F. B. YINGLING.

TILE PRESS.

APPLICATION FILED OCT. 4, 1916.

1,308,213.

Patented July 1, 1919.

3 SHEETS—SHEET 1.

Fig. 1.

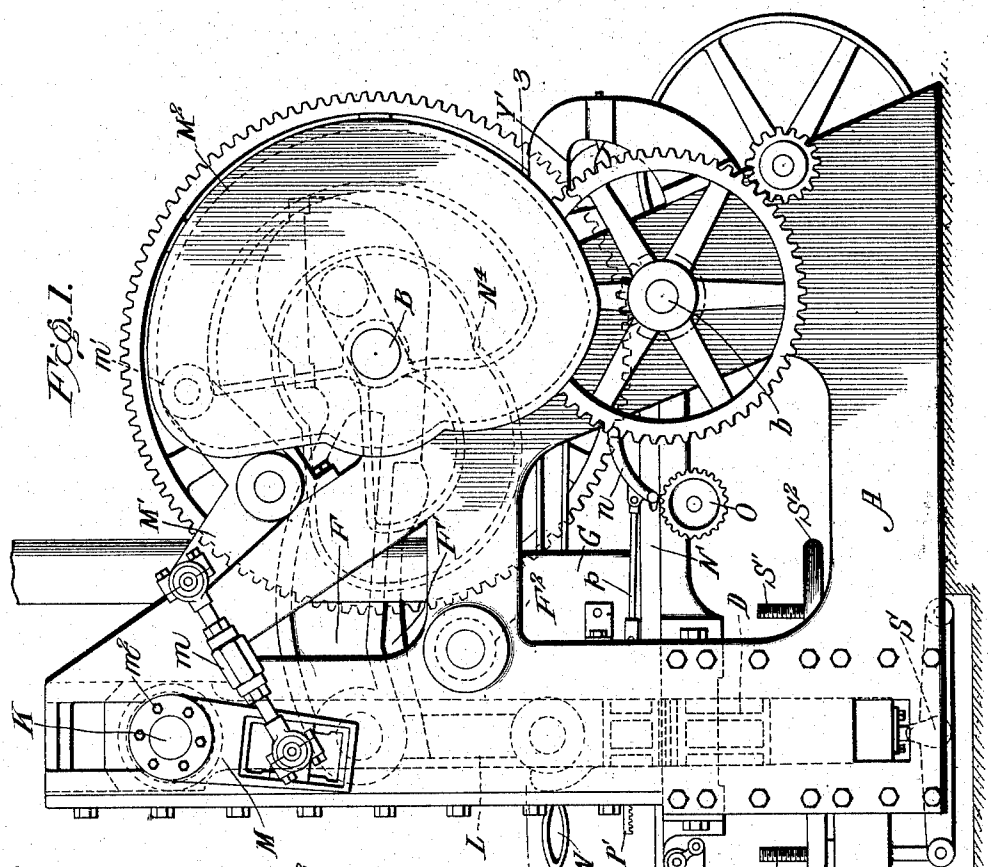
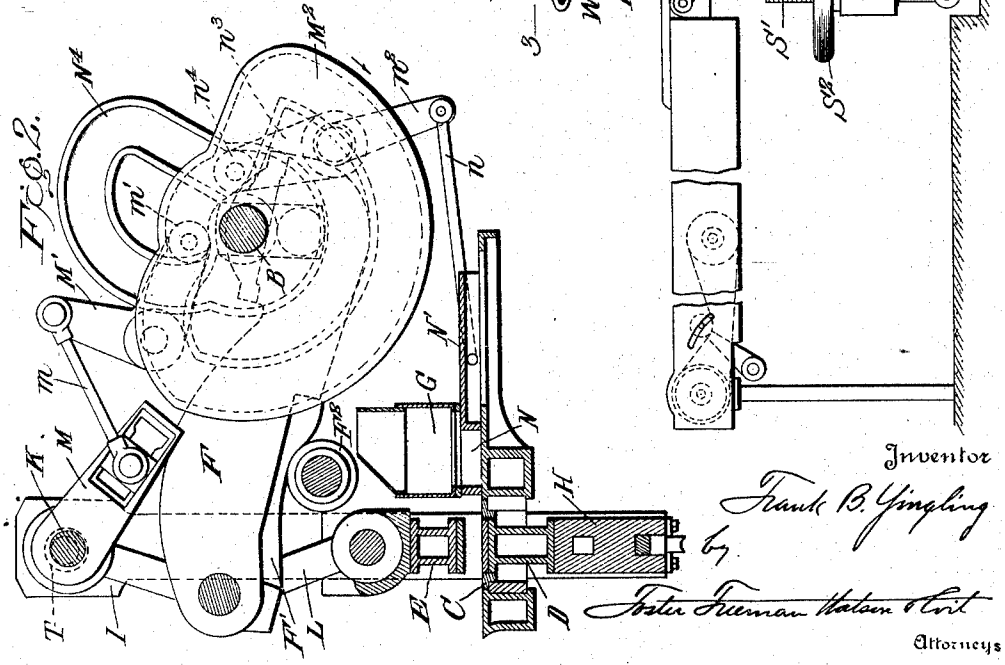


