

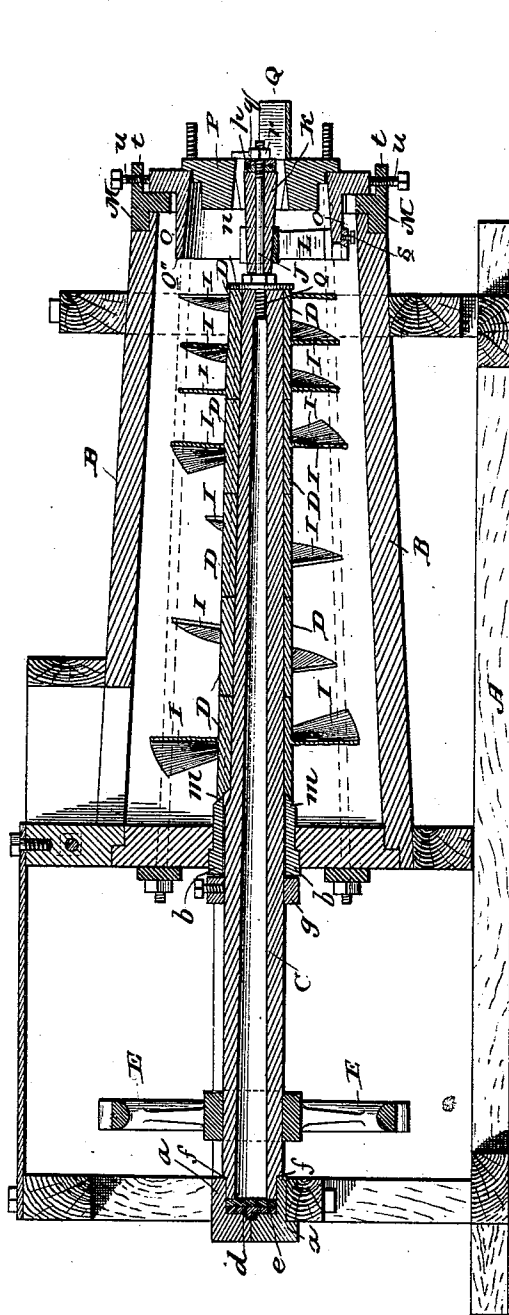
J. C. McKENZIE.

Brick and Tile Machine.

No. 233,535.

Patented Oct. 19, 1880.

Fig. 1.



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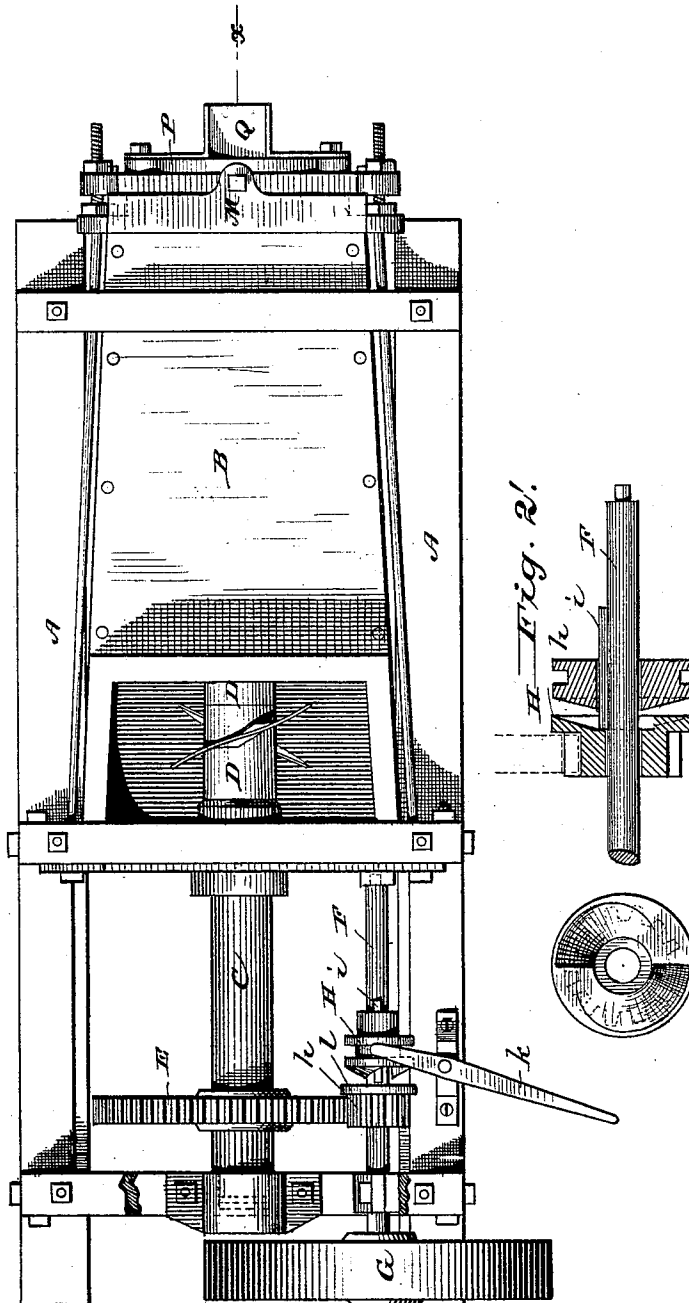
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Fig. 2.



