C. D. WRIGHTINGTON.

Brick and Tile Machine.

No. 163,432. Patented May 18, 1875.

Fig 1.

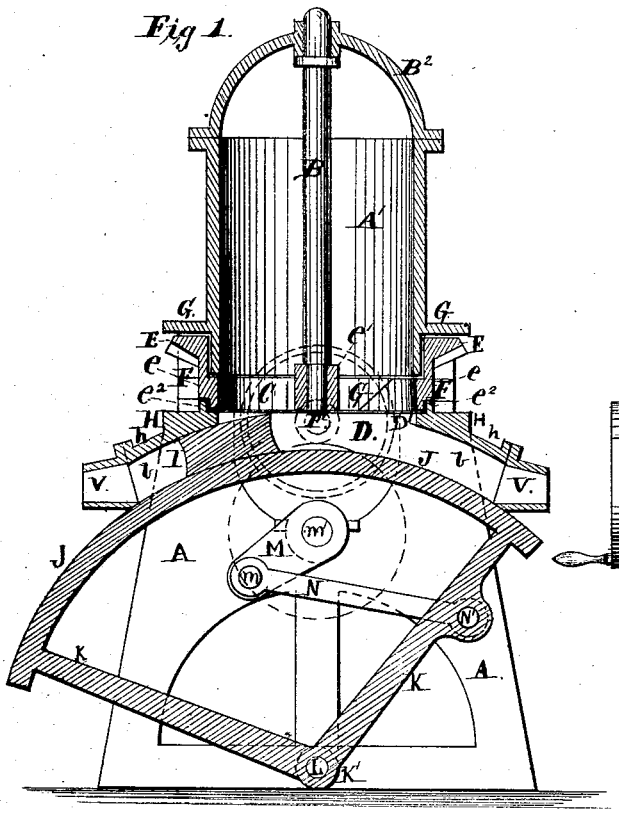


Fig 2.

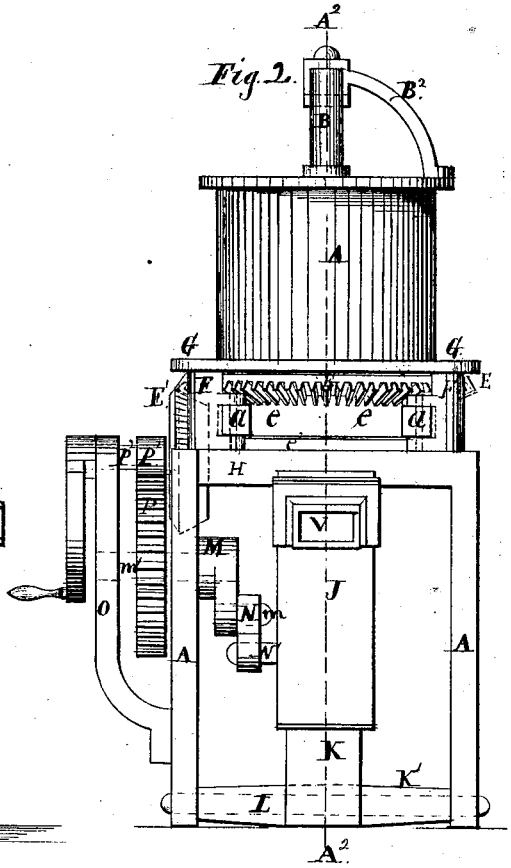


Fig 3.

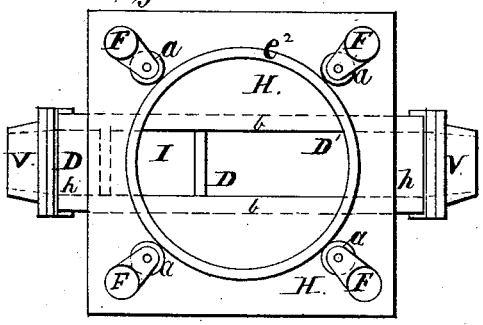
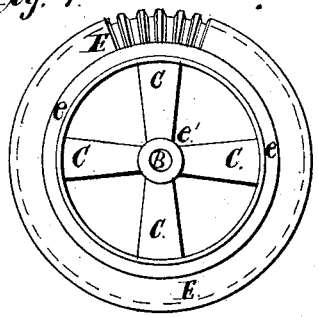


Fig 4.



