

(No Model.)

J. & H. M. CREAGER.

CLAY PULVERIZER.

No. 385,342.

Patented July 3, 1888.

FIG. 1.

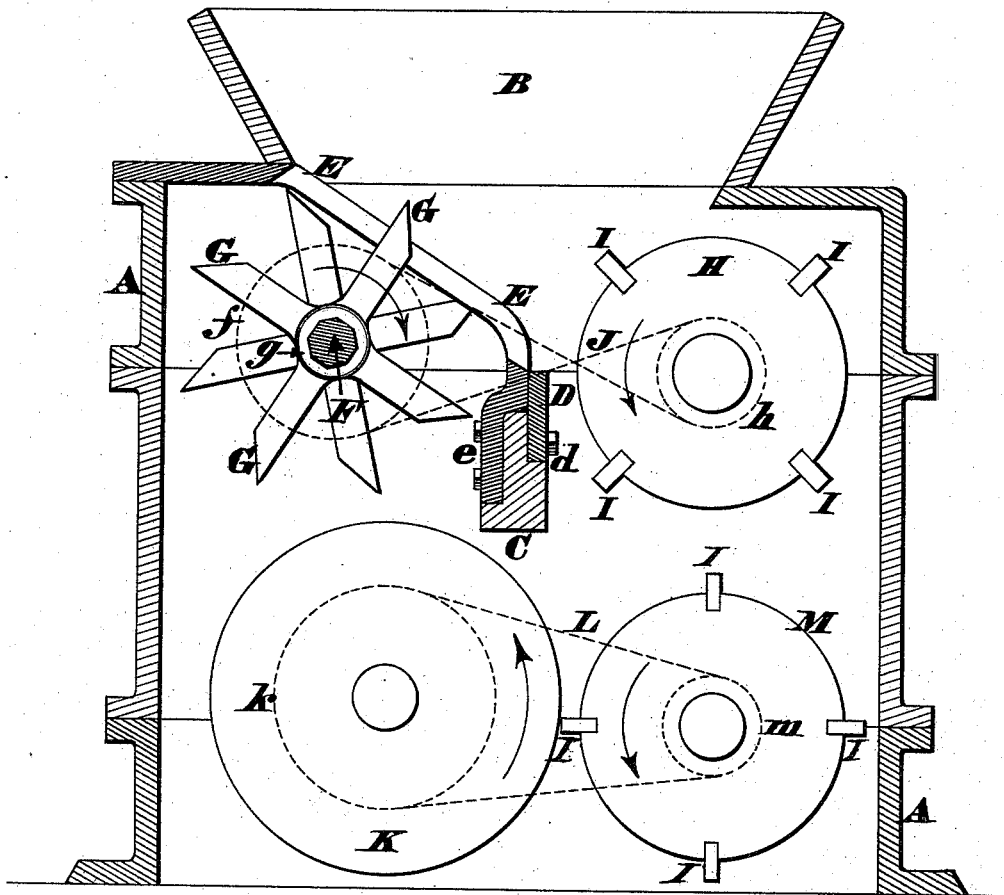


FIG. 2.

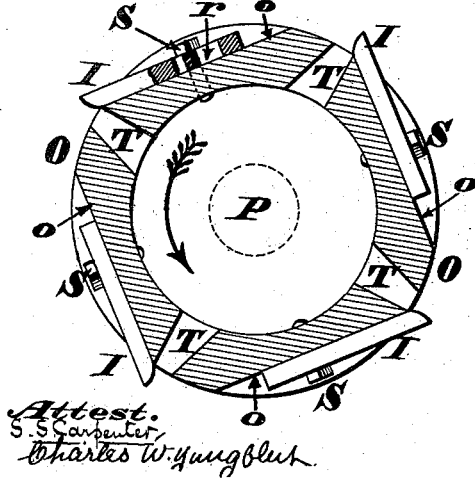
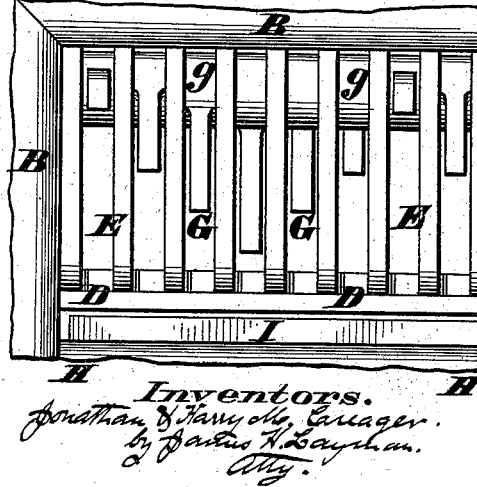


FIG. 3.



# UNITED STATES PATENT OFFICE.

JONATHAN CREAGER AND HARRY M. CREAGER, OF CINCINNATI, OHIO.

## CLAY-PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 385,342, dated July 3, 1888.

Application filed November 3, 1887. Serial No. 254,156. (No model.)

*To all whom it may concern:*

Be it known that we, JONATHAN CREAGER and HARRY M. CREAGER, both citizens of the United States, residing at Cincinnati, in the county of Hamilton, State of Ohio, have invented certain new and useful Improvements in Clay-Pulverizers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to those machines which are employed for grinding or pulverizing clay and other similar materials; and the first part of our improvements comprises a novel combination of inclined grating, blades, knife-cylinder, and fixed cutting-bar, which devices are housed within a suitable casing, box, or frame. The grating curves or slopes downwardly from the hopper toward the fixed bar, and the blades, which are mounted upon a common shaft, revolve within the intervals of said grating, thereby pulverizing the clay, and at the same time forcing it toward said bar, where the material is subjected to the action of the knife-cylinder, as hereinafter more fully described.