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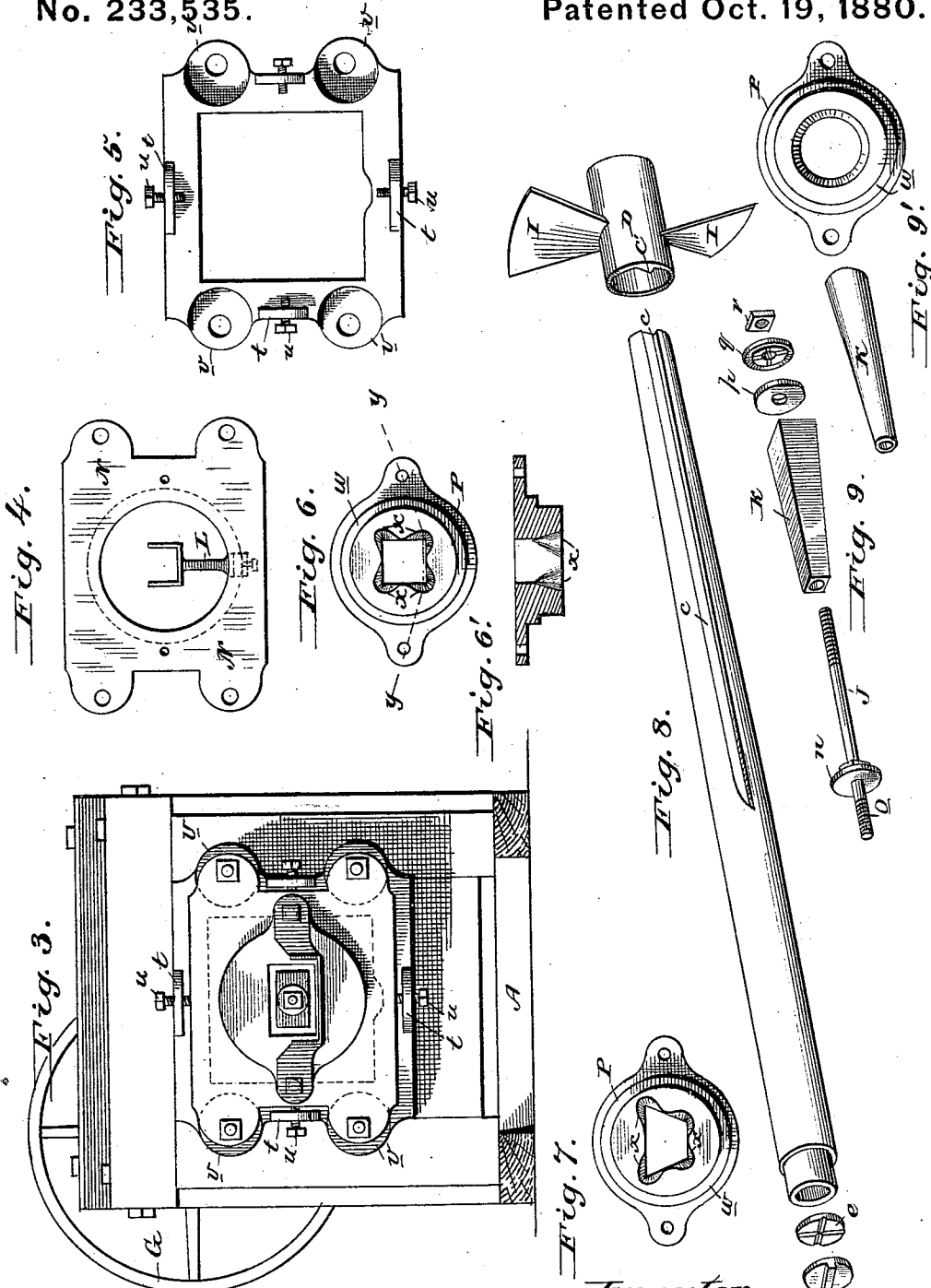
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Fig. 12.