Fig. 2.



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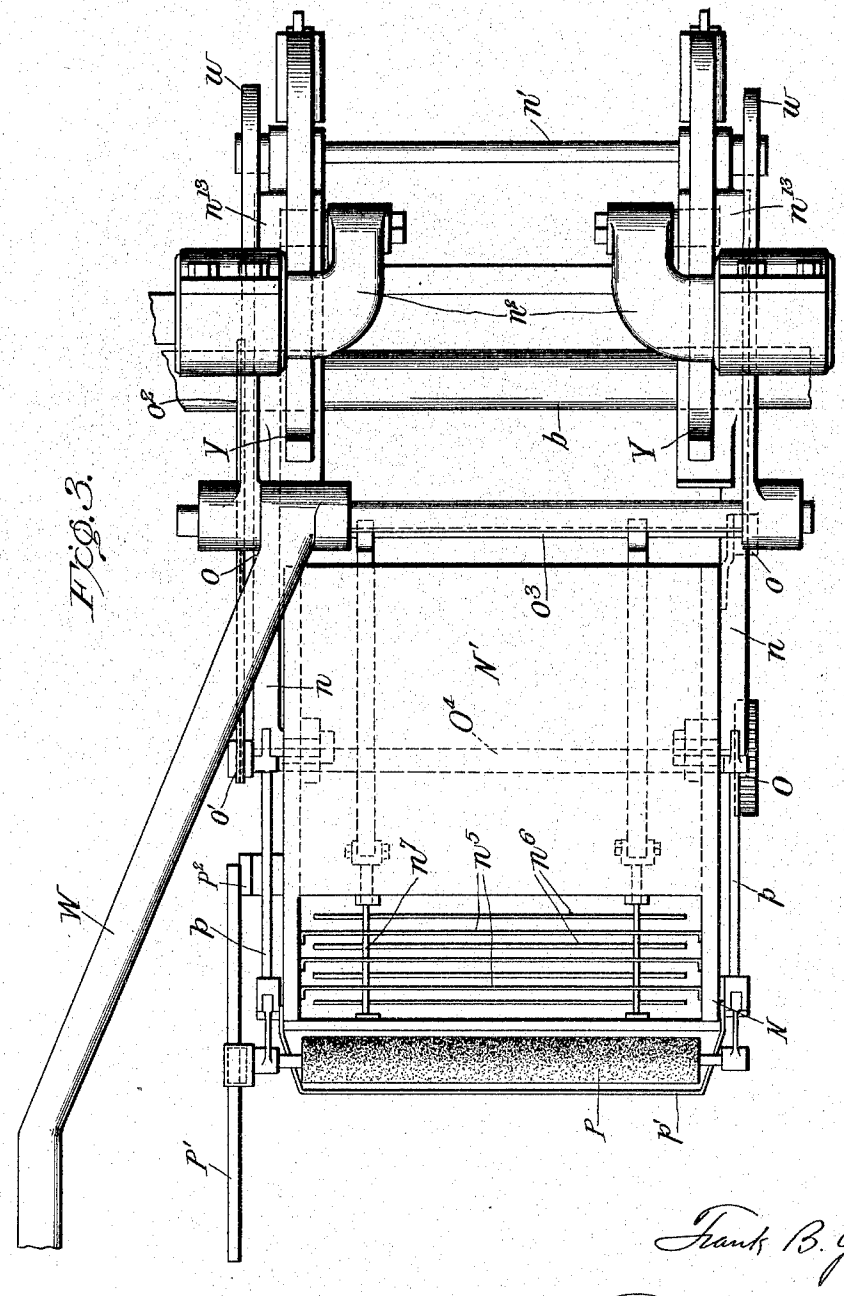
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3 SHEETS—SHEET 2.

