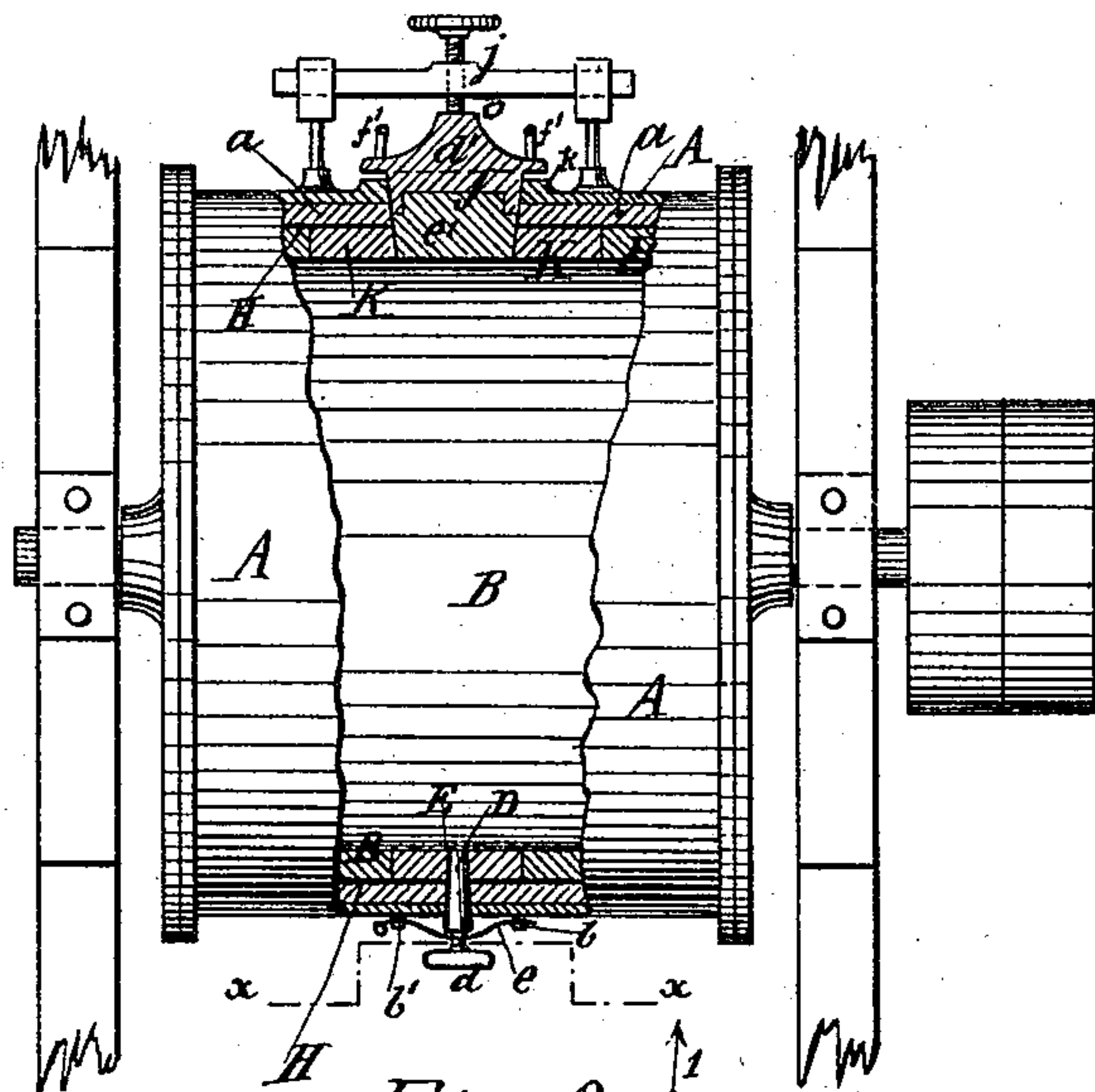


(No Model.)

