(No Model.) 3 Sheets—Sheet 1.

F. E. FREY.

CLAY CRUSHING MACHINE.

No. 295,533. Patented Mar. 25, 1884.

Fig. 1.

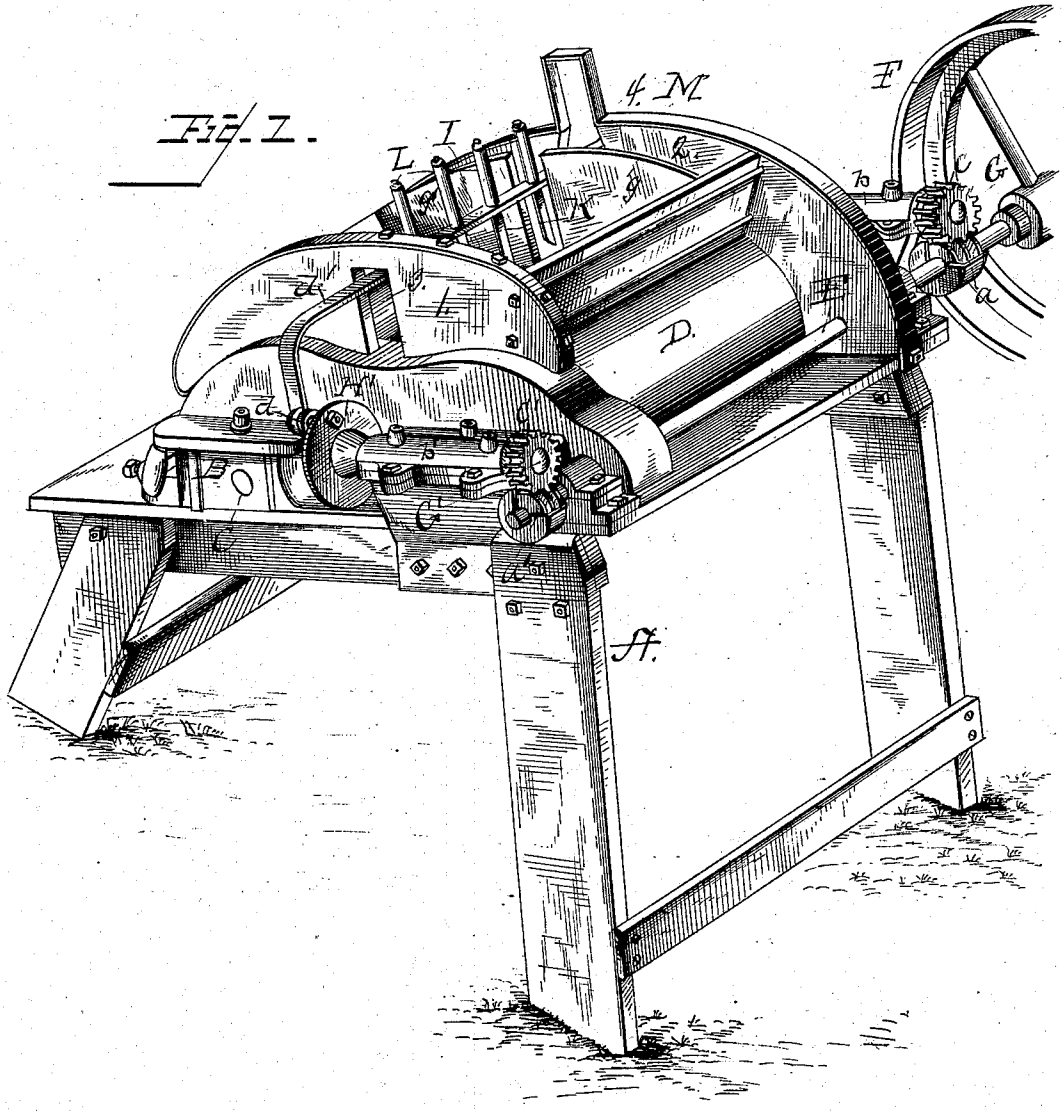

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Fig. 2.