FIG. 3.



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3 SHEETS—SHEET 3.

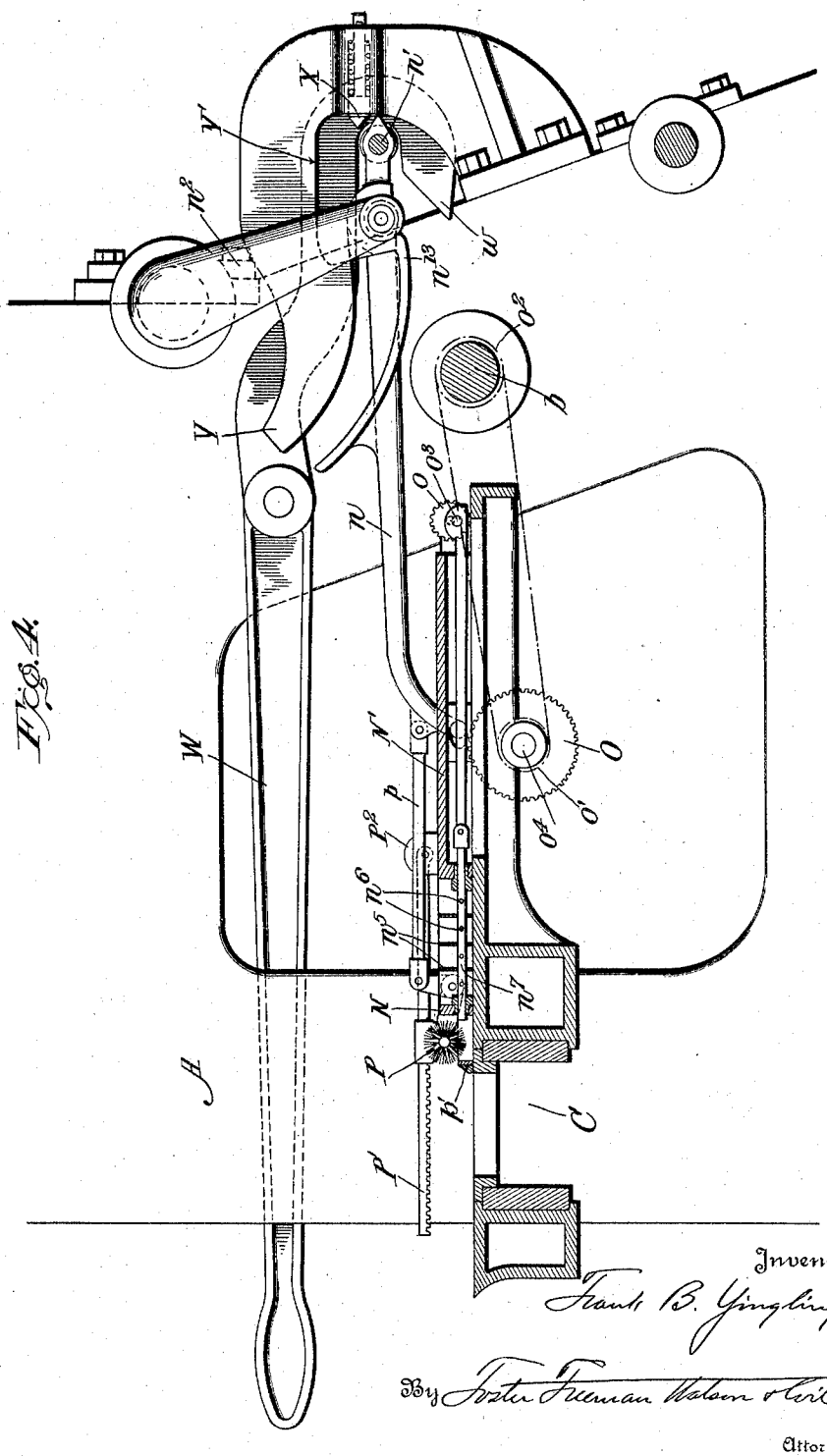


Fig. 4.

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TILE-PRESS.

1,308,213. Specification of Letters Patent. Patented July 1, 1919.

Original application filed May 9, 1914, Serial No. 837,536. Divided and this application filed October 4, 1916. Serial No. 123,678.

To all whom it may concern:

Be it known that I, FRANK B. YINGLING, a citizen of the United States, and resident of Hamilton, Butler county, State of Ohio, have invented certain new and useful Improvements in Tile-Presses, of which the following is a specification.

The present invention relates to improvements in tile presses and particularly to a means for supplying the material to be pressed to the mold dies, and maintaining such dies clean so that the tile produced thereby will be smooth, without pit marks or defects caused by the clay adhering to either the top or bottom dies.

In the accompanying drawings the improvements are shown as applied to a press of the form described and illustrated in a prior application filed May 9, 1914, Serial No. 837,536, of which application the present case is a division. The present improvements, however, are of course not limited in their use to a press of the particular construction illustrated.

In the accompanying drawings,

Figure 1 is a side elevation of a tile press embodying the present invention;

Fig. 2 is a sectional view of a portion of the press, the means for supplying clay to the dies being shown diagrammatically only;

Fig. 3 is a plan view of a portion of the machine, being substantially a section on the line 3—3 of Fig. 1;

Fig. 4 is an elevation partly in section of the parts shown in Fig. 3.

