

(No Model.)

G. POTTS.
CLAY DISINTEGRATOR.

No. 384,278.

Patented June 12, 1888.

Fig. 1.

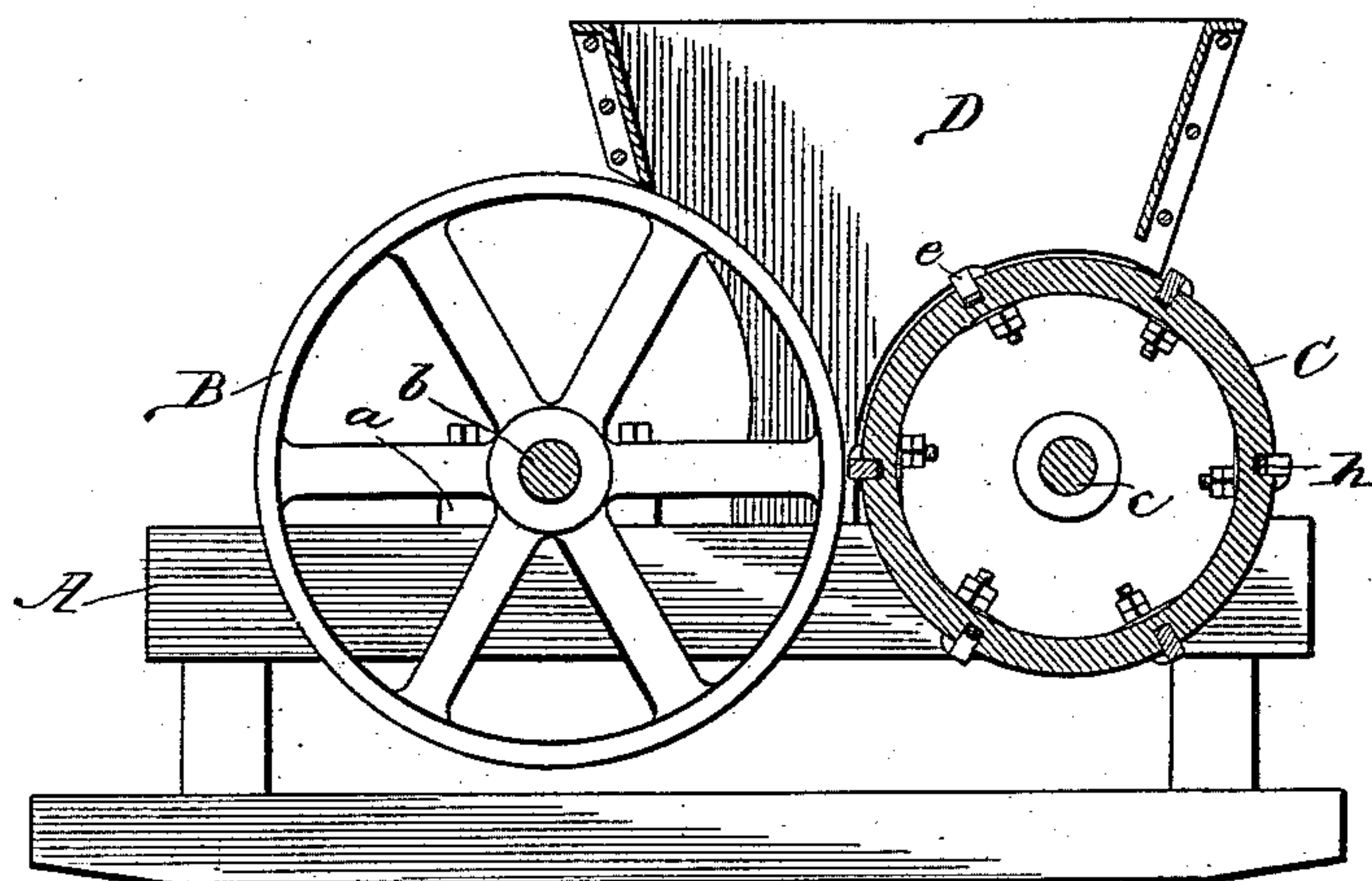


Fig. 2.

