off, and the plates separated while the casing *A* was still containing and receiving grain, when it is desired to throw the plates into their proper juxtaposition, considerable difficulty would be encountered if the sudden incline of the cam were maintained throughout, by the sudden impact of the plates with the grain. To obviate this difficulty, I provide the cams with a slower or gradual incline as the rider *j'*, reaches its zenith, or normal po-

sition, thus requiring less power to bring the plates into their proper position finally in the gradual manner.

The yoke *k* is held in place by means of rods *n*, which are secured to the standard. The rods *n*, are provided with coiled springs intermediate the head or nut of the rod and the feet of the yoke *k*, and is of the well known construction. By this means the feed or temper-screw is yieldingly held in contact with the shaft bearing, and permits slight lateral movement of the shaft. This lateral play permitted by the automatic springs, however, is not always sufficient for reasons heretofore stated, and it is to supplement their action, that the quick release is provided.

The advantages of my improved mill are readily apparent, and while, for the purpose of exemplification, I have shown and described mechanism adapted to accomplish the results sought, certain mechanical changes or substitutions may be made without departing from my invention.

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

1. In a grinding mill comprising the bed or base, revoluble shafting, with head-plates secured thereto, a sectional casing inclosing said head-plates, the combination of a pair of standards slidably mounted on said base and to one side of said casing, a link intermediate of said standards and connected therewith, means whereby one of said standards is connected to a section of said casing, and mechanism whereby the pair of standards and the casing-section are moved simultaneously in a direction parallel with the axis of the shaft, substantially as shown and in the manner described.

2. In a mill comprising the base and a sectional casing, a pair of standards, a link intermediate of and connecting said standards, revoluble shafting provided with head-plates, said standards supporting the revoluble shafting provided with the head-plates, means intermediate of the sectional casing, and one of said standards whereby the relative position of the one to the other is controlled, one of said standards provided with a screw-threaded socket, a threaded rod taking into the threaded socket in the standard, so that upon the turning of the rod the pair of standards and sectional casing will be moved simultaneously in the direction of said rod, substantially as shown and for the purpose described.

3. A grinding mill comprising a bed or base, a sectional casing mounted thereon, a pair of standards slidably mounted on the base, means intermediate of said standards whereby they are connected with each other, a link connecting one of said standards with the sectional casing, in combination with means connected with one of said standards

and the bed or base whereby the standards and sectional casing are moved simultaneously but retained in their relative positions, substantially in the manner and for the purpose specified.

4. The releasing mechanism for the grinding-plates of a mill, comprising a yieldingly held yoke secured to one of the standards, a cam in the arch of the yoke, a sleeve passing through the yoke-arch and provided with a head adapted to ride on said cam, said sleeve being threaded internally to receive the temper or feed-screw whose relation with the bearing of the head-plate shafting is altered according to the position of the sleeve-head on the cam, substantially as shown and for the purpose described.

5. In the releasing mechanism for the grinding plates of a mill, a yieldingly-held yoke secured to one of the standards and having a cam in its arch, a sleeve passing through the yoke-arch and provided with a head adapted to ride on said cam, said sleeve being threaded internally to receive the temper or feed-screw, whereby upon the traveling of said head on the cam, the position of the feed-screw in its relation to the head plate shaft bearing is altered, substantially in the manner and for the purpose specified.

6. In the releasing mechanism for grinding-plates of a mill, a yieldingly held yoke secured to one of the standards, a cam having varying degree of incline and located in the arch of the yoke, a sleeve passing through the yoke-arch and provided with a head adapted to ride on said cam, said sleeve adapted to receive the temper or feed-screw and having controllable connection therewith, and mechanism secured to the outer end of said sleeve whereby the same may be operated and the relative position of the feed screw with the shaft bearing varied according to the position of the sleeve-head on the cam, substantially as shown and for the purpose specified.

7. In a mill comprising a bed or base, a pair of standards slidably mounted on said bed or base and supporting the revoluble shafts carrying the head-plates, a sectional casing inclosing the ends of the shafts carrying the head-plates, a link intermediate of and connecting with the standards on one side of the sectional casing, mechanism connecting one of said standards with the sectional casing, and mechanism connected with one of said standards and the bed or base whereby upon its operation the standards and casing-section may be moved simultaneously, substantially as shown and in the manner described.

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