No. 863,589. PATENTED AUG. 20, 1907.

I. A. CHAVANNE & B. OLLAGNIER.

MILL.

APPLICATION FILED JAN. 29, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

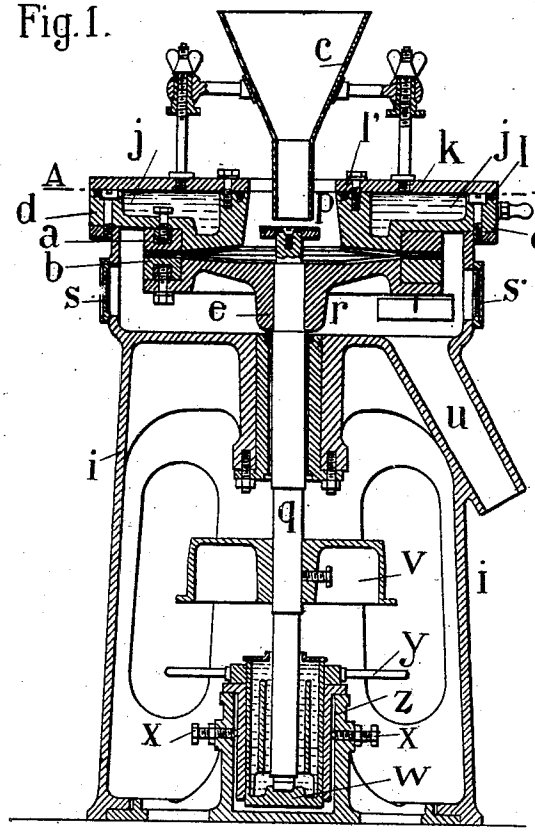
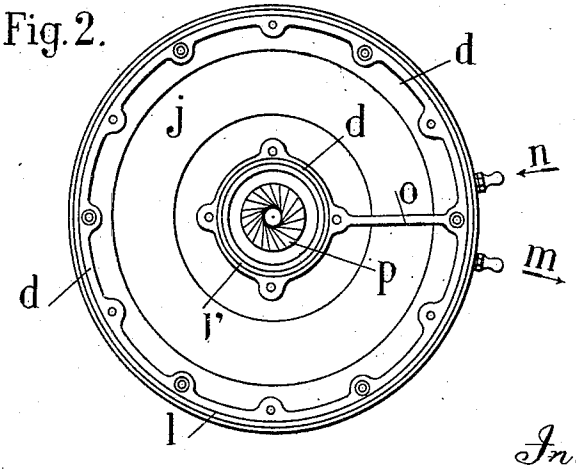



Fig. 2.




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2 SHEETS—SHEET 2.

Fig.5.

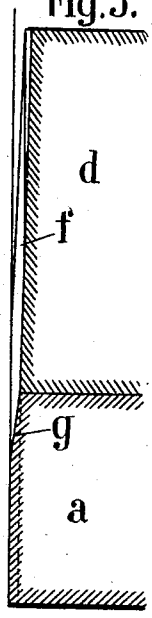



Fig.3.

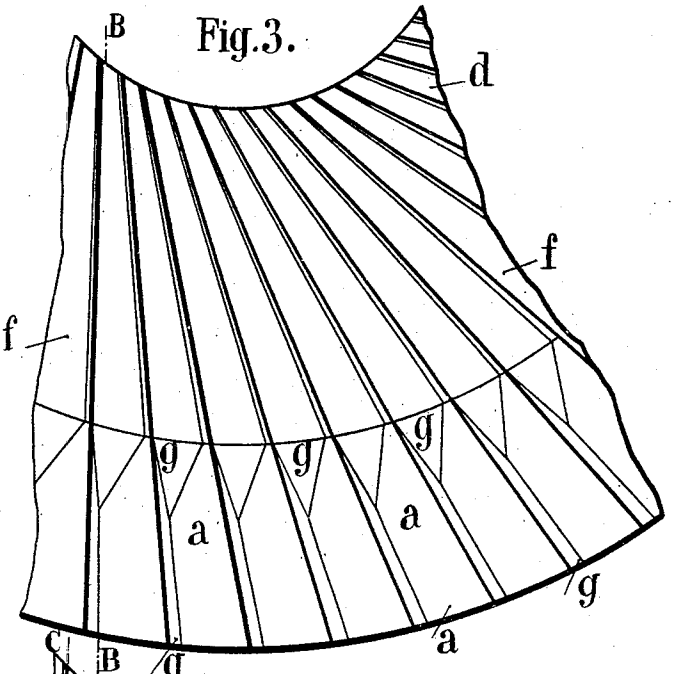



Fig.6.

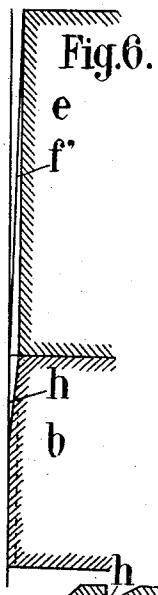



Fig.4.

