(No Model.)

C. & A. POTTS.

CLAY DISINTEGRATOR.

No. 368,898. Patented Aug. 23, 1887.

Fig. 1.

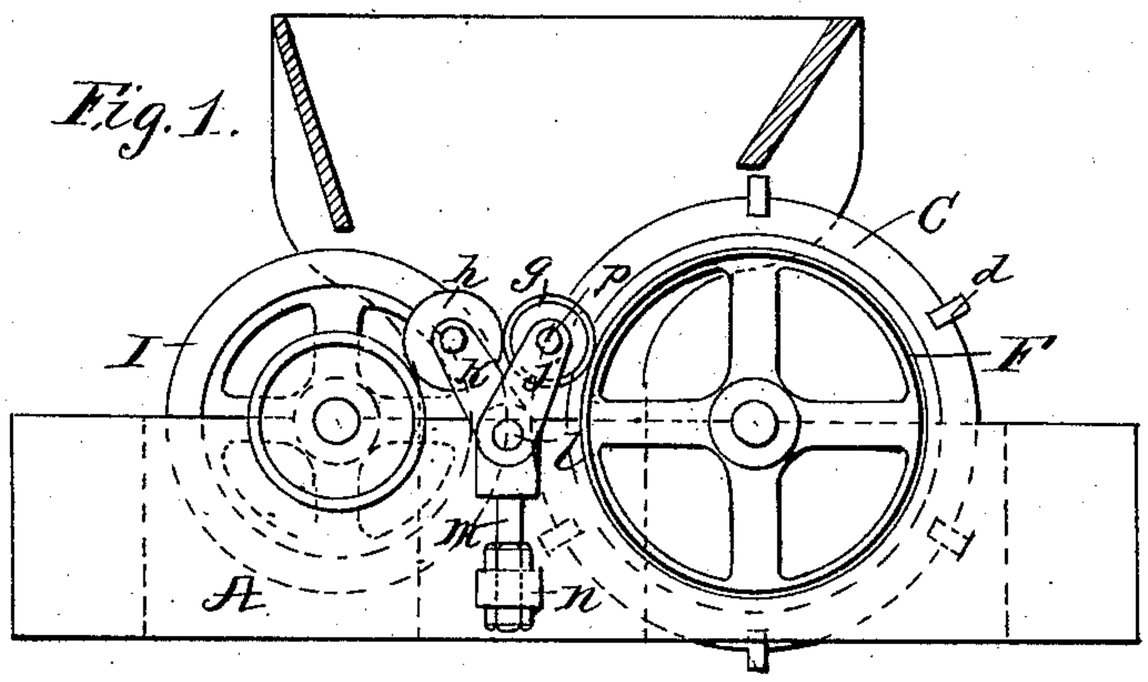


Fig. 2.

Fig. 4.

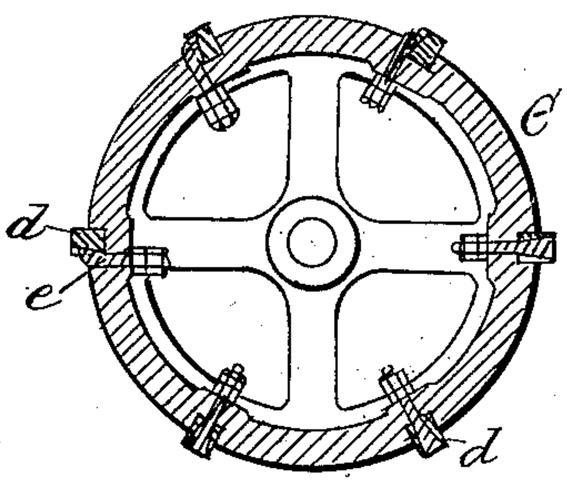
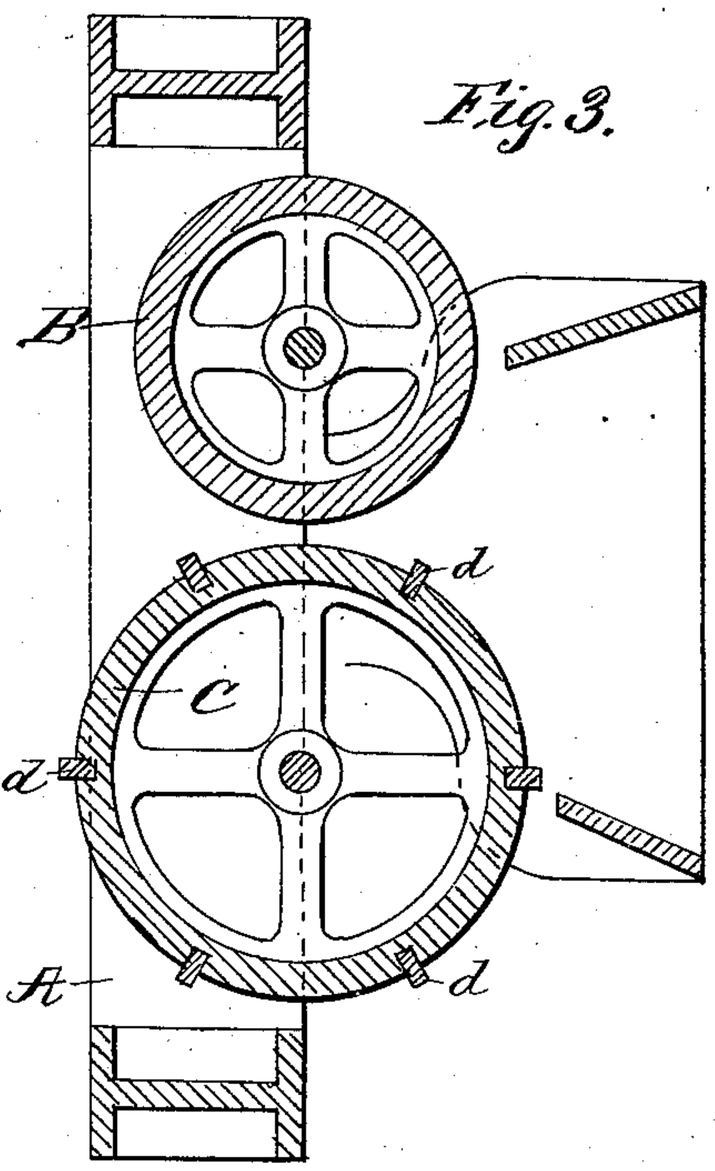


