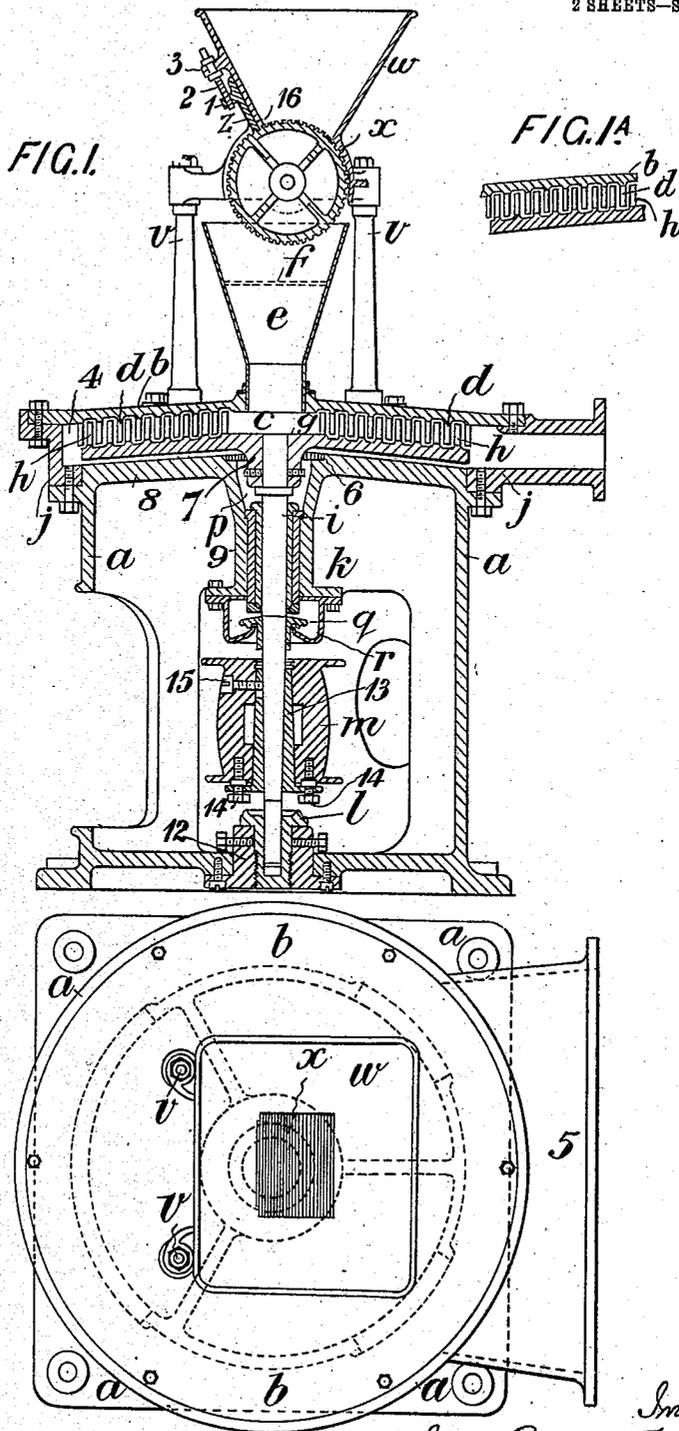


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 CENTRIFUGAL DISINTEGRATOR.  
 APPLICATION FILED SEPT. 6, 1906.

901,217.

Patented Oct. 13, 1908.

2 SHEETS—SHEET 1.



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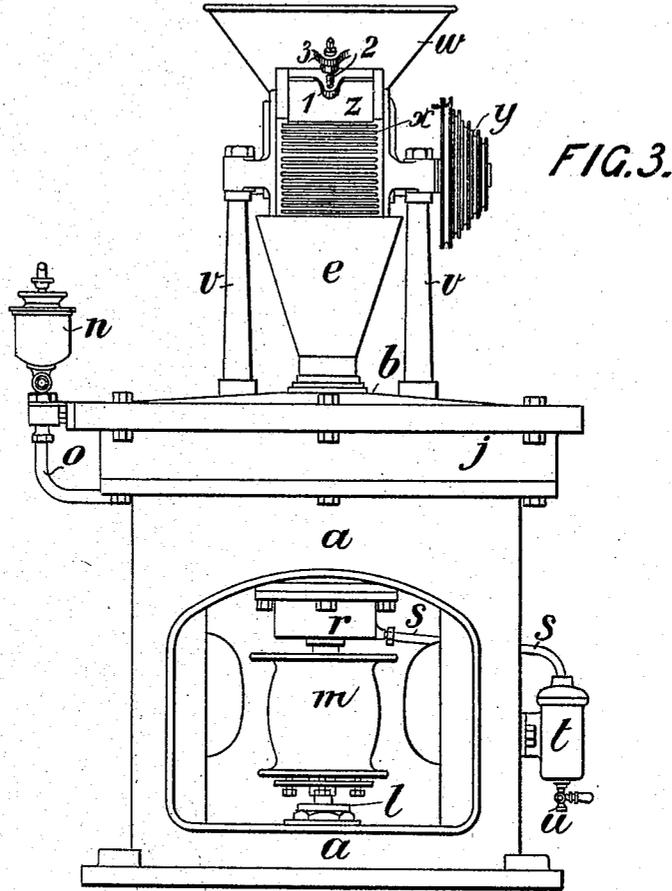