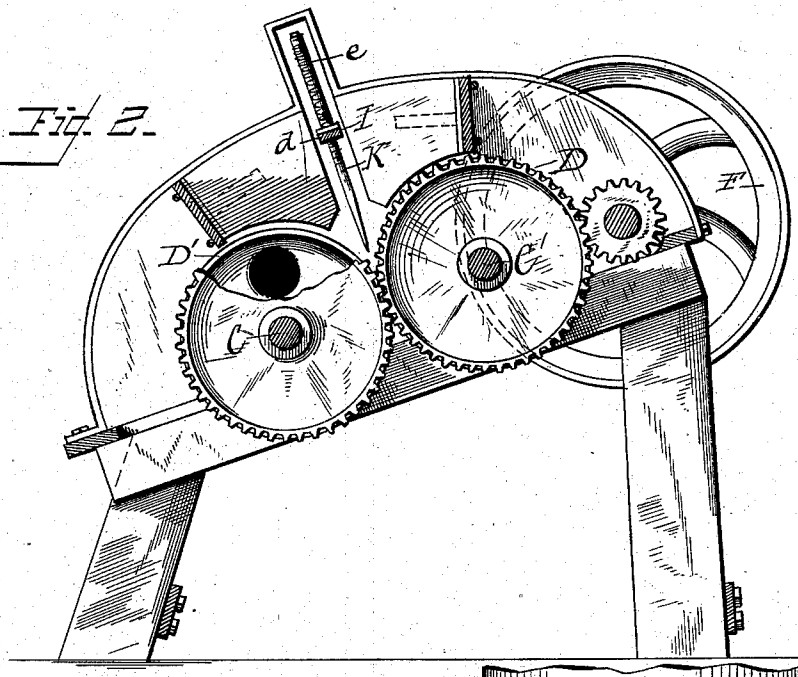
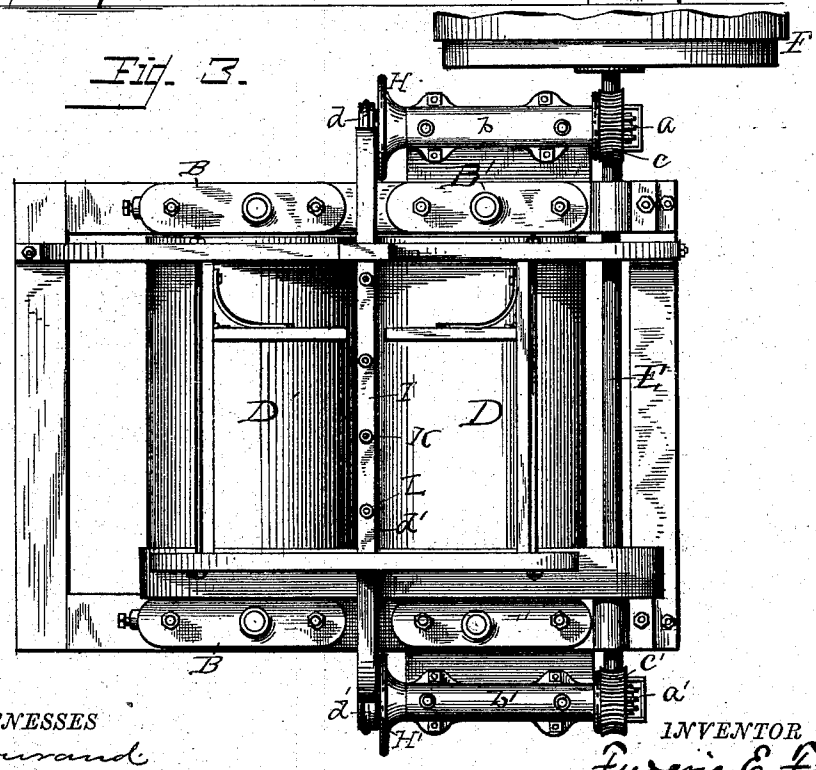


Fig. 3.



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CLAY CRUSHING MACHINE.