Referring to the drawings, and particularly to Figs. 1 and 2, the press comprises a main supporting frame A, a main power shaft B mounted in bearings in said frame, a mold box or casing C, a lower plunger or die D, an upper, toggle actuated plunger or die E, a pitman F connecting the die toggle with a crank on the shaft B, a clay reservoir or hopper G and a reciprocating mold charging device adapted to be reciprocated by cam mechanism actuated by the shaft B to convey a charge from the hopper to the mold casing.

The support H for the lower die D is carried by slides I fitted in suitable guide ways on the frame A; and the shaft K constituting the pivotal support for the upper member of the toggle by which the die E is carried is mounted in bearings in said slides I. The shaft K is of eccentric form in cross section relative to the end bearing portions and to one end thereof is suitably secured a crank M which is connected by a rod m with one arm of a bell crank M′ mounted on the frame of the machine and having its other end provided with a roller m' with which a cam M^2 on the power shaft B coöperates, whereby the eccentric, toggle supporting, shaft K will be rocked in its bearings during each rotation of the shaft B. As shown in Fig. 1, the connecting rod m is of such construction that the length thereof may be varied as desired to control the relative intensity of the two pressures obtained during each rotation of the main shaft A.

The pitman F is provided on its lower face with a cam plate F′ that is adapted to coöperate with a roller F^2 mounted in the main frame to effect simultaneous vertical movement of both of the dies, for ejecting the tile from the mold. The capacity of the mold, or the quantity of the material it can receive is regulated by a stop S, and wheels S^2 and screws S′. An eccentric bushing T is interposed between the eccentric portion of the shaft K and the upper member of the toggle, which surrounds such eccentric portion of the shaft, so that the relation of the shaft and toggle may be varied to adapt the press for producing tile of different thickness.