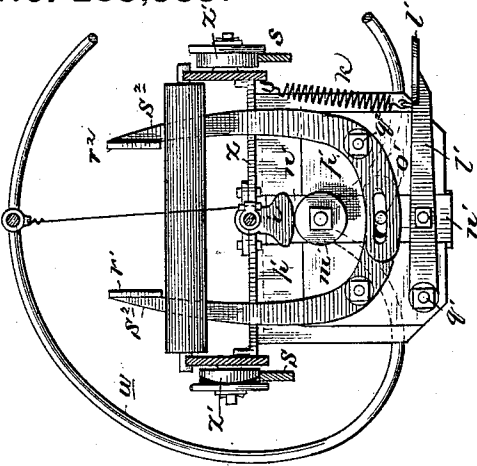


Fig. 10

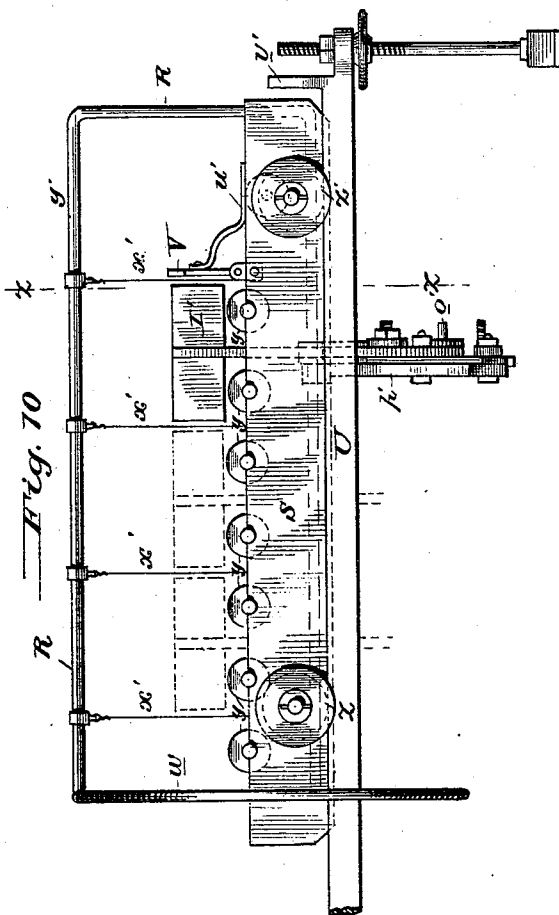
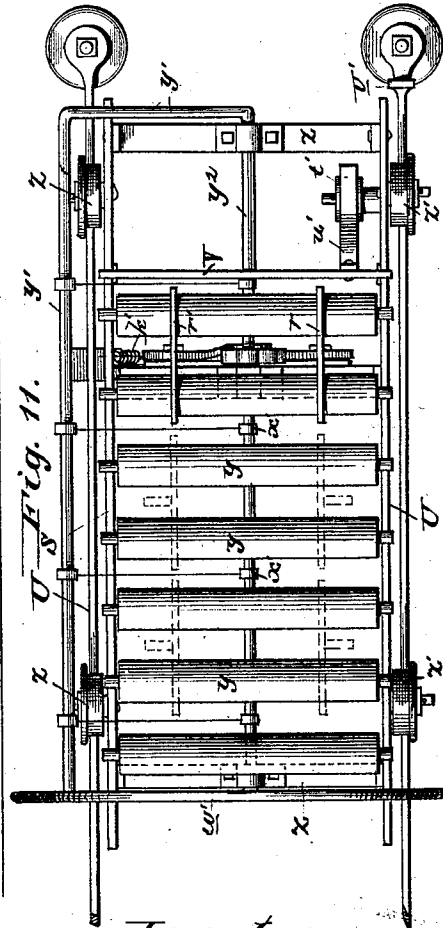


Fig. 11.



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UNITED STATES PATENT OFFICE.