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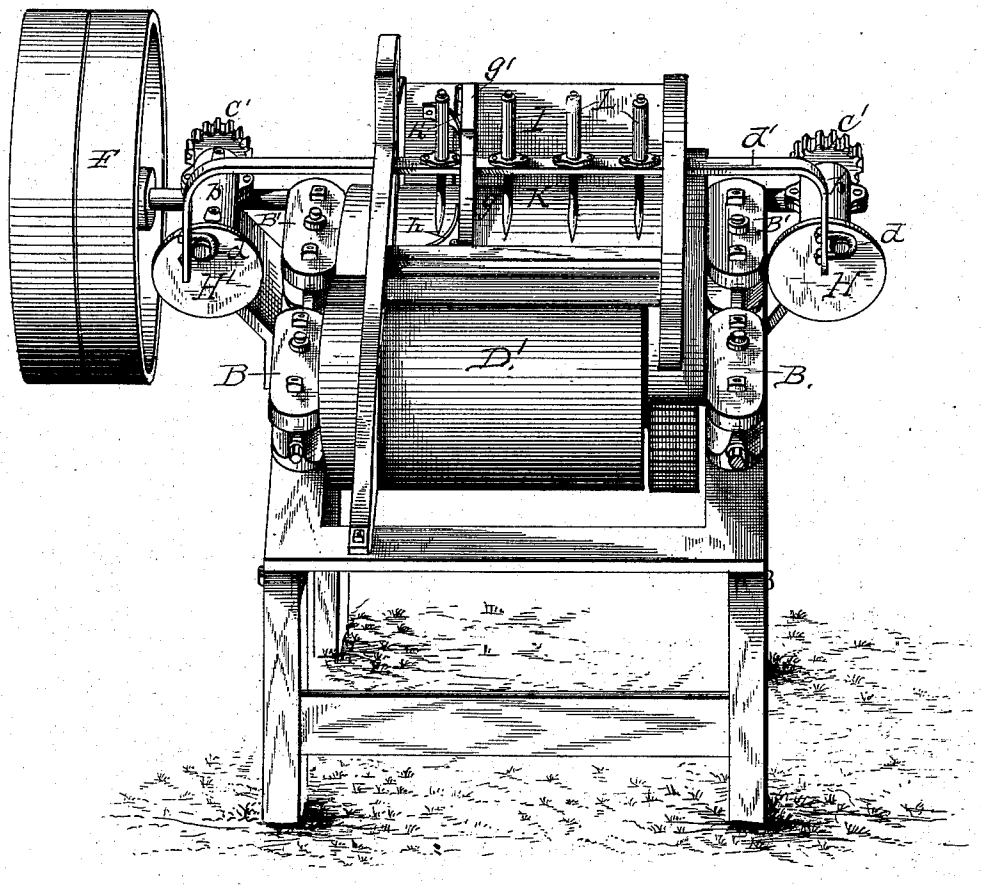
Fig. 4.



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UNITED STATES PATENT OFFICE.

FREDERIC E. FREY, OF BUCYRUS, OHIO.

CLAY-CRUSHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 295,533, dated March 25, 1884.

Application filed February 11, 1884. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC E. FREY, a citizen of the United States of America, residing at Bucyrus, in the county of Crawford, in the State of Ohio, have invented a new and useful Machine for Crushing Clay, of which the following is a specification.

My invention relates to improvements in clay-crushing machines, the object being to provide a machine of the kind named having attachments for breaking up large lumps of clay which may be present in the hopper, and by the same means to remove or discharge from the hopper stones and other infrangible objects which may be among the clay.

My invention therefore consists in the novel construction and combination of the parts, as will be more fully hereinafter described, and specifically pointed out in the claims.

I attain the purposes and objects of my invention by means of the mechanism illustrated in the annexed drawings, wherein—

Figure 1 is a perspective view of a clay-crushing machine with my improvements applied thereto. Fig. 2 is an end view, showing the rake or clod-breaker. Fig. 3 is a longitudinal sectional view, and Fig. 4 is a plan view of the machine.

The letter A represents the frame on which the machine is set and rests, and to which it is secured. This frame may be of any desirable construction suited to reliably and permanently sustain the operative mechanism. I have shown it in the drawings as consisting of a substantial bed set on four strong legs or posts braced to meet all possible strain occurring during the operation of the machine. To this frame are secured journal-boxes B B′, in which rest the journals C C′ of the crushing or grinding rollers D D′. One set of the journal-boxes, B, is made adjustable, in order that the rollers may be adjusted and set to grind or crush the clay to any degree of fineness desired.

The letter E represents a shaft suitably journaled in boxes fixed to the frame, substantially as shown in Fig. 1 of the drawings, and fixed to one end of this shaft E is a driving-pulley, F, and it is also provided or formed with the screws *a a′*, for the purpose hereinafter named.

The letters G and G′ represent shafts arranged at right angles to the shaft E, and securely boxed in the journal-boxes *b* and *b′*, fixed to the frame outside of the hopper, as shown in the drawings. On one end of each of these shafts G and G′ are fixed the gear-wheels C and *c′*, which engage with the screws *a* and *a′* on the shaft E, and on the other end of each of the shafts G and G′ are fixed the crank-heads H and H′, provided with a wrist or lug, *d*, to which the depending arms of the rake-head bar are pivotally secured.