FIG. 4.

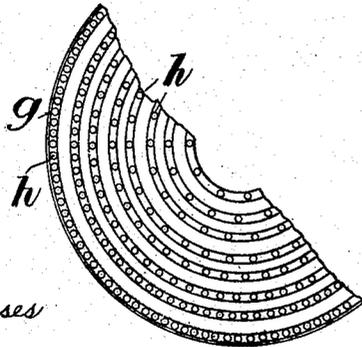
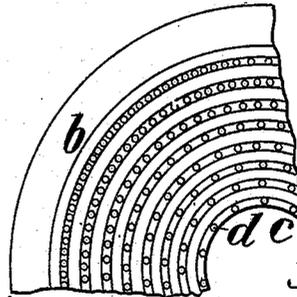


FIG. 5.



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# UNITED STATES PATENT OFFICE.

JEAN BAPTISTE TOUYA, JR., OF TARBES, FRANCE.

## CENTRIFUGAL DISINTEGRATOR.

No. 901,217.

Specification of Letters Patent.

Patented Oct. 13, 1908.

Application filed September 6, 1906. Serial No. 333,468.

To all whom it may concern:

Be it known that I, JEAN BAPTISTE TOUYA, the younger, a citizen of the French Republic, residing at Tarbes, in the French Republic, have invented new and useful Improvements in Centrifugal Disintegrators, of which the following is a specification.

This invention consists in improvements in centrifugal disintegrators suitable for pulverizing grain, ore or other material.

My disintegrator is of that type in which a cylindrical disintegrator chamber is used consisting of a circumferential ring provided with outlet for the disintegrated material. I provide an upper disk or cover with central hole for receiving the material to be disintegrated and said cover is concave on the inner or under side and provided with concentric rows of depending pins or studs, and a bottom disk which is rotated in the chamber, said bottom disk being provided with concentric rows of upstanding pins or studs intermediate of and clearing the rows of the aforesaid depending pins.

The object of my invention is to improve the disintegrating action. For this purpose I make the top or cover of the aforesaid chamber concave on its lower or inner side the inclination being considerably less than thirty degrees and the rotatory disk correspondingly convex so that the opposed faces of said disks are parallel.

Another part of my invention consists in setting the studs or pins closer together the further they are situated from the center.

In order that the invention may be more easily understood reference will be made to the accompanying drawings which illustrate an example of disintegrator having my improvements applied thereto.

Figure 1, is a sectional elevation of the disintegrator. Fig. 1<sup>a</sup>, a sectional detail view. Fig. 2, a plan. Fig. 3, a side elevation. Fig. 4, a plan view of the rotating convex disk. Fig. 5, an inverted plan of the cover of the disintegrator chamber.

The disintegrator chamber consists of a circumferential ring *j* provided with a lateral outlet *5* for the disintegrated material, an upper disk or cover *b* with central hole *c* for inlet of the material to be disintegrated. The cover is concave on the inner or under side, in which latter are suitably fixed a number of concentric rows of downwardly pointing round studs or pins *d*. In the chamber is arranged a rotatable disk *g*

which is of a convexity corresponding to the concavity of the underside of the aforesaid chamber top or cover *b*. This disk is provided with concentric studs *h* intermediate of and clearing the rows of the studs or pins depending from the underside of the chamber cover *b*, as clearly shown in Fig. 1<sup>a</sup>. In order to increase the efficiency of the apparatus the studs are by preference as shown in Figs. 4 and 5, set closer together the further they are situated from the center.