JOSEPH C. MCKENZIE, OF ADRIAN, MICHIGAN.

BRICK AND TILE MACHINE.

SPECIFICATION forming part of Letters Patent No. 233,535, dated October 19, 1880.

Application filed January 17, 1880.

To all whom it may concern:

Be it known that I, JOSEPH C. MCKENZIE, of Adrian, in the county of Lenawee and State of Michigan, have invented certain new and useful Improvements in Brick and Tile Machines, of which the following is a specification.

My invention relates to improvements in that class of brick and tile machines in which a slab of clay exudes from the pug-mill or tempering-chamber and is cut into suitable lengths, forming bricks or tiles; and it consists in the construction and operation of parts hereinafter described.

In the accompanying drawings, forming a part of this specification, similar letters of reference refer to similar parts throughout the several views.

Figure 1 is a longitudinal vertical section taken upon the line *x x* of Fig. 2. Fig. 2 is a plan view with a part of the frame removed. Fig. 2' is a view, partly in section, showing the clutch. Fig. 3 is a front elevation. Fig. 4 is a plan view of the die-plate. Fig. 5 is a plan view of the end of the tempering-chamber with the die-plate removed. Fig. 6 is a plan view of the inner side of a die. Fig. 6' is a sectional view upon the line *y y* of Fig. 6. Fig. 7 is a view of the inner side of a modified form of die. Fig. 8 is a view of the hollow shaft, showing the friction-washers and sleeve ready to be stepped in place. Fig. 9 is a view of the core-pin, a square and a revolving core, friction-washers, and nut. Fig. 9' shows details of the core and core-pin. Fig. 10 is a side elevation of the cutting-table. Fig. 11 is a plan view of cutting-table, and Fig. 12 is a section upon the line *z z* of Fig. 10.

A denotes the frame, constructed and arranged in any suitable manner, which supports a pug-mill or tempering-chamber, B. The latter is made preferably of iron and tapering on all its sides toward the front end.

A horizontal tempering-shaft, C, seated in bearings *a* in the frame and *b* in the rear end of the tempering-chamber, extends forward through the center of the tempering-chamber to near the front end of said tempering-chamber. The bearings *a* should be placed far enough back of the bearing *b* to have the shaft, when carrying its cog-wheel, balance on the bearing *b*, thus precluding the necessity for any support for the front end of the shaft.

The shaft C is made preferably of steel, cast hollow for the purpose of getting the greatest diameter with a given weight of metal, thereby providing a large surface for the bearing at *a* and *b*, rendered necessary by the extension of the shaft into the tempering-chamber without a bearing for the front end.

The shaft C is cast tapering toward its front end for the purpose of dispensing, as far as possible, with weight of metal at its front end, and to facilitate the quick and easy movement of the sleeves D to and from their proper places. This shaft has a rabbet, *c*, extending from the bearing *b* to its front end, for the reception of a shoulder, *c'*, on the inside of the sleeve.

The bearing *a* receives the rear end of the shaft against two washers, *d e*, provided with lubricating-grooves to ease the friction resulting from the backward thrust of the shaft.

The rear end of the shaft is turned down to enter the bearing *a* and produce a shoulder, *f*, which bears against the front end of bearing *a*.

The shaft is provided with a collar, *g*, having a set-screw, which is placed against the rear end of the bearing *b*, for the purpose of resisting a forward movement of the shaft during the transportation of the machine from point to point. Near its rear end, just in front of the bearing *a*, the shaft carries a cog-wheel, E, attached thereto, which engages with a loose pinion, *h*, upon a small shaft, F. This shaft carries a band-wheel, G, which is attached to its end and communicates motion to the machine, and a clutch, H, which slides upon a feather, *i*, and engages the loose pinion *h*, being operated by a lever, *k* upon an adjoining part of the frame. The feather *i* extends to a point adjacent to the pinion, and, together with the flange *l*, which extends beyond the periphery of the pinion alongside of the cog-wheel, prevents the lateral motion of the loose pinion.

The sleeves D have a taper corresponding to the taper of a relative portion of the tempering-shaft, and each sleeve has its own position on the shaft, which is determined by its internal diameter, and when in that position it fits the shaft snugly, but will permit of an easy movement toward the front end when the core-pin has been removed. Each sleeve is provided with an internal shoulder, *c'*, that

fits the rabbet *c* of the shaft and extends the entire length of the sleeve. The sleeve adjoining the bearing *b* is provided with a beveled flange, *m*, which extends over the projecting part of the bearing and excludes the clay from said bearing.