Witnesses:
Nelson Collins
Nathan B Ellis

Inventor:
Charles D. Wrightington

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

CHARLES D. WRIGHTINGTON, OF FAIRHAVEN, MASSACHUSETTS.

IMPROVEMENT IN BRICK AND TILE MACHINES.

Specification forming part of Letters Patent No. **163,432**, dated May 18, 1875; application filed April 15, 1874.

To all whom it may concern:

Be it known that I, CHARLES D. WRIGHTINGTON, of Fairhaven, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Brick and Tile Making Machines, of which the following is a specification:

In the accompanying drawings the same letters refer to like parts in all the figures.

Figure 1 is a sectional side elevation of the machine, showing those parts to the left of the line A^2 A^2, Fig. 2. Fig. 2 is a front or end elevation of the machine. Fig. 3 is a plan of the bottom plate of the pug-mill; also showing the posts which support the pug-mill; also showing the opening into the mud-box, and the ends and mouth-pieces of the same; also the friction-rollers which hold the gear in place, which rotates the pug-mill shaft. Fig. 4 is a plan of the gear which rotates the pug-mill shaft; also the annular ring which forms a part of the pug-mill, and to which the inclined forcing-blades are secured.

A A are the side frames, which are made strong and heavy enough to resist the strains of the moving parts of the machine. H H is the bottom plate of the pug-mill, and also connects the upper ends of the frames A A. It also forms the top *h h* and sides *b b* of the mud-box. A′ is the pug-mill or hopper, in which the clay is tempered. B is the pug-mill shaft, on which are placed knives for tempering the clay. It is not deemed needful to show these knives in the drawing, as they are a common device. B^2 is the yoke which forms a bearing for the upper end of the pug-mill shaft B. G G is a flange extending around the lower part of the pug-mill, by which the pug-mill is secured to the bottom plate H H, or to the frame-work of the machine. F F, Figs. 1 and 2, and F F F F, Fig. 3, are the posts which rise from the bottom plate H H, and to which the pug-mill A′ is secured by means of the flange G G. E E is a bevel-gear, which rotates the pug-mill shaft B, and forms the lower part of the pug-mill A′. C, Fig. 1, and C C C C, Fig. 4, are inclined blades or arms, which act as a screw or a propeller to force the clay into the mud-box or other receptacles for the clay. The inclined blades C C C C serve the purpose of arms or spokes for the bevel-gear E E. E′, Fig. 2, is a bevel-pinion, which rotates the gear E E. D is the mud-box, the top and sides of which are formed by the bottom plate H H. I is an abutment, which acts as a piston for forcing the clay from the mud-box D. V V are the mouth-pieces of the mud-box. J J is an oscillating segment, which forms the fourth and lower side or bottom of the mud-box D. To the center of the segment J J, the abutment or piston I is secured. K K are radial arms, which secure the segment J J to the hub K′. L is the fulcrum on which the segment oscillates. P^2 is the driving-shaft to which the bevel-pinion E′ is secured. P^1 is a pinion, which rotates the wheel P and shaft *m′*; this in turn rotates the crank M. N is a connecting-rod, secured to the wrist-pin *m* in the crank M and to the wrist-pin N′ in the arm K of the segment J J.

I have divided my invention into two principal parts. The first part relates to the combination of the pug mill or hopper of a brick or tile machine, with the mechanism which rotates the pug-mill shaft, and the inclined blades or arms which force the clay into the mud-box or into the molds of a brick or tile machine.