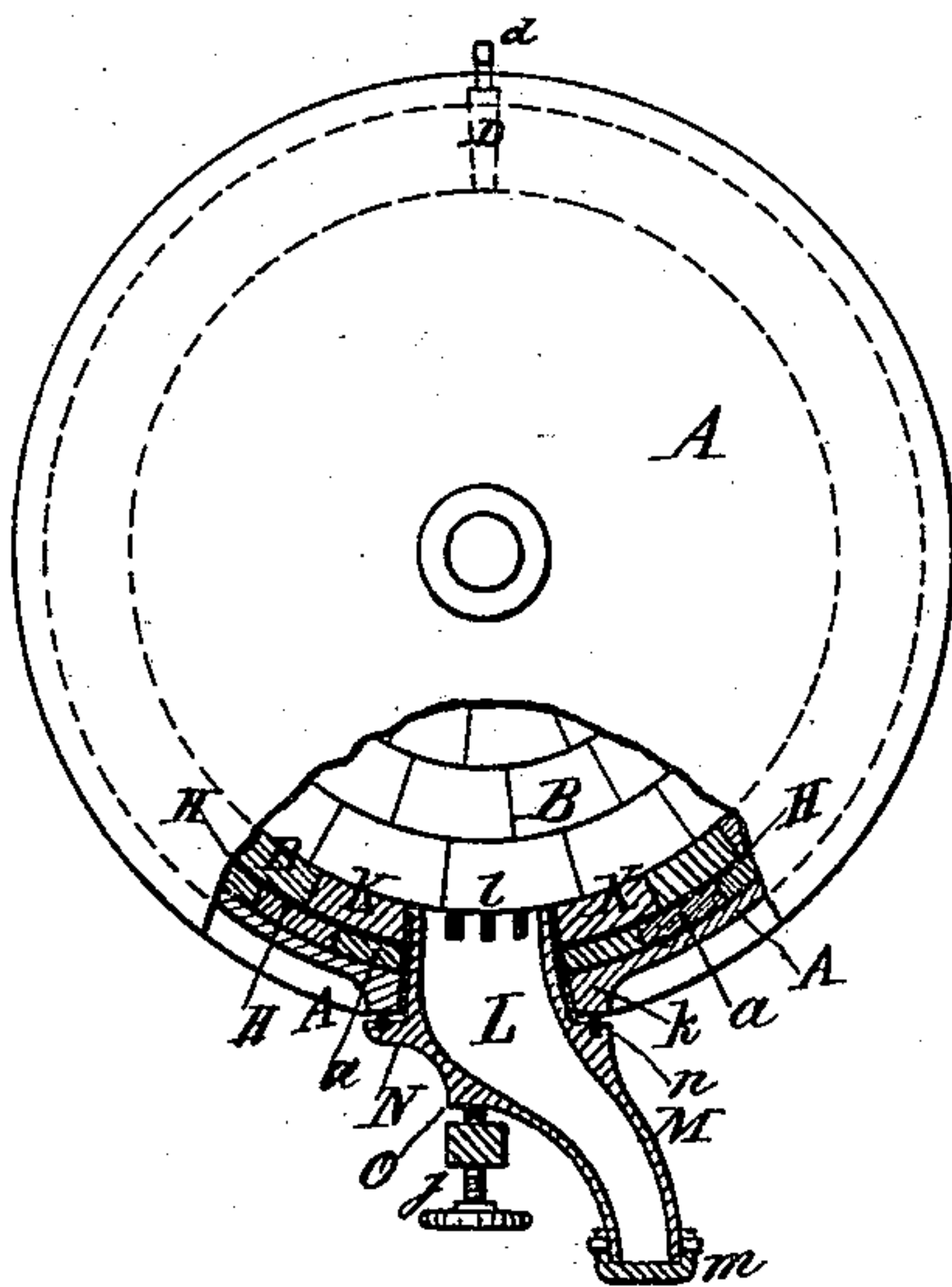
J. R. ALSING.  
TRITURATING MILL.

No. 396,453.

