J. C. Mc Kenzie,

Pug Mill,

No 82,626. Patented Sept. 29, 1868.

Fig: 2.

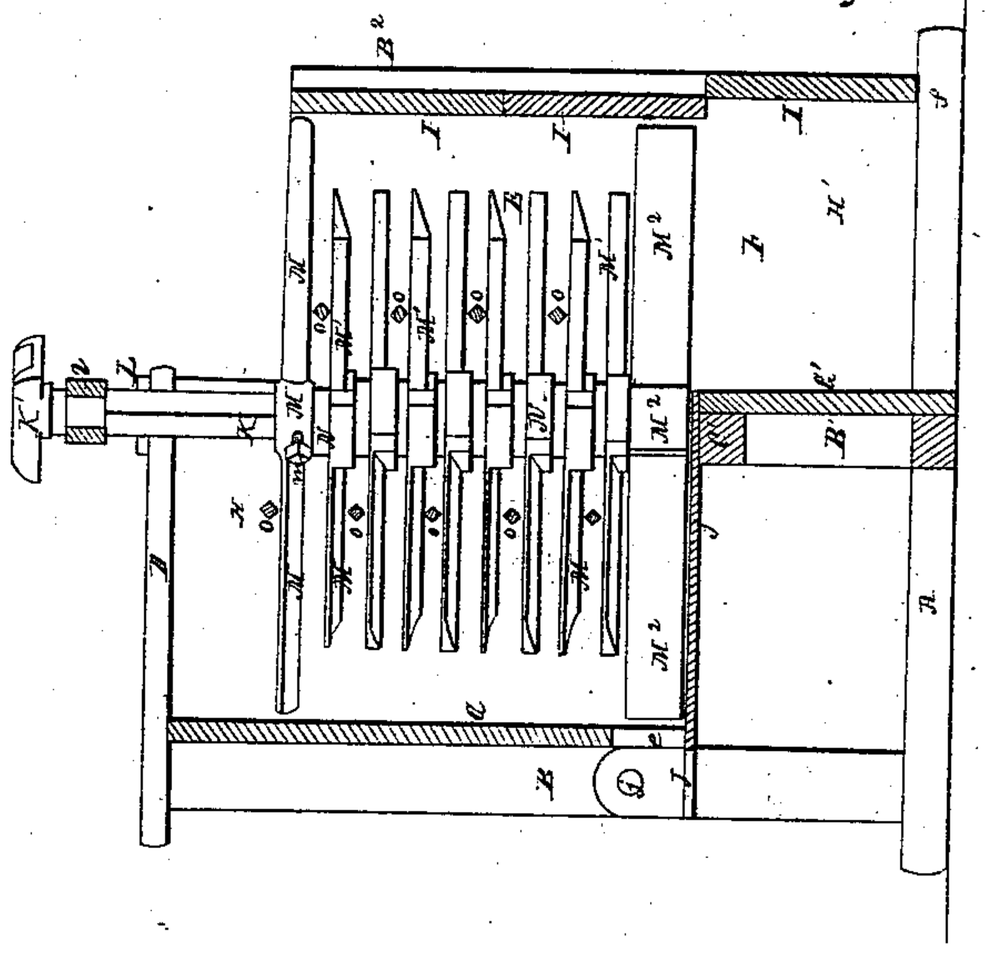


Fig: 1.