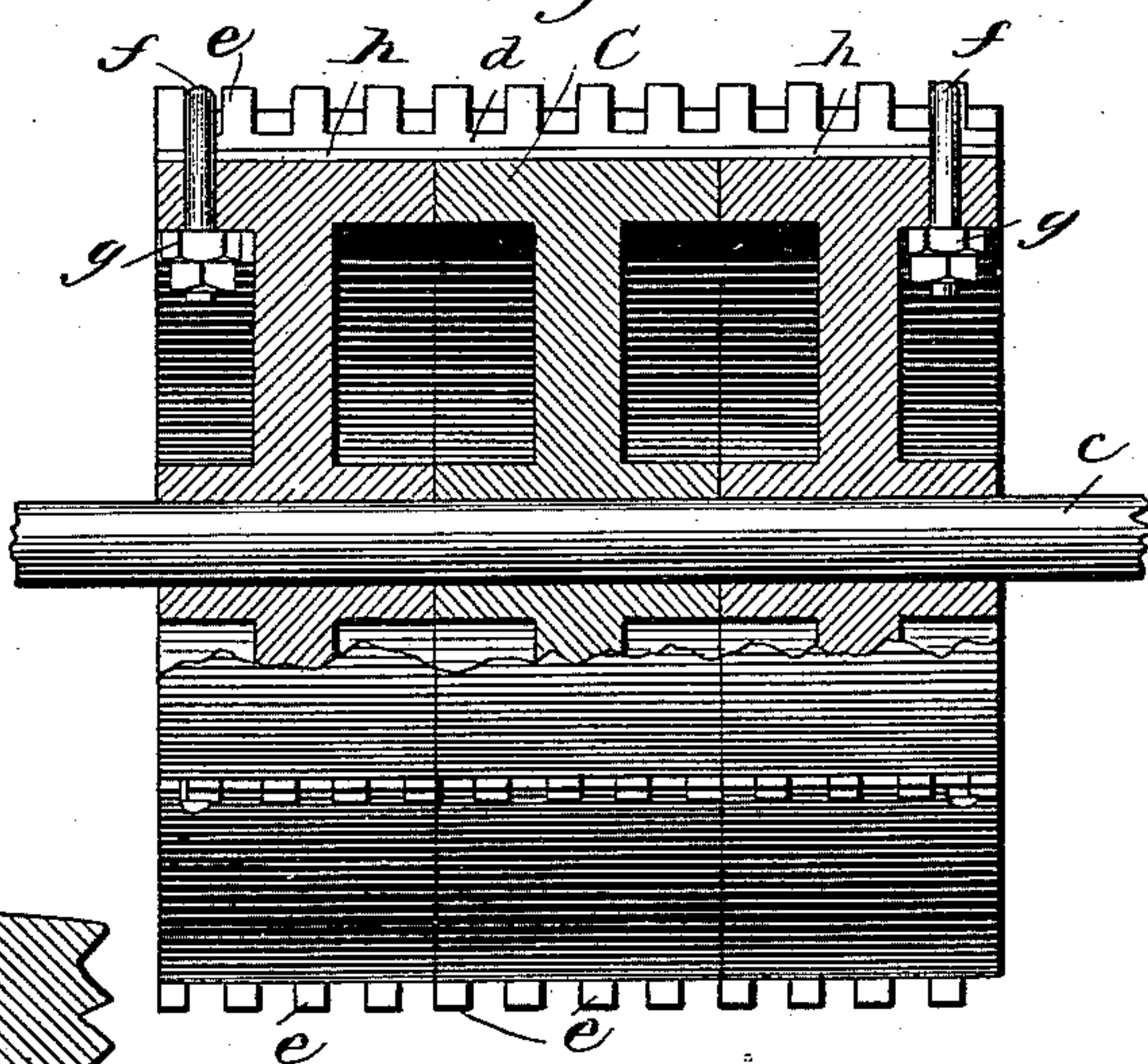


Fig. 3.