Clay is suitably supplied to the hopper or receptacle G and a quantity thereof sufficient to form a tile or number of tiles to be produced at each complete operation of the machine is periodically transferred from the hopper to the mold casing by a reciprocating charging device N. It will be understood that with a given adjustment of the parts of the toggle mechanism the ultimate travel of the die plates toward each other is the same, thus producing tile of uniform thickness; but the density is regulated by the amount of clay in the mold. The charging device comprises a rectangular shaped frame and a rearwardly extending plate or cut off member N′, which prevents escape of material from the hopper when the tubular section of the charging device is out of alinement with the opening in the bottom of said hopper. The charging device is provided at each side with a rearwardly extending rod or link n, the rear ends of which rods are connected by a cross bar n' and are adapted to be engaged by a pair of arms n^2,

mounted to rock about a common axis in the frame of the machine and one of which has at one end an upwardly extending arm n^3 which at its outer end is provided with a roller n^4 coöperating with a cam N^4 on the main power shaft B.

The charging device is provided with an agitator by means of which the charge of finely divided clay is deposited in the mold in an even uniform condition. As shown in Fig. 3, the chamber or charge receiving space is divided into a plurality of compartments by transverse partitions n^5 and in each of said compartments is arranged a wire or small rod n^6. The several wires n^6 are connected by rods n^7 which are adapted to reciprocate in suitable guides in the front and rear walls of the charge receiving pocket of the device N. The rear ends of these rods n^7 are connected by suitable links or bars with a crank shaft O^3 to which is attached a pinion o. Shaft O^3 is mounted in suitable bearings on the charging device and pinion o is adapted to engage with a gear O, mounted on a shaft O^4 in bearings on the main frame, when the pocket of the charging device is positioned above the mold casing. The gear O is constantly rotated by a sprocket O′ and a chain connecting it with a sprocket O^2 on the countershaft b geared to the shaft B.

At the forward end of the charging device there is arranged a brush P. This brush is mounted in bearings on the forwardly extending arms of a pair of bell crank levers at opposite sides of the charging device and the other arms of which levers are, by extensible rods p, connected with the charging device shifting rods n. As shown in Figs. 3 and 4, the forward ends of the rods n are provided with pins or connected to a cross bar mounted in slots in the side walls of the charging device, so that said rods are adapted to have a slight forward movement independent of any movement of the said charging device. This movement is sufficient to actuate the bell crank supports for the brush P and rock the latter downwardly into position to contact with the upper surface of the lower plunger or die D, as it is carried thereover by the actuation of the arms n^2. The rods p, being adjustably connected with the bell cranks and actuating means, permits of the necessary adjustment to compensate for wear of the brush and cause it to properly bear upon the surface of the die to effectually clean it. The brush shaft is provided with a suitable pinion that engages a rack P′ supported by a stationary stud or lug P^2 rising from the frame of the machine so that the brush will be rotated as it is moved over the die. As the return movement of the charging device begins, the bell crank supports for the brush P will be rocked to lift the brush above the plane of the upper surface of the mold box or casing and the charge of clay that has been deposited on the lower die therein.

By the construction and arrangement of parts illustrated herein the charge of clay within the mold box or casing is subjected to two distinct compressing actions by a single rotation of the main power shaft, the second of said compressing actions being materially stronger or heavier than the first. During the interval between said successive compressions the charge is relieved from pressure of the dies so that the air entrapped in the mold may freely escape.