The letter I represents the rake, which consists of a single bar, *d′*, having the ends bent down, and provided with means by which it is attached to the wrist or lug on the crank-heads of the shafts G and G′. The horizontal portion of this rake-head bar, which extends over the rollers and through the hopper, is provided with a series of perforations, through which are projected the rake teeth or fingers K. That these teeth may be automatically adjustable in a vertical direction, I secure to the bar *d′* the tubes L, having their upper ends perforated, to admit of the passage of the upper part or shank of the tooth or finger, and in the tubes I adjust a coil-spring, *e*, the upper end of which finds a seat on the upper end of the tube, and the lower end sets on a collar of the tooth, substantially as seen in Fig. 2 of the drawings. This construction provides a retractile function to each tooth, and admits of the motion of the rake-head without hinderance when the point of the tooth or any number of them or all of them strike an obstruction in the hopper. At the same time the crushing or cleansing effect is not lessened. The motion imparted to the rake is of course identical with the movement of the cranks. The steel fingers on the rake-head, it will be seen, are loose, and will push back into the sockets or tubes fixed to the head whenever an obstruction is struck which cannot be removed readily, or which cannot be broken by the fingers. The fingers or teeth are arranged relatively to correspond with the stroke of the crank, so that by each movement objects are successively reached by succeeding teeth and propelled forward, to be encountered by the next tooth. As the fingers are raised by the rake-head, the hard lumps of clay fall under them and are crushed or pounded to pieces,

and the stones separated from them and discharged over the end of the rollers.

The letter M represents the hopper, made to fit the frame and set over and about the crushing-rollers, the side pieces, 1 2, having formed in them the mortises or ways 3 4, to afford room for the movements of the rake, and across the hopper, transversely to the length of the rollers, are the hinged sections or partitions *g g'*, which are arranged on both sides of the rake-head, so that their free ends will not interfere with the movements of that part of the machine. These hinged sections or partitions are hinged so that they can open only in the direction it is intended to discharge what may pass between them, and when pushed from a straight position, as a means for restoring them to, as well as for holding them in, a straight position, I fix in the hopper the springs *h h'*. One end of these springs is fixed to the sides of the hopper, and the free end sets against the section. It will thus be seen that when the rake encounters a stone or other infrangible object it will be forced in a direction of the partitions and through the opening betweem them, and if too large to go through the space between them, it will be pushed by the teeth against the sections with sufficient force to cause them to give way and let it pass through, to be discharged over the end of the rollers. Should the large lumps of clay be forced against the partitions, the stability of the latter is such that the clay will be crushed against them and be reduced, and if any clay is forced through the space between the partitions with the stones, it still has time to be ground by that part of the rollers on the other side.

What I claim, and desire to secure by Letters Patent, is—

1. In combination with a clay-crushing machine, the rake or crusher arranged over and parallel with the rollers, and means for imparting a reciprocating motion to said rake, substantially as and for the purpose set forth.

2. In combination with a clay-crushing machine, the rake or crusher, consisting of a bar arranged over and parallel with the rollers, and provided with a plurality of fingers made vertically adjustable, and means for imparting a reciprocating motion to said rake, substantially as and for the purpose set forth.

3. In combination with a hopper of a clay-crushing machine, provided with retaining-springs, the sectional partitions hinged to the ends of the hopper and adapted to be held or restored to position by the retaining-springs, substantially as described.

4. In combination, the shaft E, provided with screws *a a'*, the shafts G G', with gear-wheels *b b'* and crank-heads H, and the rake I, having tubes L and a series of vertically-adjustable fingers K, projected through the bar and into said tubes, substantially as and for the purpose stated.

5. In combination with a clay-crushing machine, a rake or crusher arranged parallel with the rollers, means for imparting a reciprocating motion to said rake, and a hopper having sectional partitions hinged to the ends of the hopper, and held or restored to position by retaining-springs, substantially as described, and for the purpose set forth.

6. In combination with a clay-crusher, the rake arranged parallel with the rollers and provided with tubes L and fingers or teeth K, projected through the bar and into the tubes, and adapted to automatical adjustment, substantially as described, and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two attesting witnesses.

FREDERIC E. FREY.

Attest:
J. T. HOOVER,
C. F. HOOVER.