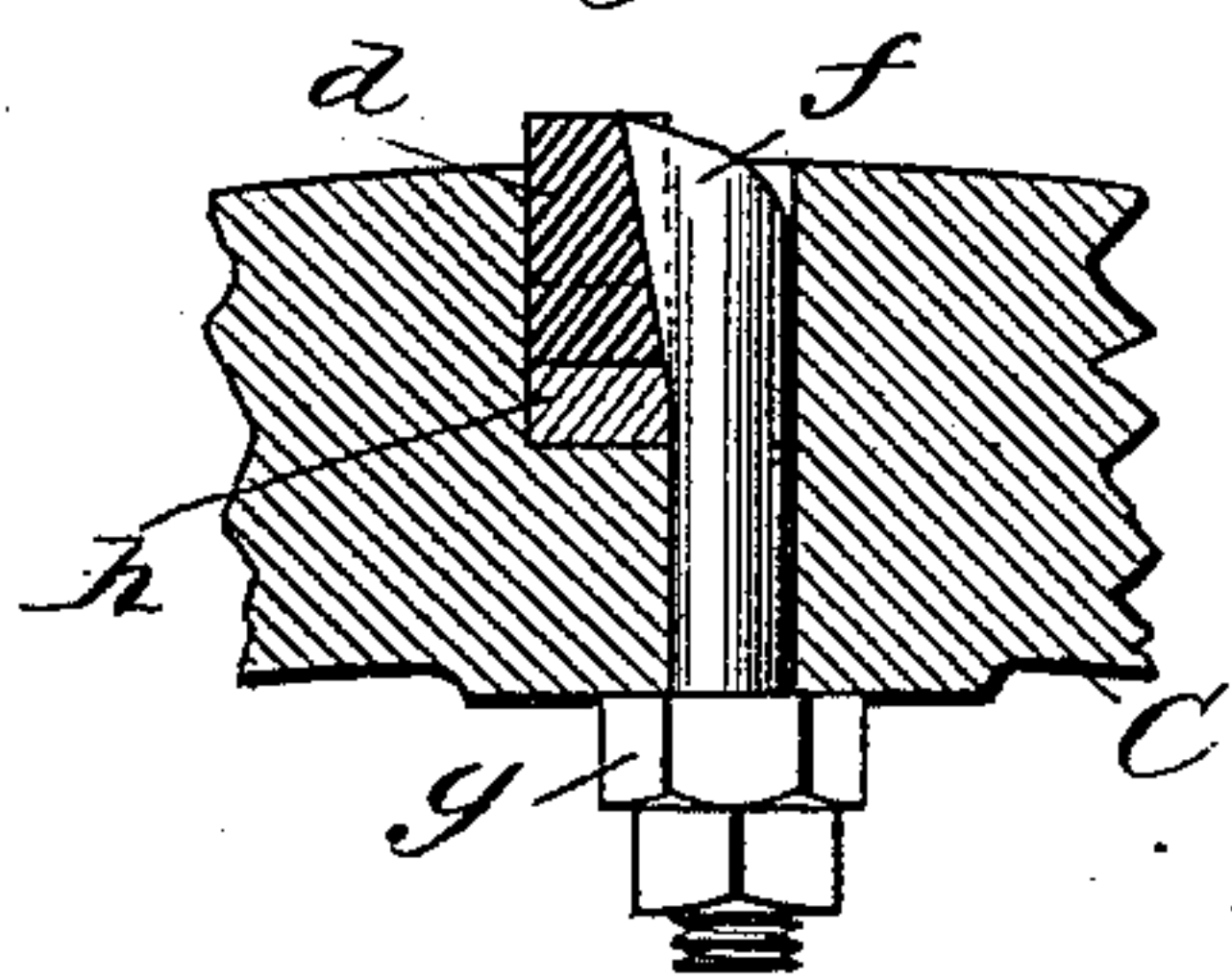
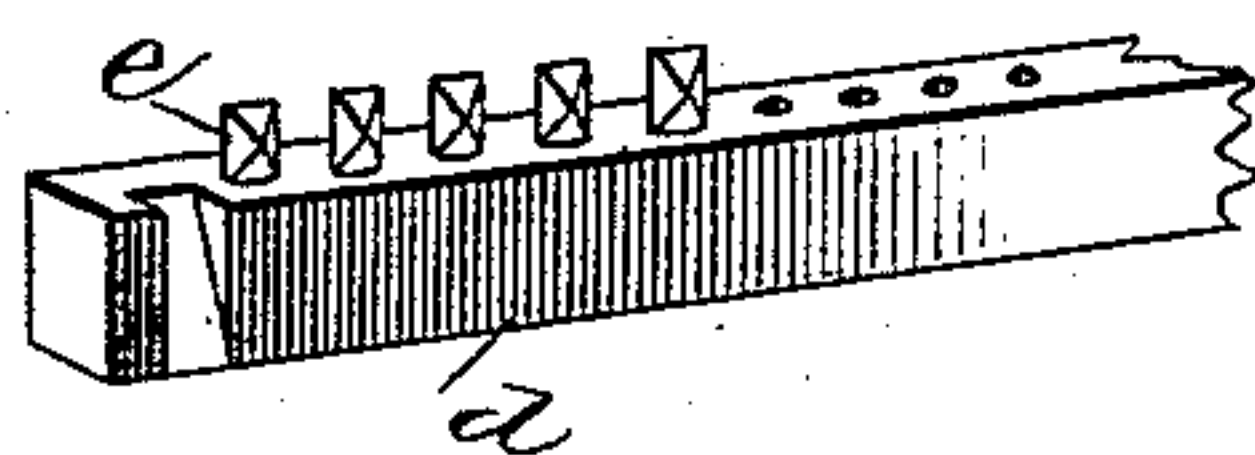