In Fig. 2 the parts are shown in the positions occupied at the completion of a pressing operation with the lower die raised to the top of the mold box or casing and the upper die separated therefrom so that the finished tile may be pushed from the lower die onto a suitable table or conveyer. The charging device N is provided in advance of the rotary brush P with an ejector p' and as the shaft B turns in the direction indicated by the arrow in Fig. 2 the cam thereon will actuate the charging device to force the completed tile from the lower die and carry a suitable charge of clay over the lower die in the mold box or casing. During such movement of the charging device the brush P will, as before described, be caused to clean the upper surface of the die D and during the latter part of such movement the pinion o will be in mesh with the gear O so that the agitating means in the charging device will be operated. It will be seen that the stroke of the charging device is of such length that at the forward limit thereof a portion of the charge receptacle is beyond the front wall of the mold box or casing. This is important as it avoids any possibility of the clay being undesirably caked or compacted in one portion of the mold box more than another, during the return movement of the charging device.

While the brush P will maintain the lower die relatively clean, yet it is at times desirable to wash the faces of both the lower and upper dies; and as in the normal operation of the machine the charging device is between the dies whenever they are sufficiently separated, means have been provided whereby the charging device may be disconnected from the power shaft and caused to remain stationary beneath the hopper G during a rotation of said shaft. The means for effecting this adjustment are shown particularly in Figs. 3 and 4. The rods n by which the charging device is reciprocated, are not permanently connected to the arms n^2 but preferably each of said rods n is provided with a U-shaped section or recess into which a stud at the lower end of the adjacent arm n^2 is adapted to extend. By means of a lever W the rods n may be lifted from en-

gagement with said arms n^2, thereby disconnecting the charging device and power shaft and means are provided whereby the parts will be held thus disengaged during a complete rotation of the shaft. The handle W is mounted on a rock shaft which is provided with two rearwardly extending downwardly curved arms w adapted to respectively cooperate with rollers mounted at the ends of the rods n. Therefore it will be seen that if the handle W is depressed the arms w will positively lift the rods n from engagement with the crank arms n^2 and permit said crank arms to swing forward without imparting any movement to the charging device. A spring pressed stop X acts to hold the rods n in said elevated disconnected position and a curved guard n^{13} on each of the rods n coöperates with the adjacent roller at the lower end of the crank arm n^2 to prevent reëngagement of said crank and rod n until on the completion of the movement of the crank arm the parts are returned to relative position shown in Fig. 4. It is of course essential that means be provided to permit disengagement of the rods n and cranks n^2 only when the crank arms are in the position shown in Fig. 4 and the charging device is withdrawn from between the dies. This is provided for by a guard Y on the frame of the machine having at its rear end a recessed portion Y′ permitting upward movement of the rods n when the parts are related, as shown in Fig. 4.

I claim—

1. In a tile press, the combination of a mold casing, a lower die within said casing, an upper die movable into and from the casing, a charging device, means for moving the charging device to and from a position above the mold casing, a reciprocatory agitator within the charging device, a constantly running gear, and means for automatically connecting said gear and agitator to actuate the latter when the charging device is positioned to discharge its contents into the mold casing.

2. In a tile press, the combination of a mold casing, a lower die within said casing, an upper die movable into and from the casing, a charging device, means for moving the charging device to and from a position above the mold casing, a reciprocatory agitator within the charging device, a constantly running gear, a pinion movable with the charging device and adapted to mesh with said gear when the charging device is positioned to discharge its contents into the mold casing, and connections between the pinion and agitator whereby the latter will be reciprocated as the pinion rotates.

3. In a tile press, the combination of a lower die, an upper die, a power shaft, connections between the power shaft and dies for moving the latter to and from each other, a charging device, means normally connecting the power shaft and charging device and acting to move the latter to and from a position where it will deposit its contents on the lower die when the dies are suitably separated, and means adapted to disconnect the charging device from the power shaft operable only when the dies are out of pressing relation.

4. In a tile press, the combination of a lower die, an upper die, a power shaft, connections between the power shaft and dies for moving the latter to and from each other, a charging device, means connecting the power shaft and charging device and acting to reciprocate the charging device over the lower die when the dies are suitably separated, and a brush connected with the charging device and adapted to act upon the surface of the lower die when moving thereover in one direction and to be held from contact with the clay deposited on said die by the charging device when moving in the other direction.

