(No Model.)

M. & J. BIERLINE.

CLAY CRUSHER AND TEMPERER.

No. 368,643. Patented Aug. 23, 1887.

Fig. 3

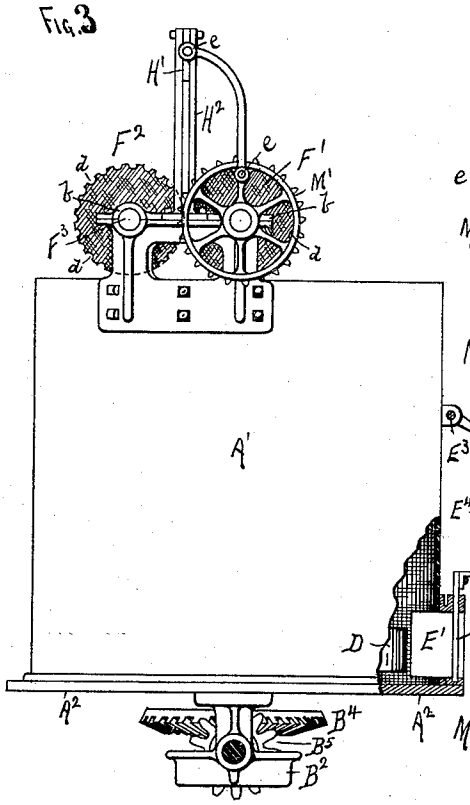


Fig. 1

Fig. 4

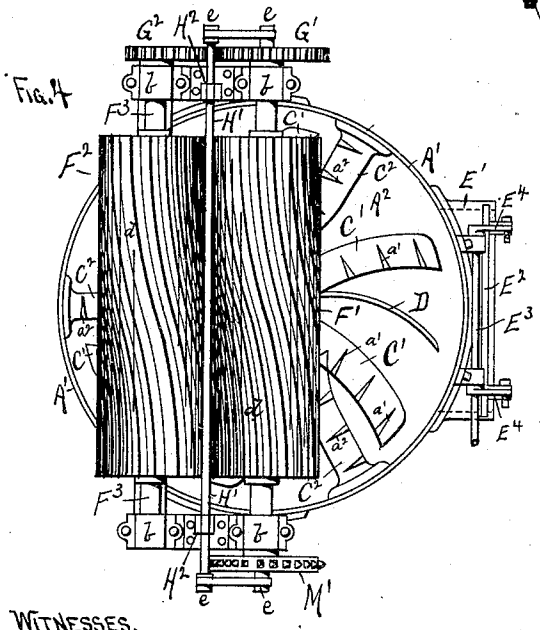
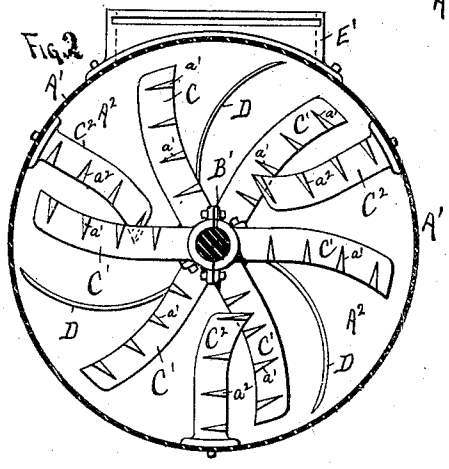


Fig. 2



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UNITED STATES PATENT OFFICE.

MICHAEL BIERLINE AND JACOB BIERLINE, OF CHASKA, MINNESOTA.

CLAY CRUSHER AND TEMPERER.

SPECIFICATION forming part of Letters Patent No. 368,643, dated August 23, 1887.

Application filed April 28, 1887. Serial No. 236,410. (No model.)

To all whom it may concern:

Be it known that we, MICHAEL BIERLINE and JACOB BIERLINE, both citizens of the United States, and both residing at Chaska, in the county of Carver and State of Minnesota, have jointly invented certain new and useful Improvements in Machines for Crushing and Tempering Clay, of which the following specification is a full, clear, and exact description, reference being also had to the accompanying drawings.

This invention relates to machines for crushing and tempering clay prior to its being prepared for the process of molding into bricks, tiles, &c.; and it consists in the construction, combination, and arrangement of parts, as hereinafter shown and described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a rear elevation in transverse section. Fig. 2 is a plan view in section. Fig. 3 is a side elevation of the machine with the supporting-trucks removed. Fig. 4 is a plan view of Fig. 3.

A′ is the outer casing or shell of the mixing-drum, resting on a platform, A^2, the latter suitably mounted upon wheels A^3, adapted to run upon tracks, so that the machine may be easily moved from place to place.

B′ is an upright shaft stepped in a bridge-tree, B^2, beneath the platform A^2, and passing upward through the center of the casing, and supported at its upper end by another bridge-tree, B^3, the latter secured by its ends to the interior of the casing A′. This shaft B′ is adapted to be driven by gears B^4 B^5, or by any other suitable means, and is provided at regular intervals inside the casing with arms C′, armed with teeth *a′*, the teeth being pointed and projecting upward and downward from the arms C′, and adapted to be revolved with the arms between similar teeth, a^2, on arms C^2, attached permanently to and projecting inward from the interior of the casing A′.