Fig. 4.



Witnesses.

W. Rossiter
J. Mills.

Inventor
George Potts

By *David Fisher*
Atty.

UNITED STATES PATENT OFFICE.

GEORGE POTTS, OF INDIANAPOLIS, INDIANA.

CLAY-DISINTEGRATOR.

SPECIFICATION forming part of Letters Patent No. 384,278, dated June 12, 1888.

Application filed August 15, 1887. Serial No. 246,944. (No model.)

To all whom it may concern:

Be it known that I, GEORGE POTTS, of Indianapolis, in the county of Marion, State of Indiana, have invented certain new and useful Improvements in Clay-Disintegrators, of which the following is hereby declared to be a full, clear, and exact description, sufficient to enable others skilled in the art to make and use the same.

My invention relates to machines for clipping or shredding raw clay as it is taken from the bed or bank, so as to disintegrate the same and enable it to be quickly tempered and reduced to proper condition for molding into bricks, tile, or the like. Prior to the use of this class of machines it was frequently the practice to subject the raw clay to a "weathering" process during the winter months and to complete its reduction thereafter by tedious treatment in the well-known grinding-pit. Were attempt made to pass the raw clay directly through a set of crushing-rolls and thence to a pug-mill for tempering it was found that the rolls not only failed to reduce the clay to the homogenous state desired, but, with wet sticky clays, tended to squeeze or compress the same into sheets during passage through the rolls, so that the proper tempering of the clay thereafter by the pug-mill or otherwise was seriously resisted or impaired. By cutting or clipping the clay into shreds, as distinguished from a mere crushing and squeezing action, the disintegration of the mass is not only more complete and homogeneous, causing the diverse strata or pockets existing in the clay-bed to be distributed through and through the product, but the shreds, instead of being compacted, are ruptured and left open to the easy penetration of the water by capillary attraction at the section faces, thus promoting the rapid and even tempering of the clay and accomplishing, substantially, in very brief time what the old weathering treatment required weeks to effect.