The sleeves *D* are placed upon the tempering-shaft contiguously, and form a complete shield and covering for the shaft extending from the bearing *b* to the core-pin, and each sleeve carries two knives, *I*, which are situated opposite each other. The sleeves are successively slid to their places upon the shaft, and the last one held in its place by the core-pin *J*. The last sleeve placed upon the shaft has, in lieu of two knives, a double screw-blade extending from end to end of the sleeve, each making one complete circuit of the sleeve.

The core-pin *J* has a flange, *n*, and a screw, *o*, the latter fitting the thread in the end of the tempering-shaft, the flange *n* serving to retain the sleeves upon the shaft. Upon this core-pin is placed a hollow core, *K*, within which the core-pin revolves freely. The core *K* is readily removable, and is held on the pin by two lubricating-washers, *p q*, and nut *r*.

In using the machine a round core is used for tile and a square one is used for square hollow brick, and any other form of core desired may be placed upon the core-pin.

When other than a round core is used it must be held stationary while the core-pin revolves within the core. For this purpose an arm, *L*, is used, with its upper end formed to fit the particular form of core used and its lower end attached to the die-plate by a set-screw, *s*, so that it can be removed when round tile or solid brick are made.

The core, core-pin, nut, and washers are removed from the tempering-shaft when brick or other solid articles are made, and a flanged screw inserted to keep the thread free from clay.

The lubricating-washers *p q* each have a circular groove just within the periphery, extending entirely around the washer, and from this groove other grooves lead to the center, coming in contact with the core-pin. These grooves are filled with a suitable lubricant, and are placed upon the core-pin with the grooves inward.

M represents the front or mouth of the tempering-chamber *B*, which is provided with lugs *t* for the reception of adjusting-screws *u* and lugs *v* for the reception of the rods which hold the die-plate *N*. The die-plate *N* has a central opening, which is provided with a flange, *o*, which extends into the tempering-chamber a suitable distance and supports the removable arm *L*. Into the opening in the die-plate a die, *P*, is placed, and attached to the face of the plate by screws passing through its lugs, or by any other suitable means.

It is necessary that the die fit the plate neatly and that it be centered accurately. To render this easy and of quick accomplishment the die is provided with a circular centering-flange,

w, which fits the opening in face-plate, thus bringing the die to a proper center with regard to the core.

The opening molding-orifice in the center of the die should be of the form desired for the top sides and bottom of the article to be made. When this molding-orifice has corners or angles of any description the inner end of the molding-orifice is beveled or chamfered and rounded at the angles to a point about one-half of the distance toward the front end of the die, as shown at *x* in Figs. 6 and 7 of the drawings. The result obtained by this construction is a greater amount of clay-pressure to the corners, which produces a clean, sharp, well-defined, and well-formed angle, dispensing entirely with the ragged-edged broken-cornered bricks common when the die is used in brittle clay without the beveled corners.

Attached to the front side of the die by any suitable means is a support, *Q*, conforming to the shape of the lower half of the molding-orifice, for sustaining the slab of clay in its passage from the die to the cutting-table.

When the slab of clay has been expressed from the molding-orifice of the die it passes over the support *Q* and onto the roller *y* of the cutting-frame *R*, and passes on in a continuous slab to the cutting-wires, where it is cut into the desired lengths for brick or tile, as the case may be.

The cutting-frame *R* consists of two parallel bars, *S S*, braced across the ends and center by bars *z z z* and mounted upon four wheels, *z' z' z' z'*, which travel upon two parallel rails, *U*, sustained by any suitable frame, the frame shown consisting of two standards at each end, and braced near the bottom. Pivoted to the center of the bars *z z* is a frame composed of two rods, *y' y'*, between which the cutting-wires *x'* are extended. One end of this frame is provided with a circular lever, *w'*, which is attached to the upper and lower part of the frame and extends over and passes under the rails *U* and inside their supports, so that the cutting-table is limited in its movement in that direction. The movement of the frame in the opposite direction is limited by the stop *v'*.

The cutting-table, bearing the frame with the cutting-wires, travels easily and freely upon the rails *S S* within the limits provided, and has a clamping device for seizing the slab of clay and compelling it to push the cutting-table along with it while the cut is being made, so that the cut will be square across the slab of clay.