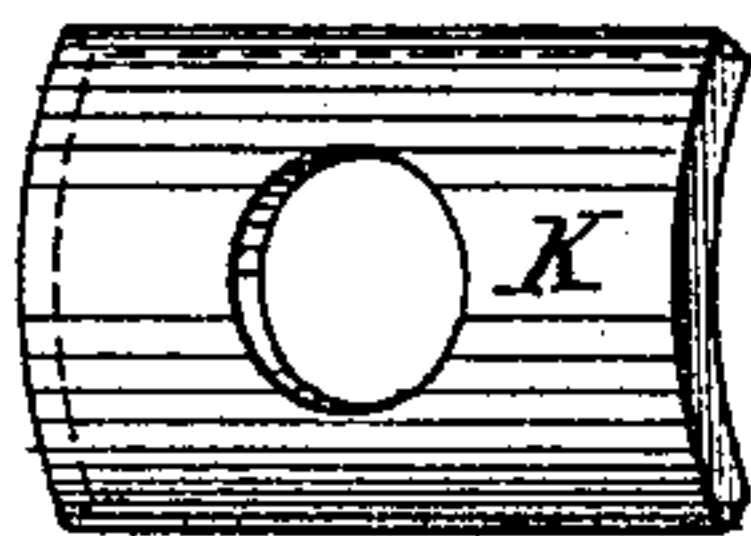
*Fig. 1* Patented Jan. 22, 1889.



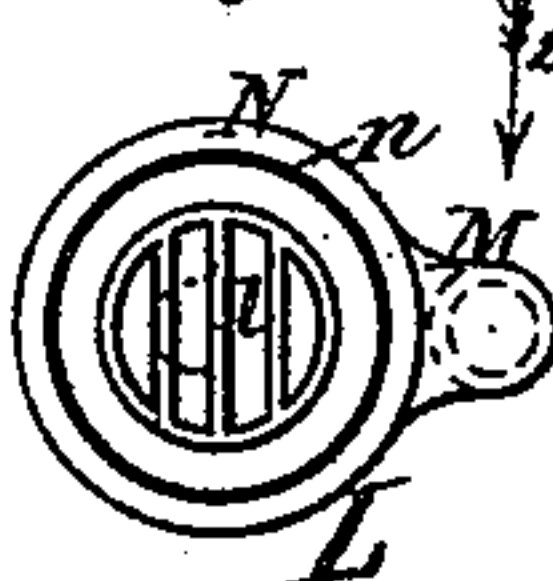
*Fig. 2.*



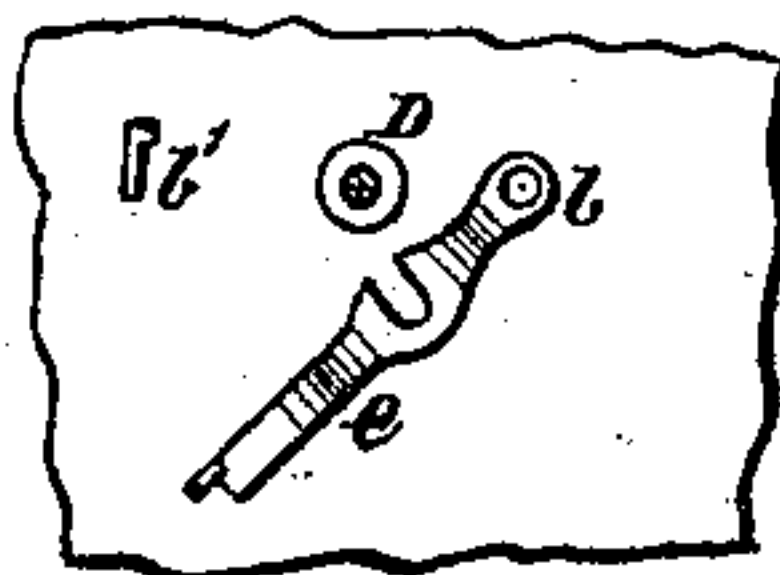
*Fig. 3*



*Fig. 4*



*Fig. 5*



Witnesses:  
*et. Wahlberg.*  
*T. M. Croxson*

Inventor.  
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Attorney

# UNITED STATES PATENT OFFICE.

JOHAN ROBERT ALSING, OF NEW YORK, N. Y.