The invention relates more especially to that type of clay-disintegrators consisting of a set of rolls mounted in a common frame and positively revolved in opposite direction, one of the rolls having a series of cutter-bars projecting longitudinally therefrom at intervals about

the surface thereof, so that in co-operation the clay is clipped or shredded by the action of the cutter-bars as it is fed or advanced between and through the rolls.

The purpose of the invention is to reduce the power necessary to drive the disintegrator, more especially in working wet sticky clays, or, what is the same in result, to reduce the resistance encountered by the cutter-bars in operation; and to this end the invention consists in providing the shredding-cylinder with cutter-bars of peculiar construction, and, also, in the combination, with such cylinder so provided, of a companion smooth-faced cylinder set in the same frame and positively revolved in opposite direction thereto.

The invention further consists of certain improvements in detail construction, all of which will fully appear from the description following, and be thereafter more distinctly pointed out in the claims at the conclusion thereof.

In the accompanying drawings, forming part of this specification, Figure 1 is a view in longitudinal section of a clay-disintegrator embodying my improvements. Fig. 2 is a detail view, partly in section and partly in plan, of the shredding-cylinder detached. Fig. 3 is a detail view, in section, showing the manner of securing the cutter-bars in place. Fig. 4 is a perspective view of a modified form of the cutter-bar.

Mounted upon the frame A, of any convenient construction suitable for the purpose, are the companion cylinders or rolls B C. These cylinders are preferably of cast-iron and have their axles *b c* journaled in suitable boxes or bearings, as at *a*, secured to the main frame A, thus permitting the easy revolution of the rolls B C during the operation of the machine. The cylinders B C can be geared and driven in any well-known way, a convenient and efficient means for this purpose being set forth in the patent of C. and A. Potts, for improvements in disintegrators, No. 368,898, dated August 23, 1887. It is merely necessary that the cylinders B C shall move in opposite directions, so as to advance the raw clay from the hopper D through and between the rolls at the same time that the cutter-bars *d* of the cylinders C are performing their peculiar function of

shredding or clipping the clay. It is preferred that the cylinder B shall be somewhat larger in diameter than the cylinder C, and shall move at less speed than the latter, so that while the feeding of the clay occurs it will not be so rapid as to prevent the thorough shredding of the mass, which is desired. It is not essential, however, that the cylinder shall be of different size, and in some cases the portions may be reversed, making the shredding-cylinder larger in diameter than the companion roll.

In the application of C. and A. Potts referred to the cutter-bars *d* each consist of a straight blade having a continuous edge set within a longitudinal seat or recess of the cylinder and securely retained therein with the cutting-edge projecting slightly above the face of the cylinder. By the present invention the cutter-bars, instead of presenting a single straight-edge to the face of the companion cylinder B, are indented, as shown, so as to form a series of teeth, *e*, projecting beyond the surface of the cylinder C. The indentations in the successive bars of the series about the circuit of the cylinder are interspaced, so that the teeth of one bar shall stand opposite to the spaces of the next bar in the traverse of the cylinder.