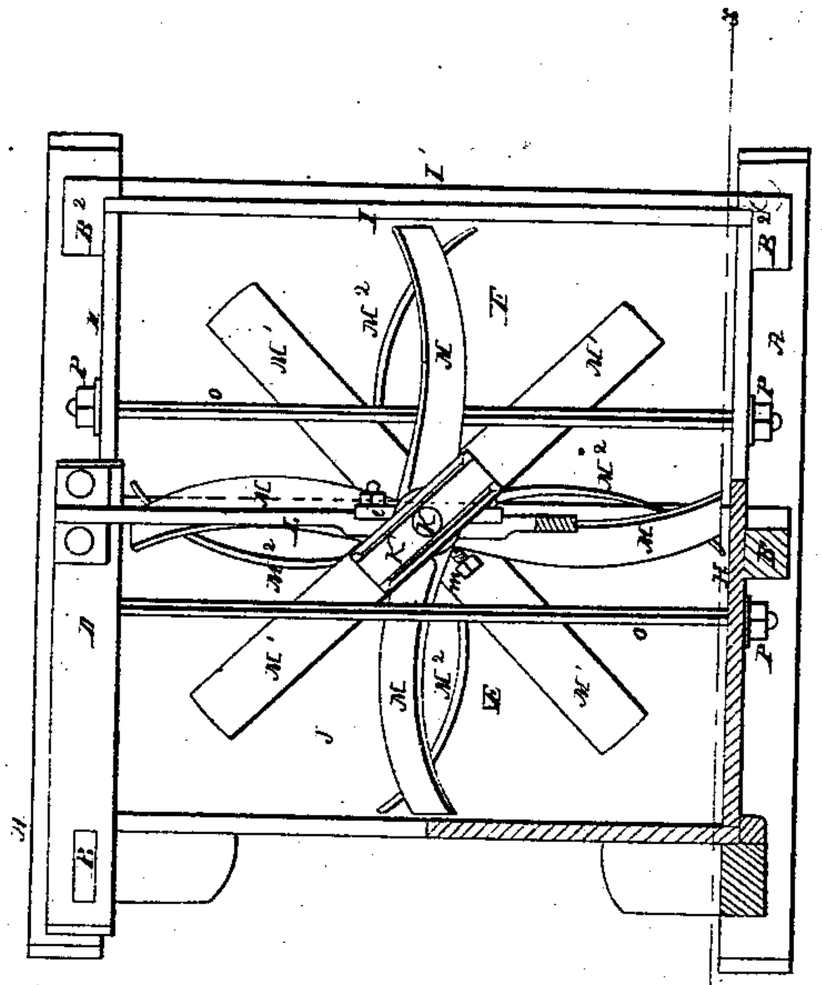
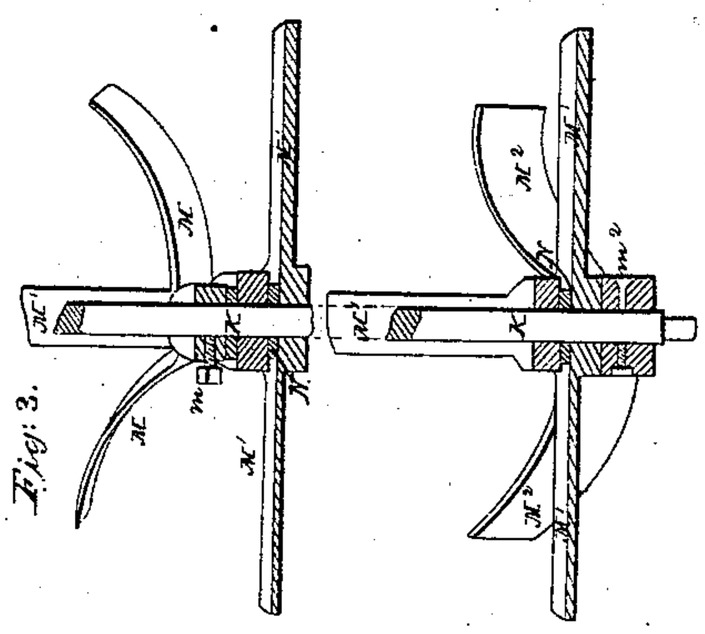


Fig: 3.



Witnesses:

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J. C. McKENZIE, OF ADRIAN, MICHIGAN.

Letters Patent No. 82,626, *dated September* 29, 1868.

IMPROVED PUG-MILL.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, J. C. McKENZIE, of Adrian, in the county of Lenawee, and State of Michigan, have invented a new and useful Improvement in Pug-Mills; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improvement in "pug-mills," or machines for grinding and tempering clay for making bricks; the object of the improvement being to produce a mill of superior simplicity, strength, and durability, as well as effectiveness in performing its functions.

In the drawings—

Figure 1 represents a plan view of my improved pug-mill, certain parts being broken away to more fully illustrate its construction.

Figure 2 is a longitudinal section on the line *x x*, fig. 1.

Figure 3 is a sectional perspective view of portions of the pug-shaft detached, illustrating the form and arrangement of the different knives, &c., and the manner of securing them on the shaft.

A A may represent a pair of sills, B B B^1 B^1 B^2 B^2 uprights or posts, and C C′ transverse, and D D longitudinal battens or beams, all of which parts may be of any suitable wood or other material, of the relative size and arrangement shown in figs. 1 and 2, and compose the framework of the mill. The form of the mill or tub thus constructed is such (see fig. 2) as to form internally two chambers, E F, the functions of which will be described hereafter.

The walls, G H H, of the chamber E, and those, G′ H′ H′ I′, of the chamber F, may be composed of boards, suitably joined and secured to the framing.