The following is a detailed description of the first part of my invention: A′ is the pug-mill, which may be of the usual form, the top being attached to the flange G G, below which it must be circular. B is the pug-mill shaft, on which are placed the usual knives for tempering the clay before it is forced into the mud-box or other receptacle. To the lower part of this shaft are secured the inclined blades C C C C. These inclined blades may be of the usual form, with the exception of having the driving-gear attached directly to their outer ends. E is the bevel-gear, which rotates the inclined blades C C C C and the pug-mill shaft B, and which is attached to the outer ends of the inclined blades aforesaid, and it also forms a continuation of the lower part of the pug-mill.

I do not wish to limit my invention to the use of a bevel-gear, as a spur-gear may be used with equal facility when the form of the machine admits of it. The said gear receives its motion from the bevel-pinion E′, Fig. 2.

The pug-mill A′ is supported by means of the flange G G, which rests upon the posts F

F, Figs. 1 and 2, and F F F F, Fig. 3, which rise from the bottom plate H H of the pug-mill A′, or the frame-work of the machine. The posts are placed far enough apart to admit of the bevel-gear being placed within them.

The sides of the pug-mill A′ are extended a sufficient distance below the flange G G to admit the bevel-gear E E, or the interior of said gear, to encompass the said extension of the pug-mill, for the purpose of preventing the leakage of clay. The bevel-gear E E is connected to and forms a part of the annular ring *e e*. This annular ring is extended below the teeth of the gear E E, in order to provide a surface for friction-rollers to roll on. From the inner surface of the annular ring *e e* the inclined blades C C C C extend to the center hub *e′*, into which the pug-mill shaft B is secured. The annular ring *e e* forms a continuation of the pug-mill A′, and extends up and around the lower part of the pug-mill A′ for the purpose of covering or breaking the joint at the under edge of the pug-mill. The internal diameter of the annular ring *e e* is somewhat greater than the diameter of the pug-mill, in order that the clay may pass freely over the said ring. The annular ring *e e* also extends down into the bottom plate H H or into a lip thereon, a sufficient distance to prevent the leakage of clay. The bevel-gear E E is held in position laterally by means of four friction-rollers, *a a a a*, (Figs. 2 and 3,) which are attached to the inner sides of the posts F F F F, and which touch the outer surface of the annular ring *e e* and allow it to rotate freely. The lower end of the pug-mill shaft B requires no other bearing.

The objects of this part of my invention are as follows: First, to enable me to apply the power directly to the inclined blades or propellers, which perform the burden of the work of forcing the clay into the mud-box or molds, as the case may be. Second, it also admits of the pug-mill shaft being rotated from its lower end, without being compelled to extend the said shaft below the mud-box D. Third, it admits of the mud-box D being placed directly under the center of the pug-mill A′, which gives the largest possible opening from the pug-mill into the mud-box D. Fourth, the inclined blades C C C C are very much strengthened by the annular ring *e e*, which unites them firmly together, which is of great importance.

The second part of my invention relates to the combination of a mud-box with an oscillating or reciprocating segment or side, which extends the entire length of the mud-box, and the extent of its own movement in addition, and which forms one or more sides of the mud-box, (in this case the bottom side,) and with an abutment or projection on the surface of the segment or side, which operates as a piston or plunger for forcing the clay from the mud-box.

In Fig. 1, D is a circular mud-box, which requires an oscillating segment, J J, with arms K K extending to hub K′, or fulcrum L. In place of a circular mud-box a straight box may be used, and one or more of the sides may be made to reciprocate. I is the abutment or piston which travels to and fro the length of the mud-box. M is a rotating crank, which causes the segment J J to oscillate, and where a straight mud-box is used it will be reciprocated by the said crank. The connection between the crank M and the segment J J, is formed by the wrist-pin *m* in the said crank, the connecting-rod N, and the wrist-pin N′ in the arm K of the segment J J. *m′* is the crank-shaft, which is rotated by the cog-wheel P, which in turn is rotated by the pinion P^1 on the driving-shaft P^2. O is a bracket which supports the outer ends of the shafts *m′* and P^2.