In working wet sticky clays, when the cutter-bars have a continuous straight edge, the resistance encountered by the bars in course of their revolution from the clay very considerably increases the amount of power necessary to drive the machine at the proper speed for feeding and disintegration. By indenting the bars, however, as in the present invention, the resistance encountered is much lessened at the same time that the crowns or upper edges of the teeth act, as before, to clip or shred the clay in manner desired. Such parts of the mass of clay as remain uncut by the teeth of one bar are almost immediately thereafter shredded by the teeth of the succeeding bar, so that the result is to speedily disintegrate the clay, with the same benefit as was derived from the Potts machine, above named, at the same time that the resistance is lessened because of the indented nature of the cutter-bar. It is important that the bars shall be securely retained in position about the cylinder and be capable of easy removal when worn or broken. A convenient expedient for the purpose consists in beveling the face of each bar *d* near each end, and providing a bolt, *f*, with a corresponding bevel-face to engage with the bevel-kerf of the cutter-bar. The bar being inserted in its seat or channel in the cylinder C, the bolt *f* is thrust through a hole in the cylinder adjacent to the longitudinal channel and screwed down with its bevel-face bearing upon the bevel-face of the cutter-bar by means of the usual nut, as at *g*. A set-nut serves to lock the bolt firmly in place. It will be understood that this plan of securing the cutter-bars, although simple and compact, is not an essential. Any other expedient for holding the bars may be adopted and the advantages inci-

dent to the indenting of the bar be yet retained. A liner or packing, *h*, may rest in the channel or groove of the cylinder C below the cutter-bars *d*, to secure a firm bearing and ready adjustment for the bars, if desired. Instead of having the teeth *e* cut from the body of the bar *d*, this latter may be separate, as shown in Fig. 4, and the teeth *e* be secured therein by screw-shank or otherwise. In this construction the crowns of the teeth co-operate with the revolving cylinder B to clip or shred the clay, with the same result as if the teeth were in piece with the body of the cutter-bar. Instead of having the teeth *e* mounted separate from the body of the cylinder C, such teeth may be set directly in the face of the cylinder itself, although such plan is inferior and is not to be recommended for the best results. It is evident that the cutter-bars, instead of extending in one piece longitudinally from end to end, may be made in sections, and may also be "staggered" across the face of the cylinder, if desired.

A set of clay-crushing rolls has heretofore been devised wherein the rolls were armed peripherally with a series of projecting teeth extending along the surface thereof; but in such device the projecting teeth were not furnished with cutting-edges to clip the clay, as in my invention, but had broad flat crowns, whereby the clay was merely reduced or crushed by a "pugging" action, and was not cut and shredded, as designed by me.

Having thus described the invention, what I claim as new is—

1. In clay-disintegrators, the combination, with a rotating cylinder having an abutting surface set opposite thereto and co-operating therewith to feed and shred the clay, of a series of teeth projecting beyond said cylinder and furnished with longitudinal cutting edges or crowns at the outer ends thereof, whereby the clay may be clipped or shredded as the same is fed by the cylinder, substantially as described.

2. In clay-disintegrators, the combination, with a rotating cylinder having an abutting surface set opposite thereto and co-operating therewith to feed and shred the clay, of the longitudinal bars retained by said cylinder, and the series of interspaced teeth projecting from said bars and beyond the surface of the cylinder, said teeth being furnished with cutting edges or crowns at the outer ends thereof to coact with the abutting surface and clip or shred the clay as the same is fed by the cylinder, substantially as described.

3. In clay-disintegrators, the combination, with the main frame, and with a rotating cylinder fixed therein and having longitudinal toothed cutting-bars projecting beyond the face thereof, of a positively-revolving companion cylinder fixed opposite thereto in said frame, and having a smooth face with which said cutting-bars directly co-operate to shred the clay as the same is fed between said cylinders, substantially as described.

4. In clay-disintegrators, the combination,
with the main supporting-frame, of a rotating
cylinder having longitudinal bars retained
therein and a series of teeth projecting from
5 said bars beyond the surface of the cylinder
with cutting-crowns at the outer edges of said
teeth, and a positively - revolving companion
cylinder fixed in said frame, and having a

smooth face with which the cutting-teeth di-
rectly co-operate to shred the clay as the same is
fed between the cylinders, substantially as
described.

GEORGE POTTS.

Witnesses:

LINDLEY VINTON,
CLAYTON POTTS.