The second part of our improvements consists in providing the machine with a set of regrinding-cylinders located below the grating and knife-cylinder, and adapted to reduce the clay to the finest possible condition. Of these regrinding-cylinders, one has a smooth periphery and revolves at a comparatively low speed, while the other cylinder is armed with longitudinal blades or knives and is driven at a higher velocity. Furthermore, the large cylinder revolves in the same direction as the smaller or cutting cylinder, by which arrangement the former serves to loosen up the clay and acts as a shiftable bearing for the knives to operate against, as hereinafter more fully described.

The third part of our improvements consists in providing the cutting-cylinder of a pulverizer with a throat for each of the knives or blades, which throats open into the interior of the cylinder, and thus prevent clay packing solidly under the knives, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a vertical section of our improved pulverizer, the various cylinders of the same being shown

in elevation. Fig. 2 is an enlarged transverse section of our improved knife-cylinder. Fig. 3 is a plan of a portion of the machine.

A represents a suitable box, casing or frame, having at top a hopper, B, and below said hopper a stout bearing, C, to which latter a detachable cutting-bar, D, is secured by bolts *d*.

E represents a grating that curves or slopes downwardly from the hopper B, or from the upper part of the machine to the cutting-bar D, said grating being secured to the bearing C with bolts *e*. Located underneath this grating is a polygonal shaft, F, armed with any approved form of blades G, the latter being separated by washers or hubs *g*, so as to revolve freely between the bars of said grating, as more clearly seen in Fig. 3.

H is a cylinder armed with longitudinal knives I, and having at one end a pulley, (indicated by the dotted circular line *h*,) around which a crossed belt is passed that drives the pulley of shaft F, said belt and pulley being indicated, respectively, by the dotted lines J and *f*. Journaled in the lower part of the machine is a smooth-faced drum or cylinder, K, having a large pulley, (indicated by the dotted circular line *k*,) from which a straight belt, L, leads to the pulley *m* of the secondary cutting-cylinder M, the latter being armed with a series of longitudinal knives, I. The knives I of the cutting-cylinders may be applied in any convenient manner; but we prefer the arrangement seen in Fig. 2, where the cylinder O has a hollow center or chamber, P, and a flat face, *o*, for each of said knives. Furthermore, each knife is slotted longitudinally at *r* to receive a bolt, S, in order that the knife may be shifted outwardly to compensate for the unavoidable wear and tear of the same. The shell of cylinder O is pierced with throats T, located at the leading end of each of the faces *o*, and being preferably wider at their inner than at their outer ends.

The operation of our machine is as follows: The machine being set in motion and the clay or other material being thrown into the hopper B falls upon the grating E, and as the blades G pass through the slots of said grating the clay is necessarily disintegrated by said blades and forced down toward the bar D, it being understood that the shaft F, upon

which these blades are mounted, turns in the direction of the arrow. Consequently a deposit of loose or moderately-pulverized clay accumulates upon said bar, and is then subjected to the action of the knives I, which reduce the material to a much finer condition, which may be all that is necessary for ordinary purposes; but a further reduction is permitted by the use of the secondary cylinders K M. As one of these cylinders drives the other by means of a straight belt, it is evident they both revolve in the same direction, and on this account while the periphery of cylinder M is turning down the adjacent periphery of cylinder K is turning up, as indicated by the arrows. It will thus be seen that the cylinder K acts as a shiftable bearing that affords a new surface for the knives to operate against, besides which the upward turning of said cylinder loosens the clay and prevents it packing within the pulverizer or hopper. Therefore the cylinder is not liable to be worn hollow in places, and on this account it will last indefinitely. As a result of this regrinding by the secondary rollers the clay is pulverized so finely as to be used for pottery and other similar purposes. The throats T of the grinding-cylinders prevent any packing of clay under the knives, the material being driven into said passages, from whence it is projected by centrifugal velocity; but if the cylinder is running at a very low speed this clay will enter the chamber P, and can then be removed at suitable intervals.

We claim as our invention—

1. The combination, in a pulverizer, of cutting-bar D, a grating, E, sloping down to said bar, blades G, operating within the slots of said grating, and a cylinder, H, having knives I, which knives reduce the clay, as described. 35 40

2. The combination, in a pulverizer, of a pair of regrinding-cylinders, K M, the cylinder K having a smooth periphery and revolving in the same direction as the other cylinder, M, which latter is armed with knives or cutters I, as herein described. 45

3. A grinding-cylinder having a chamber, P, knives I, and throats T, which latter communicate with said chamber, as herein described. 50

4. The combination, in a pulverizer, of cutting-bar D, inclined grating E, blades G, main cutting-cylinder H, and regrinding-cylinders K M, as described.

5. A grinding-cylinder having a chamber, P, throats T, and flat faces o, to which faces the slotted knives I r are secured by bolts S, as herein described. 55

In testimony whereof we affix our signatures in presence of two witnesses.

JONATHAN CREAGER.  
HARRY M. CREAGER.

Witnesses:

JAMES H. LAYMAN,  
SAM'L. S. CARPENTER.