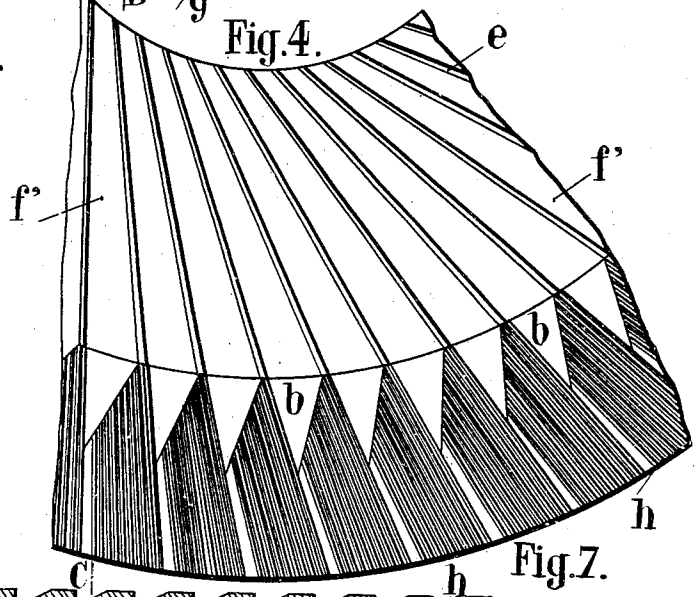



Fig.7.

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# UNITED STATES PATENT OFFICE.

IRÉNÉE ALEXIS CHAVANNE AND BARTHÉLEMY OLLAGNIER, OF ST. CHAMOND, FRANCE.

## MILL.

No. 863,589. Specification of Letters Patent. Patented Aug. 20, 1907.

Application filed January 29, 1906. Serial No. 298,569.

*To all whom it may concern:*

Be it known that we, IRÉNÉE ALEXIS CHAVANNE and BARTHÉLEMY OLLAGNIER, both of St. Chamond, Loire, France, have invented a new and useful Improvement in Mills, which improvement is fully set forth in the following specification.

This invention has for its object a mill having stones formed of hard metal such as hardened cast iron or steel in which the fixed or stationary stone is cooled by a water circulation, the said mill is more particularly intended for the completion of the operation of rolling out the grain and finishing the brans; for converting the dressed semolina into dunts and flour; for converting the dunst into flour; and for treating the tailings. These operations take place during the passage of the material to be treated between two millstones or crowns of hard metal, the stones being mounted on furrowed carriers.

The stationary stone is not provided with grooves but with holes for the admission of the material to be ground and the circulation of air while the movable stone is provided with grooves and furrows.

In order to prevent heating and to grind in the cold, the stationary stone which is preferably above the moving one is cooled by the circulation of water which maintains the apparatus at the desired temperature.

In the accompanying drawing illustrating the invention. Figure 1 is a vertical section taken through the axis of the mill. Fig. 2 is a section on the line A A of Fig. 1, and Figs. 3, 4, 5, 6 and 7 show to a larger scale the working surface of the two millstones and the furrows of the carriers. Figs. 3 and 5 show the fixed millstones and Figs. 4, 6 and 7 the moving stone.

As will be seen the mill consists of two stones or crowns *a* and *b* of hard metal, between which the material to be treated is introduced by a hopper such as *c*. These crowns are attached say by screws to carriers *d* and *e* which may be made of ordinary cast metal and which are provided with furrows *f f'* see Figs. 3 and 4 for the distribution and division of the material between the stones. An inlet to these carriers is moreover provided.

The working surface of the stationary stone is smooth. Upon this surface are formed inlets *g* as shown in Figs. 3 and 5 which latter figure is a section on the line B B of Fig. 3.

The working face of the moving stone *b* is provided with grooves or channels *h* of the shape shown in Figs. 6 and 7 which figures are respectively a partial development to a larger scale of the outer surface of the stone *b* and a section on the line C C of Fig. 4.

The working surface of the stones may be retouched after wear, the difference of thickness being made up by metal rings interposed between them and their carriers.

The upper stone *a* is fixed and the lower *b* is driven. Owing to this well known arrangement there is no fear that through a stop in the feed the stones can come into contact which might give rise to serious accidents.

The upper carrier *d* is connected in any suitable manner to the frame *i* of the mill. The upper portion of the carrier is hollow in order to form a cavity *j* closed by a cover *k* with tight joints *l l'* forming a reservoir of cooling water. The circulation of water is provided for by pipes *m* and *n* separated by a partition *o* which prevents the water escaping before having circulated throughout the cavity *j*.

The material to be treated, is fed to the center of the apparatus by the hopper *c* and falls onto the furrowed distributing plate *p* rotated by the shaft *q* of the moving stone *b*. This plate distributes it uniformly upon the carrier *e*.

On passing out of the milling surfaces of the stones the material falls into the chamber *r* in the frame access to which is rendered possible by means of doors such as *s s'*. A scraper *t* fixed on the carrier *e* directs the material towards the outlet chute *u*.

The shaft *q* upon which the distributing plate *p*, the lower carrier *e* and the driving pulley *v* are keyed rotates in long bearings of antifriction metal. It is supported at the end by a footstep *w* regulatable in all directions by means of screws *x* and a long screw threaded ring *y* provided with handles. This arrangement has the advantage that if the shaft heats it may expand freely in its length downwards, the footstep *w* being brought to the same temperature as the shaft and expanding owing to its method of suspension from top to bottom at the same rate as the shaft.

As above stated the arrangement shown is given only by way of illustration and the mill may be modified in any manner compatible with the principle of the invention.

Claim

A mill having millstones made of hard metal, such as hardened cast iron or steel, one of which is driven and provided with grooves, the other of which and preferably the upper is fixed and provided with a smooth working surface cooled by a water circulation, the said stones being carried by carriers which are provided with distributing furrows the footstep of the shaft carrying the moving stone being adjustable in all directions for allowing of free expansion of the shaft in case of heating without throwing the stone out of adjustment.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

IRÉNÉE ALEXIS CHAVANNE.
BARTHÉLEMY OLLAGNIER.

Witnesses:
JEAN VAUCHER,
H. C. COXE.