Fig. 3.



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UNITED STATES PATENT OFFICE.

CLAYTON POTTS AND ALBERT POTTS, OF INDIANAPOLIS, INDIANA.

CLAY-DISINTEGRATOR.

SPECIFICATION forming part of Letters Patent No. 368,898, dated August 23, 1887.

Application filed October 18, 1886. Serial No. 216,472. (No model.)

To all whom it may concern:

Be it known that we, CLAYTON POTTS and ALBERT 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.

Our invention relates to disintegrators of that class employed in the preparation of clay for the manufacture of brick, tile, and the like; and it consists more especially of certain improvements in the construction of disintegrators such as is set forth in our Letters Patent No. 322,393, dated July 14, 1885.

In lieu of the swinging plate shown by said patent, co-operating with the revolving cutter-cylinder, we design to employ a plain cylinder set oppositely to the cutting-cylinder and revolving therewith in close proximity, so that the raw clay may be fed, shredded, and discharged in an even and continuous manner, in readiness to be taken directly to the pug or other mill. The drive-pulleys mounted on the respective axes of the cylinders are in operative connection through the medium of friction-pulleys bearing thereon, so that if the movement of the two cylinders in course of revolution shall be seriously arrested or impeded by stone or the like choking in the throat of the mill the friction-gear will serve to relieve the strain by slipping upon the cylinder-pulleys.

The invention consists, further, in certain detail improvements in the construction and arrangement of the frictional driving mechanism and in the plan for securing the cutter-bars within the seats of the shredding-cylinder.

In the accompanying drawings, Figure 1 is a view in side elevation, the feed-trough being shown in section, of a disintegrator embodying our improvements. Fig. 2 is a top plan view thereof, and Fig. 3 a view in longitudinal vertical section. Fig. 4 is a detail view in cross-section of the cylinder having the cutter-bars seated therein.

Within the usual boxes and bearings, *a*, of the frame A are seated the axles *b* and *c* of what may be termed for distinction "feed-cylinder" B and the "cutting-cylinder" C, although, as will hereinafter appear, the cylinder B not only feeds the clay, but presents it for cutting, while the cylinder C not only cuts the clay, but coacts with the cylinder B in feeding the same continuously through the machine. These cylinders are preferably of metal, and are arranged in near relation to each other, so that the clay passing between them shall be finely divided or shredded. For this purpose the cutting-cylinder C is provided about its face with a series of cutter-bars, *d*, which, in the form shown, consist of straight steel plates set in the channels or longitudinal grooves of the cylinder C. There may be liners of soft metal arranged in the cylinder-seats below the cutter-bars *d*, to secure an even bearing and adjustment for said bars. Bevel-like kerfs cut in the bars near the outer ends thereof contact with the correspondingly-beveled faces of the bolts *e*, projecting through the cylinder C, and provided with the set or lock nuts at the inner ends thereof. By screwing down the nuts on the bolts *e* the cutter-bars *d* will be drawn snugly and securely to their seats in the cylinder C, and be thus retained firmly in place.