## TRITURATING-MILL.

SPECIFICATION forming part of Letters Patent No. 396,453, dated January 22, 1889.

Application filed February 11, 1886. Serial No. 191,584. (No model.)

*To all whom it may concern:*

Be it known that I, JOHAN ROBERT ALSING, a citizen of Sweden, and a resident of New York, in the county and State of New York, have invented a new and useful Improvement in Triturating-Mills, of which the following is a specification.

My invention relates to that class of mills invented by me for grinding pottery materials, &c., and generally known in the market as "Alsing's pulverizing-cylinders," in which granulated materials, inclosed together with hard pebbles or balls in a horizontal cylinder, are ground to an impalpable powder by the constant tumbling, rolling, and sliding of the charge, caused by revolving the said cylinder.

The improvement, which will be hereinafter fully described, and specifically pointed out in the claims, has for its object to adapt the aforesaid dry-grinding mill for wet grinding also—that is, grinding the substances together with a liquid—such as water or oil—with which they ultimately have to be mixed before molding, as for porcelain ware, or before application in painting, as for pigments.

In the accompanying drawings, Figure 1 represents, partially in section, a plan view of the cylinder as fitted for wet grinding. Fig. 2 shows, partially in section, an end view of the same as fitted for removing the charge after wet grinding. Fig. 3 is a detail perspective view of the lining-block in which the cover is fitted. Fig. 4 is a detail plan view of the discharge-spout, looking down from its position in Fig. 2. Fig. 5 is a detail view from the section-line  $\alpha\alpha$  in direction of arrow 1, showing the air-plug-fastening device.

A is the exterior iron shell of the cylinder, covered on the inside with a wooden lining,  $\alpha$ , within which is the lining B, of porcelain or other vitreous substance in blocks cemented together and to the wooden lining by plaster-of-paris, as usual.

As porcelain material is spoiled by rust, and in admitting water into the cylinder rust from the outer shell might easily work into the substance, and because the swelling of the wooden lining by the water might cause damage, I provide between the wooden lining  $\alpha$  (or the shell in small cylinders, where a wooden lining is not used) and the lining B a water-

proof layer, H, of hydraulic cement, rubber cement, or any other water-proof substance.

The cover J of the charge-opening is kept tight in the following manner: The iron cap  $d'$  of the cover, which is provided with the ordinary handles,  $f'$ , and a central seat,  $o$ , (against which the screw of the ordinary screw-bar fastening,  $j$ , presses to keep the cover tight,) has a recess in its inner surface, in which a slightly-conical block,  $e'$ , is secured, preferably by heating and shrinking the iron cover on it. The block  $e'$  is turned on its surface, where it enters and fits tightly in the lining B, and a special block, K, constituting a portion of the lining B, is specially made and provided with a round conical opening turned to receive the block  $b'$ , so that the two will fit together in the manner of a stopple ground in the neck of a bottle.

The granulated substances to be operated upon having been introduced into the cylinder through the charge-opening, and the required quantity of triturating balls or pebbles and a liquid—as water, oil, or other suitable substance—introduced with it, the cover J is tightened and the cylinder revolved until the desired fineness is obtained.

To remove the charge, the cylinder is placed in position with the cover up. The cover is then removed and in its place is inserted the discharge-funnel L. This is provided with a hollow slightly-conical part, suitable to replace the block  $e'$  in the opening, and its inner end is provided with grate-bars  $l$ , by which the triturating-balls are retained in the cylinder, while the finished charge is enabled to flow out. In one piece with the funnel L is the discharge pipe or spout M, preferably curved, as shown in Fig. 2, to insure an easy flow of the substance, and covered on the end with a cap,  $m$ , securable by threads or simply a bayonet-joint or other mode of fastening sufficient to prevent spilling while turning the cylinder to bring the discharge-spout from the position where it was inserted, as in Fig. 1, to the lower position, as in Fig. 3.