I I are removable doors, constituting the rear wall of the chamber E.

J is a plate, of iron or other suitable material, attached at its front end, by means of bolts *j*, to the posts B B, fig. 2, and resting at its rear end on the cross-piece C′, thus constituting one-half of the bottom of the chamber E.

The chamber F is filled, to about a level with said plate, with soft clay, or other similar substance, which forms the other part of the bottom of the chamber E, and which absorbs the water used in "soaking the clay," and also forms a reservoir for stones and other obstructions usually deposited upon the bed-plate.

e represents an opening for the discharge of the tempered clay, and *f* an aperture for the discharge of water from the chamber F.

K is a vertical shaft, stepped in a suitable bearing formed in the bed-plate J, and journalled at its upper end in a bearing, *l*, in the centre of a bar or bracket, L, provided for that purpose, and which is attached to the cap-pieces, D, of the frame, over the posts, B^1, as shown in fig. 1. The shaft, K, is provided on its upper end with a head, K′, for the reception of a beam by which to rotate it, or with some other appliance for that purpose. Between its bearings it is of a square or other angular form, to adapt it for the reception of the knives, &c., the form and arrangement of which are clearly shown in the several figures.

M M represent the compressing or feeding-wings, which receive the clay and force it down to the grinding-knives.

M^1 M^1 represent the grinding-knives, and M^2 the discharging-wings, which force the tempered clay out at the discharge-aperture *e*. The wings, M^2, (preferably four in number,) all revolve in the same plane, and are cast or otherwise formed in one piece, with a central hub suitably pierced for the reception of the shaft, on which they are secured at a suitable height by the bolt or rivet m^2, fig. 3. They may be perfectly straight, vertically, and are so curved as to throw the clay from the centre toward the sides of the tub for the purpose of discharging it at the aperture *e*, as before explained. The knives M^1, the number of which is varied according to the height of the tub, are cast or otherwise formed in gangs (preferably) of two, having a central perforated hub for the reception of the shaft, on which they are arranged, as represented in fig. 3, so as to project alternately at right angles, as shown most clearly in fig. 1. The pairs of knives each revolve in the same plane,

and are preferably perfectly straight longitudinally, as shown, their front edge being bevelled, so as to force the clay, displaced by them, downward.

The wings M, of the same number as the ones M^2, (four,) like them revolve in the same plane, and are cast or otherwise formed in one piece, with a central perforated hub for the reception of the shaft, on which they occupy the upper position, and are secured by means of a set-screw, *m*, so as to allow of their adjustment on the shaft to admit a greater number, or some other adjustment of the knives M^1. These wings are curved in an opposite direction to the ones M^2, as represented in fig. 1, so as to have a tendency to draw the clay toward the centre, where the grinding-knives have the greatest power, and are inclined so as to force the clay down to said knives, as before described.

N N are washers, interposed between the knives M^1, and between them and the upper and lower wings, when necessary, to regulate their position, the number of said washers being multiplied or diminished, as may be required.

O O are angular metallic rods, extending transversely through the chamber E in two vertical series, as shown, or otherwise, and secured by the application of nuts, P, to their threaded ends, as represented in fig. 1. They are arranged with their corners opposed to the direction of the knives, and so distributed as to allow of the knives, M^1, and wings, M, passing between them, as shown in fig. 2; their use being to arrest the clay, and prevent it revolving in the tub under the action of the knives and wings, and at the same time, by their form, to assist in breaking up the lumps, and forcing the clay into a position to be acted on by the knives. They also serve to brace the sides of the tub, and for that purpose they may, if desired, be alternately inserted longitudinally of the tub, or all of them may be inserted in that plane if preferred.

Any roots or similar obstructions becoming engaged in the bars O, or the knives, may be readily removed by withdrawing one or both of the doors, I, which also afford a ready means for emptying and supplying the chamber F.

My invention is especially adapted for use in connection with a portable "moulding-machine," the necessary strength of structure being secured with the least possible weight.

Having thus described my invention, I claim as new therein, and desire to secure by Letters Patent—

1. The chamber or reservoir F, arranged and employed in connection with the chamber E, substantially as described, for the purpose specified.

2. The pug-mill, constructed as described, with the chambers E F, doors I, and aperture *e*, the horizontal angular rods O, pug-shaft K, and blades M M^1 M^2, all arranged to operate, substantially in the manner set forth.

To the above specification of my pug-mill, I have signed my hand, this 6th day of July, 1868.

J. C. McKENZIE.

Witnesses:

MORTON EDDY,

E. D. EDDY.