The objects of this part of my invention are as follows: First, I am enabled to make a double-acting machine, by using the oscillating segment J J, with the abutment or piston I at the center of the arc of the said segment, and by having an outlet or mouth-piece V V at each end of the mud-box D. The machine thus produces double the amount of bricks produced by single-acting machines, and with about the same amount of machinery as in a single-acting machine. Second, by making the segment J J the bottom of the mud-box, the friction thereon is almost entirely done away with, inasmuch as the segment moves at the same rate of speed as the clay in the mud-box, thus requiring much less power to force the clay through the mouth-pieces V V than would be the case were the clay compelled to slide over a fixed bottom to the mud-box. Third, by constructing the machine as described, the heavy-moving parts of the machine are placed near the base of the machine and in close connection with each other, thus insuring great strength and stability with the least amount of material most favorably disposed.

I do not wish to limit my invention to the precise arrangement shown in the drawings. I have represented this arrangement as I consider it the most convenient, and economical in the use of material and space.

The segment J J may be placed in a horizontal position, and the mud-box be made to conform to it, without materially changing the machine or impairing its effectiveness; and, in some cases, it may be desirable to do so. In that case the bottom side, as well as the segment, could be made to oscillate.

Having now described the nature and objects of my invention, I will describe the operation of the machine as follows, viz: Power being applied to the driving-shaft P^2 causes the bevel-pinion E′ to rotate, which, in turn, rotates the bevel-gear E E, the annular ring *e e*, the inclined blades C C C C, and the pug-mill shaft B. The pinion P^1 on the driving-shaft P^2 rotates the cog-wheel P, the shaft *m′*, and crank M. By means of the connecting-rod N the segment J J and the piston I are

caused to oscillate the required distance. The clay is then thrown into the pug-mill A′, and is mixed and tempered in the usual manner. The clay is then pressed into the mud-box D by the inclined blades C C C C. The clay is then alternately forced out at each end of the mud-box D and mouth-pieces V V by the oscillating segment J J and piston I. The mouth-pieces V V form the clay into a strip or ribbon suitable to be cut up into bricks.

I claim as my invention—

1. In a brick or tile machine, the pug-mill A′, the lower part of said pug-mill or hopper being formed by the rim of the driving-gear E, or by an extension of said rim, or by an annular ring, connected to the said gear E, substantially and for the purpose set forth.

2. In a brick or tile machine, the mud-box or compressing-chamber, having the piston or plunger I secured to the rocking or oscillating segment J J, the latter forming the bottom of said mud-box, and the two having a movement in unison, for the purpose set forth.

3. The combination of the pug-mill or hopper A′, having the flange G G, with the posts F F F F, and the bottom plate H H, for the purpose set forth.

4. The combination of the pug-mill A′, having a flange, G G, with the bevel-gear E, the pinion E′, the annular ring *e e*, the inclined radial blades C C C C, and the shaft B, for the purpose set forth.

5. The combination of the bevel-gear E, the rim thereof forming the lower portion of the pug-mill A′, and the pinion E′, with the inclined radial blades or propellers C C C C, for the purpose set forth.

6. The combination of the bevel-gear E, having the annular ring *e e*, with the friction-rollers *a a a a*, for the purpose set forth.

7. The combination of the bevel-gear E, the pinion E′, the annular ring *e e*, and the radial inclined blades C C C C, with the bottom plate H H, as described, and for the purpose set forth.

8. The combination of the gear E, the annular ring *e e*, and the radial inclined blades C C C C, with the mud-box D or other receptacle for the clay, as described, and for the purpose set forth.

9. The combination of the pug-mill A′ with a segmental mud-box, D, as described, and for purpose set forth.

10. The combination of the mud-box D and the mouth-pieces V V with the piston I and the oscillating segment J J, as described, and for the purpose set forth.

11. The combination of the oscillating segment J J, the radial arms K K, and the hub K′, with the side frames A A and the bottom plate H H, as described, and for the purpose set forth.

12. The plunger I, oscillating upon the arc of a circle from end to end of a mud-box, and under the main shaft B, as and for the purpose described.

CHARLES D. WRIGHTINGTON.

Witnesses:

NELSON COLLINS,

NATHAN B. ELLIS.