The clamping device is constructed of two arms, *s' s'*, curved inward at their lower ends, and provided at their upper ends with oblong plates *r' r'*, and pivoted at *q' q'* to a pendant, *p'*, hanging from the central bar, *z*, their lower ends being slotted and passed over a pin, *o'*, attached to a sliding bar, *n'*, set into the pendant *p'*, and bearing a friction-roller, *m'*.

The lower end of the sliding bar is bolted to a foot-lever, *l'*, which is attached to the pend-

ant p' at its short end, and has its long end connected to the cutting-frame by a spring, k' . The function of the spring is to hold up the lever and thus throw the clamping-plates r' , r'^2 apart.

The rod y' has a pendent cam, i' , which engages with the friction-roller m' in such a manner that upon the movement of the cutting-frame from its position, as shown in Fig. 11 of drawings, the sliding bar n' will be depressed and in turn depress the lower ends of the arms s' , s'^2 and bring their upper ends, bearing the plates r' , r'^2 , against the slab of clay—a moment before the cutting-wires reach it.

A gate, V, extends across the cutting-table a suitable distance in front of the last cutting-wire, and is hinged at each end to the bars S S. To the back of this gate an arm, u , is attached, which extends downward, with a curve outward, to a point below the bottom of the gate, where it takes a horizontal outward direction for a suitable distance, and when the gate is up rests upon a friction-roller, t' , which is supported by an arm extending downward and under the bar S to the frame for a support.

The operation of my device is as follows: The clay to be made into bricks is dumped into the hopper near the rear end of the tempering-chamber without any water, unless it is unusually dry, and having been cut up by the knives and rendered in its passage to the screw sufficiently ductile, it is forced through the molding-orifice by the screw, and a steady stream, constituting a stiff slab of clay, is forced out over the support onto the rollers of the cutting-table, over which it travels until the gate V is reached. The moment the gate is touched by the end of the slab the inertia of the cutting-table is overcome and it moves with the slab. At this moment the operator should seize the cutting-frame and make the desired cut before the horizontal part of the arm u' passes over the friction-roller t' and the gate falls. If the gate is allowed to fall before the cut is completed, the entire pushing of the cutting-table falls onto the clamping device. Immediately with the fall of the gate the articles cut from the slab should be carried off to dry, and the cutting-table should be moved back to the front of the frame, so that the gate will resume its proper position by the arm passing over the friction-roller, and be ready for the next cut. Being provided with an abundance of rollers, the table is easily pushed under the gradually-advancing slab of clay.

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

1. A tubular tapering tempering-shaft constructed substantially as shown and described.

2. A removable flanged core-pin for holding the sleeves upon the tempering-shaft, substantially as shown and described.

3. A core-pin attached to the front end of the tempering-shaft and revolving freely within the core, substantially as shown and described.

4. A hollow core, in combination with a revolving core-pin, lubricating-washers, and nut, substantially as shown and described.

5. A revolving core-pin, washers, and nut, in combination with a hollow core and device for holding an angular core stationary, substantially as shown and described.

6. A locking device for the screw of a brick and tile machine, consisting of a tapering shaft having a rabbet along one of its sides, in combination with a screw-sleeve having an internal shoulder and flanged core-pin attached to the shaft, substantially as shown and described.

7. A lubricating-washer having a circular groove just within the periphery for containing a lubricant, said groove having one or more channels of communication with the central opening of the washer, substantially as shown and described.

8. In a brick and tile machine, the combination, substantially as shown and described, of a die-plate and a die having a centering-flange, substantially as shown and described.

9. In a brick and tile machine, a hollow tapering tempering-shaft sustained by two bearings, one in the rear end of the tempering-chamber and one at the rear end of the shaft, in combination with a cog-wheel attached to the shaft near the end, substantially as shown and described.

10. In a brick and tile machine, the combination of the cog-wheel and the pinion having a flange extending beyond its periphery with the pinion-shaft having a feather with its end close to the pinion, for the purpose of limiting the lateral play of the pinion, as set forth.

11. The gate having a projecting curved arm attached to its back, in combination with the friction-roller, arm, and frame, as set forth.

12. The pendant from the frame and a sliding bar operated by a lever having a spring attached to its long end, in combination with clamping-arms, substantially as shown.

13. A cutting-frame having a cam-bearing upon a friction-roller attached to a sliding bar, which is, in turn, attached to the short arms of clamping-arms pivoted to a pendant from the cutting-table, substantially as shown and described.

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Witnesses:

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