The charge-opening is surrounded outside the cylinder with a ring,  $k$ , of flat surface, and the discharge-spout is provided with a flange, N, in which is an annular groove, and in the said groove a rubber ring,  $n$ , placed on its



edge, which, when the discharge-spout is in position, tightens against the aforesaid rim or ring *k*. Upon the surface of the discharge-spout, in line with the cylinder's radius drawn through the center of the charge-opening, is a seat, *O*, exactly corresponding to the similar seat *o* upon the cover *J*, so that when the cover is removed and the discharge-spout inserted in its place the same ordinary bar and screw, *j*, may be used to secure it in place and tighten the packing-ring *n* against the surface of the ring *k*.

It is evident that when the cylinder is used for dry grinding only the discharge-opening may be closed by the old-fashioned grate without the spout, the spout being necessary for taking out the charge after wet grinding only, although it may be used even after dry grinding. To prevent stopping of the discharge by a vacuum caused in the cylinder, air should be admitted above the surface of the liquid. This is done by making a conical air-hole, *E*, through the side of the cylinder opposite to the discharge-opening, and fitting tightly into the said aperture a conical plug, *D*, of porcelain or other vitreous or other material, and adapted to wear uniformly with the lining *B*, the inner end of the plug when fitted tightly being flush with the inner surface of the lining-block in which it fits. The plug *D* has a handle *d*, like that of an ordinary barrel-tap, the neck being narrowed and the body of the plug joining the latter to the handle. A spring-latch, *e*, pivoted, with one end at *b*, to the shell of the cylinder and in position to be swung toward or away from the plug *D*, is cut out, as shown in Fig. 5, so as to embrace the neck and press on the plug *D* inward when swung from the position shown in Fig. 5 into the position of Fig. 1, in which the free end of the spring-latch *e* is entered underneath a retaining hook or catch, *b'*.

The tendency of the spring being to expand with its free end away from the cylinder-shell, it is evident that when bent against the tendency of its tension and caught on the hook *b'* it will exert a constant pressure upon the plug *D* to retain it in the aperture *E* after first tightening it there by hand by means of the handle *d*. When the charge is to be taken out of the cylinder, the aforesaid spring-latch *e* is turned aside, as in Fig. 5, and the plug *D* taken out by means of the handle *d*.

The discharge may be collected in any suitable receptacle below the discharge-spout, or

may be conveyed to a tank a distance away from the cylinder by connecting a conveying-pipe to the end of the spout.

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

1. In a triturating-mill, the combination of a cover, *J*, composed of the cap *d'*, and the inner block, *e'*, secured to the said cap, with the cylinder provided with lining having an integral block, *K*, formed with a hole or opening suitable to tightly fit the said block *e'*, substantially as specified.

2. The combination, with a triturating-cylinder having a charge-opening, of the spout or funnel *L*, provided with an inner grate, *l*, and a discharge-pipe, *M*, and adapted to replace the cover in the charge-opening, substantially as specified.

3. The combination, with a triturating-cylinder having a charge-opening and ring *k*, of the spout or funnel *L*, provided with an inner grate, *l*, and an outer discharge-pipe, *M*, and adapted to replace the cover in the charge-opening, the same being provided with a flange, *N*, and a packing-ring, *n*, in the said flange, and with the screw-seat *O* and a set-screw engaging the said seat and threaded through an arm or bar attached to the said cylinder to form a tight packing with the ring *k*, surrounding the discharge-opening, substantially as hereinbefore set forth.

4. In a triturating-mill, the combination, with the cylinder having lining *B*, discharge-opening, and an air-hole, *E*, to facilitate the discharge through said opening, of the plug *D*, fitting tightly the said air-hole, said plug being made of material adapted to wear off by the grinding action evenly with the inner lining, *B*.

5. In a triturating-mill, the combination, with the cylinder having lining *B*, discharge-opening, and an air-hole, *E*, to facilitate the discharge through said opening, of the plug *D*, fitting tightly the said air-hole, and the spring-latch *e* and catch *b'*, to tighten the said plug, substantially as specified.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 22d day of January, 1886.

JOHAN ROBERT ALSING.

Witnesses:

A. W. ALMQVIST,

T. M. CROSSMAN.