The degree of concavity is important as it is found that if such degree is executed very greatly beyond that shown on the drawings the material under treatment appears to move outwardly in too close contact with the chamber cover *b* and clogging and heating result. On the other hand if the angle be less than that shown the conditions are nearly approximate those obtaining with the horizontal plane or flat disk type of machine heretofore in use in which machine it is found that the material passes out to the periphery too easily and quickly for complete disintegration to take place. The concave-convex form shown causes the grain first to strike against the underside of the cover *b* and to be then thrown off on to the rotator disk *g* and to follow a sinuous and not a straight course; it is thus more completely and uniformly brought into contact with the disintegrating studs *d*.

Mounted in the hole *c*, is the lower end of a chute or funnel *e* which is provided with a sieve or grating *f*. The convex disk *g* which is provided with the concentric rows of upstanding studs *h* is fixed on the upper end of a vertical shaft *i*. The latter revolves in a bearing *k* of anti-friction metal supported in a sleeve *9* and in a footstep bearing *l* of phosphor bronze fixedly arranged in a bush *12* bolted to the base of the casing *a*. The rows of studs *d* and *h* are of such a diameter and are set so far apart in a radial direction that they clear each other by about 4 millimeters more or less according to the fineness of pulverization desired and the diameter of the fixed concave plate and the convex disk is proportional to the output of the apparatus. The shaft *i* is driven in the usual manner by a pulley *m* which is fixed to the shaft *i* by a cone sleeve *13* in two parts, which sleeve is placed around the shaft *i* and is connected to the pulley *m* by bolts *14*, screwing into the pulley. By turning the bolts *14*, the pulley being held to the shaft

by the set screw 15, the coned sleeve is forced into the pulley and tightly wedges the latter to the shaft *z*. In order to effectually lubricate the shaft *z*, which suitably receives 2500 revolutions a minute, more or less, a lubricator *n* Fig. 3, is provided which by a pipe *o* conveys the oil to the chamber *p* above the bearing *k* and surrounding the upper end of the shaft. The chamber *p* is formed by expanding the upper part of the sleeve 9 as shown. As the oil passes down between the bearing and the shaft *z*, it comes on to a convex oil shield or disk *q* fixed to the said shaft and is thrown off by centrifugal action into the annular oil chamber *r* whence it passes away by a pipe *s* Fig. 3, to a waste oil receptacle *t* whence it may be drawn off by a cock *u*. The chamber *r* preferably consists of a metal cup having a central hole, the bottom of the cup sloping from the central hole downwards to the walls of the cup. The upper edge of the cup is flanged enabling it to be bolted to the lower flange 10 of the sleeve 9.

Above the chute *e* is mounted on columns *v* a hopper *w* provided at its lower end with a serrated or longitudinally fluted drum *x* on the shaft of which is mounted a five speed coned pulley *y* which is suitably driven at the desired speed. The hopper *w* is curved at its lower end to approximately fit the exterior of the fluted drum which more or less closes the hopper and it is also provided with a regulating slide or gate *z* having a nut 1 through which passes a screw 2 mounted so as to be immovable longitudinally in a bearing 3 on the outside of the hopper. By turning the screw 2 the gate *z* is lifted or lowered to uncover or to cover respectively the opening or port 16 in the wall of the hopper *w*, thus the amount of grain, ore, or other material passing into the chute to be pulverized may be accurately regulated. The said material falls down the chute *e* on to the middle of the convex disk *g* and is then thrown outwards by the centrifugal action on to the different rows of studs, one

after the other and is finely and uniformly pulverized. This latter action is greatly increased and rendered more perfect owing to the sloped or curved shape of the concave fixed cover *b* and the convex revolving disk *g*. Finally the pulverized material reaches the annular passage 4 partly inclosed by the portions towards the peripheries of the plate *b* and the disk *g* and partly by the ring *j*. From the passage 4 the material passes out by the lateral discharge chute 5 which may be bolted on to the ring *j* as shown, or formed integrally therewith and in order that none of the material shall penetrate to the bearings *k*, there is a packing ring or washer 6 just below and surrounding the boss 7 of the convex disk *g*.

I claim:

A centrifugal disintegrator comprising a convex disk, the inclination of which is considerably less than thirty degrees, means for rotating said disk, an upper stationary disk having a concavity conforming to the convexity of the first mentioned disk so that the faces of said disks are parallel, means for supporting the stationary disk a suitable distance from the convex disk, means for feeding material into the inclined space between the disks, concentrated rows of upstanding pins on the convex disk, and concentric rows of depending pins on the concave disk alternating with those on the convex disk, all the pins of the same length and the pins of the rows being closer together near the periphery of the disks than the pins of the rows near the center, whereby the fineness of pulverization of the material is increased from the center towards the periphery.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JEAN BAPTISTE TOUYA, JR.

Witnesses:

LEWIS BAUHITT,  
ALBERT PHILLIPS.