The two sets of teeth a' a^2 are set so that they will not come in contact when the arms C′ are revolved, but will pass each other in close proximity.

Each of the teeth is flat upon one side, and the flat sides of the teeth a' are adapted to be moved toward the flat sides of the teeth a^2, so that the particles of the clay will be disintegrated, but not cut by the teeth.

On the lower end of the shaft B′, just above the platform A^2, are secured a series of curved blades, D, adapted to sweep the tempered clay out through the opening E′ in the side of the casing A′, into any suitable receptacle, or, which will more generally be the case, into the mixer of the brick-machines. This mixer is not shown in the drawings, as it forms no part of the present invention, and may be of any of the well-known forms of construction.

This machine is adaptable to any form of brick-machine, or may be used in connection with the process of making bricks by hand.

Above the casing A′ two rolls, F′ F^2, are mounted in suitable bearings, *b*, and adapted to be revolved by differential gears, G′ G^2, so that the rolls will run at different speeds and exert a cutting effect upon the clay which is passed between them. The rolls are formed with spiral grooves *d*, as shown, the grooves running in the same direction in both rolls, so that the clay will be passed between them without being crowded toward one end, as would be the case if the grooves were formed in opposite relations.

Above the rolls F′ F^2 a bar, H′, is arranged and adapted to be alternately raised and lowered in ways H^2 by crank-pins *e* on the gear G′, and the sprocket-wheel M′, the sprocket-wheel adapted to impart motion to the shaft B′ through the chain M^2, sprocket-wheel M^3, and bevel-gearing B^4 B^5.

The power may be applied to the machine at any convenient point, but preferably to the shaft F^3 of the roll F^2, and from thence, through the gears G′ G^2 and the sprocket-wheels and chain M′ M^2 M^3 and the gears B^4 B^5, to the shaft B′, as shown, although the mechanism may be arranged in any other manner desired that will secure the desired results.

A hopper will be arranged above the rolls F′ F^2, into which the clay will be fed, this hopper not being shown in the drawings, as it is not an essential part of the invention, and its presence would obscure some of the parts.

The clay as it is fed to the rolls is in the form of large unwieldy lumps, and before it is passed to the mixer of the brick-machines, or to the mixer when the bricks are to be molded by hand, it is desirable that it be reduced to small particles and thoroughly mixed and disintegrated, or what is known as "tem-

pered," so that the after process of preparing it more directly for manufacture into bricks may be more readily accomplished, and to thus reduce the clay to the proper consistency is the function of the machine herein described.

The clay as it falls upon the rolls is forced down between them by the rising and falling bar H′ and caught by the corrugations *b* in the rolls and reduced to small particles and passed down into the casing A′, where it is caught by the teeth a' a^2 and the particles separated and thoroughly mixed and disintegrated and tempered, or rendered "homogeneous," so that the after process of preparing it for the molds is rendered much more easy of accomplishment and requiring less time and labor.

The exit-port E′ of the drum A′ is shown provided with a cover, E^2, adapted to be adjusted by a rock-shaft, E^3, and connecting-rods E^4, or by other means, so as to control the output of the machine.

Having described our invention and set forth its merits, what we claim is—

1. In a machine for crushing and tempering clay, the combination of the drum A′, having stationary toothed arms C^2, central revolving shaft, B′, having toothed arms C′ alternating with said stationary arms, sweeps D upon the lower part of said shaft within said drum and adapted to force the clay from said drum, revolving fluted rolls F' F^2 above said drum, adapted to crush the clay as it passes to said drum, and a rising and falling bar, H′, adapted to force the clay into contact with said rolls, substantially as and for the purpose set forth.

2. In a machine for crushing and tempering clay and similar materials, a drum, A′, in which the crushed clay or other material is adapted to be disintegrated, in combination with fluted rolls F' F^2, mounted above said drum, between which the clay is caused to pass, in combination with a bar, H′, adapted to be raised and lowered above said rolls to force the clay into surface contact with said rolls and insure its passage between them, substantially as set forth.

3. In a machine for crushing and tempering clay and similar material, a drum, A′, having stationary arms C^2 projecting inward from its interior, and a central shaft, B, having radiating arms C′ alternating with said stationary arms, each of said stationary arms C^2 having teeth a^2, with one side flattened, and each of said revolving arms C′ having teeth a', with one side flattened, the flattened sides of the teeth on the arms C′ adapted to be moved toward the flattened sides of the teeth on the arms C^2, so that the clay being acted upon is crushed and disintegrated without being cut or pulverized, substantially as and for the purpose set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

MICHAEL BIERLINE.
JACOB BIERLINE.

Witnesses:
GEO. A. DUTOIT,
O. W. LUNDSTEN.