It is manifest that by having the bars removable, as shown, they may be taken out when worn or broken and new ones substituted in place thereof. Slight inequalities in the wear of the cutter-bar *d* may be compensated by the use of the liners, as above indicated. Instead of having the bars replaceable, they may be cast in piece with the cylinder C, although such form is not to be preferred, because on wear or breakage of the projections *d* the entire cylinder must be dispensed with. Instead of having the cutter-bars straight and mounted in longitudinal channels across the entire length of the cylinder C, such bars may be short and set in staggered or zigzag fashion across the face of the cylinder. Whatever kind of cutter-bar *d* be adopted, the purpose is to arrange such bars so as to project slightly from the face of the revolving cylinder C and barely clear the face of the opposite cylinder, B. Under this arrangement, as the cylinder revolves, the bars *d* cut away the clay in successive shred-like portions as the same is pressed against the cylinder. It will be understood that the diameter of the feed-cylinder B may be larger or smaller than that of the cutting-cylinder C, or, again, that both cylinders may be made of the same diameter. By having the cutting-cylinder C smaller in diameter than that of the feed-cylinder B the cutting-cylinder may be caused

to revolve more rapidly than the companion cylinder B, to effect an even feed at the same time that the cutters *d* are presented in quick succession to more finely shred or divide the passing clay. A pulley, F, secured to the opposite end of the axle *c* and rotating therewith, imparts movement, by the idler-pulleys *g* and *h*, to the pulley I, secured to the axle of the feed-cylinder B. The idler-pulleys *g h* are mounted in swinging arms or frames *j k*, moving pivotally upon a through-bolt or stud-like pivot, *l*, projecting from the head of the standard *m*, which latter passes through an eye, *n*, of the frame A.

It will be seen that the pulleys F and I are respectively in frictional contact with the idler-pulleys *g h*, which latter, in like manner, are in frictional contact with each other. By adjusting the standard *m* through the set and jam nuts resting upon the supporting-eye *n*, the idler-pulleys *g h* are made to bear more or less firmly against each other and against the pulleys F I, respectively, by which means the degree of frictional contact and driving strain between the cutting-cylinder C and the feed-cylinder B may be varied.

During the ordinary operations of the machine in shredding the clay the frictional contact of the various pulleys named will serve to drive the cylinders and to shred the clay as desired. If any obstruction should be encountered tending to choke or clog the space between the two cylinders, the frictional contact of the driving-pulleys will permit a slip to occur, so that strain on the parts and the danger of breakage which are incurred were the two cylinders to be positively geared together by the ordinary tooth-pinion are avoided.

As before stated, the machine shown in our Letters Patent No. 322,393 was provided with a swinging or vibrating plate to coact with the cutting-cylinder in effecting the shredding of the clay which was fed between them. In such machine the abutting surface of the vibratory plate furnished a rest or bearing for the clay in presenting the same to the action of the cutter-knives. This abutting surface was limited in extent and unchanging in position, so that it became rapidly worn. By substituting the revolving roll for the vibrating plate this objection is greatly lessened. The roll constantly presents new surfaces to the cutters, so that the wear is even and regular throughout its circuit. If any inequalities exist in the roll at the outset, these become rapidly reduced, so that by use the cylinder wears more and more true, and acts thus with constantly better effect. Aside from cheapness in construction, the revolving roll or cylinder machine will work wet or sticky clays with perhaps one-third of the power necessary in treating such clays in the vibratory-plate machine. Such plate tends constantly to crowd or squeeze the passing clays, whereas the revolving roll yields continuously, so that clogging is less apt to occur at the same time that the clay is finely and evenly shredded, the cutter-cylinder moving, by preference, more rapidly than the companion feed-roll in order to accomplish this effect.

Prior to our invention it has been very common to employ in clay-mills, sugar-mills, and the like a set of rolls between which the material passed as the rolls were revolved; but in such machines the operation of the rolls was merely to break up the clogs of clay and squeeze or crush the same, whereas by our invention the clay is positively cut into fine shreds or clippings in much better condition to be tempered and molded than by the old forms of disintegrating-machines.

We do not wish to be understood as claiming, broadly, the use of a friction-gear to control the strain upon the operating parts of a clay-disintegrator. Such kind of gearing is shown and described in our Patent No. 322,393, but there only in connection with the swinging plate and cutter-cylinder. By our present improvements such friction-gear is modified in construction and adapted for use in conjunction with the companion rolls, and our present invention is restricted to the new combination of such rolls and friction-gear.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In the supporting-frame of a clay-disintegrator, a rotating cylinder longitudinally grooved and carrying cutting-bars in and projecting beyond the grooves, in combination with a smooth-faced rotating cylinder adapted to carry and hold the clay against the cylinder having the cutting-bars thereon, which latter cut or shred the clay and pass the same between the cylinders, substantially as set forth.

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

3. In a clay-disintegrator, the combination, with the main or cylinder pulleys, of the intermediate pulleys mounted in oppositely-swinging arms, and means, substantially as described, to adjust the position of said arms, whereby the frictional contact of said pulleys with each other and with the cylinder-pulleys may be varied, substantially as described.

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