5. In a tile press, the combination of a lower die, an upper die, a power shaft, connections between the power shaft and dies for moving the latter to and from each other, a charging device, means connecting the power shaft and charging device and acting to reciprocate the charging device over the lower die when the dies are suitably separated, a brush supported by the charging device and vertically adjustable to and from a position where it will contact with the lower die as it is moved thereover, and means whereby the brush will be automatically adjusted to and from its lower, operative, position, during each reciprocation of the charging device.

6. In a tile press, the combination of a lower die, an upper die, a power shaft, connections between the power shaft and dies for moving the latter to and from each other, a charging device, means connecting the power shaft and charging device and acting to reciprocate the charging device over the lower die when the dies are suitably separated, and a rotary brush connected with the charging device and adapted to act upon the surface of the lower die when moving thereover in one direction and to be held from contact with the clay deposited on said die by the charging device when moving in the other direction.

7. In a tile press, the combination of a lower die, an upper die, a power shaft, connections between the power shaft and dies for moving the latter to and from each other, a charging device, means connecting the power shaft and charging device and acting to reciprocate the charging device over the lower die when the dies are suitably separated, a brush arranged in advance of the charging device and pivotally connected

therewith to permit it to be adjusted vertically, and means for automatically shifting said brush to its lower position and maintaining it in that position during movement of the charging device to convey clay between the dies and for holding the brush from such operative position during movement of the charging device in the opposite direction.

8. In a tile press, the combination of a lower die, an upper die, a power shaft, connections between the power shaft and dies for moving the latter to and from each other, a charging device, means connecting the power shaft and charging device and acting to reciprocate the charging device over the lower die when the dies are suitably separated, a pair of bell cranks mounted on opposite sides of and projecting forward from the charging device, a brush supported in the forwardly extending arms of said bell cranks, and means for rocking the bell cranks to lower the brush into position to contact with the upper surface of the lower die as the charging device is moved between the dies and to return the brush to its normal elevated position as the charging device commences to move in the opposite direction.

9. In a tile press, the combination of a lower die, an upper die, a power shaft, connections between said shaft and dies for operating the latter, a charging device adapted to move to and from a position between the dies, connections between the charging device and shaft including a manually shiftable member whereby the shaft may be disconnected from said device, and means for preventing such disconnection when the charging device is positioned between the dies.

10. In a tile press, the combination of a lower die, an upper die, a power shaft, connections between said shaft and dies for operating the latter, a charging device adapted to move to and from a position between the dies, a rock shaft adapted to be actuated at each rotation of the power shaft, a rod pivotally connected with the charging device and adapted to be detachably connected to said rock shaft, whereby the charging device may be disconnected from the power shaft, and means preventing such disconnection when the charging device is between the dies.

11. In a tile press, the combination of a lower die, an upper die, a power shaft, connections between said shaft and dies for operating the latter, a charging device adapted to move to and from a position between the dies, detachable connections between the charging device and shaft, a hand lever adapted to disconnect the power shaft from the charging device, and means for positively preventing movement of said lever when the charging device is moving or is positioned between the dies.

12. In a tile press, the combination of upper and lower dies, a power shaft, means actuated by the shaft for effecting relative movement between the dies, a charging device movable to and from a position between the dies, means normally connecting the power shaft and charging device, means for automatically agitating material within the charging device as the latter is positioned between the dies, and means adapted to disconnect the charging device and power shaft operable only when the charging device is withdrawn from between the dies.

13. In a tile press, the combination of upper and lower dies, a power shaft, means actuated by the shaft for effecting relative movement between the dies, a charging device movable to and from a position between the dies, connections between the power shaft and charging device, means for automatically agitating material within the charging device as the latter is positioned between the dies, and a manually adjustable means for disconnecting the power shaft from the charging device when the latter is at the limit of its movement away from the dies.

In testimony whereof I affix my signature.

FRANK B. YINGLING.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."