July 25, 1939. F. M. KINNARD 2,167,386

CLAY-WORKING MACHINE

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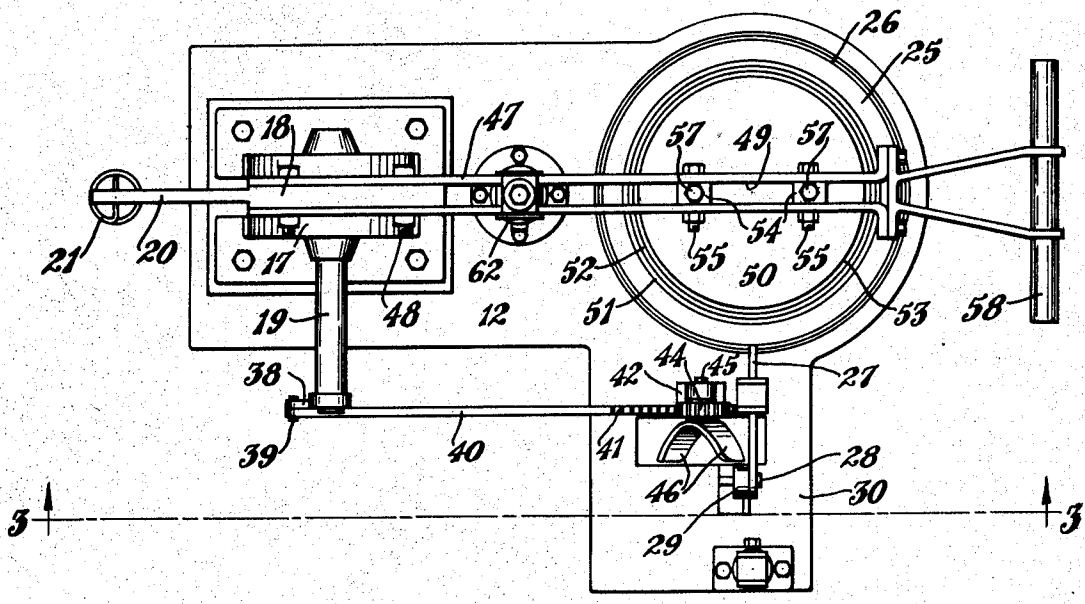
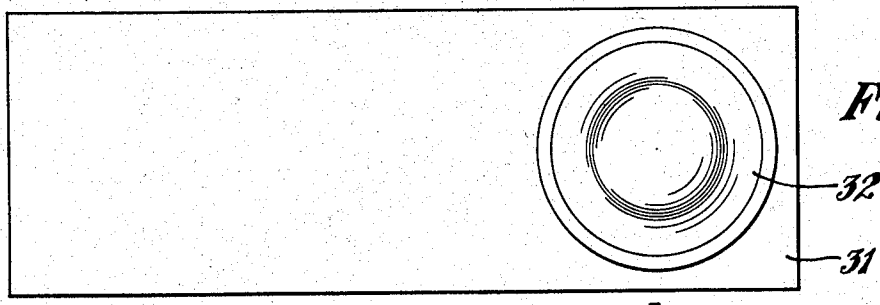


Fig. 1



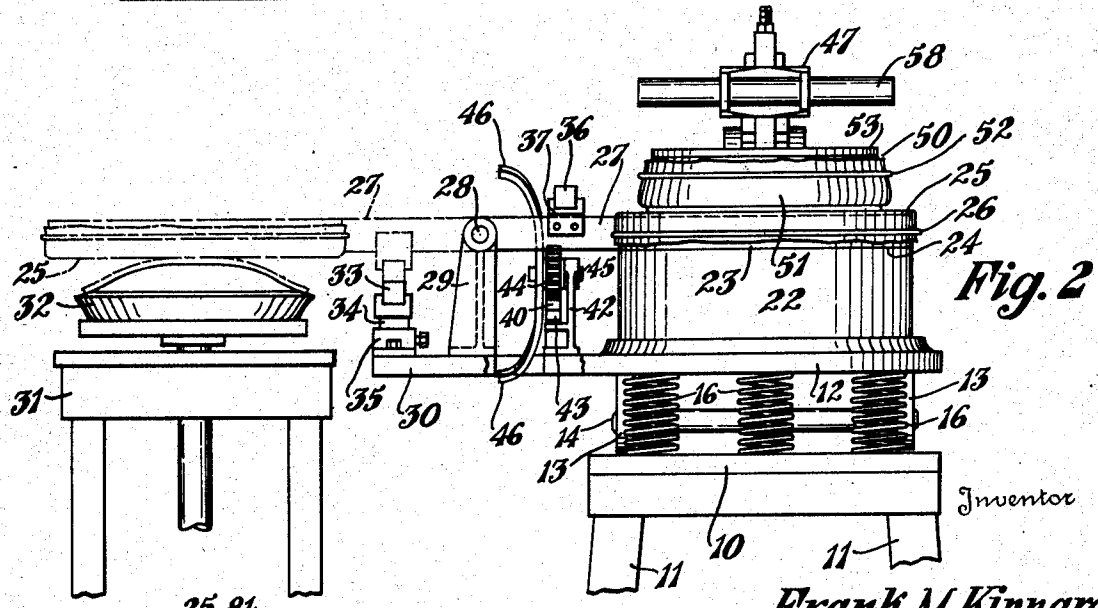


Fig. 2

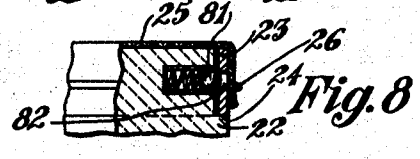


Fig. 8

Inventor

Frank M. Kinnard

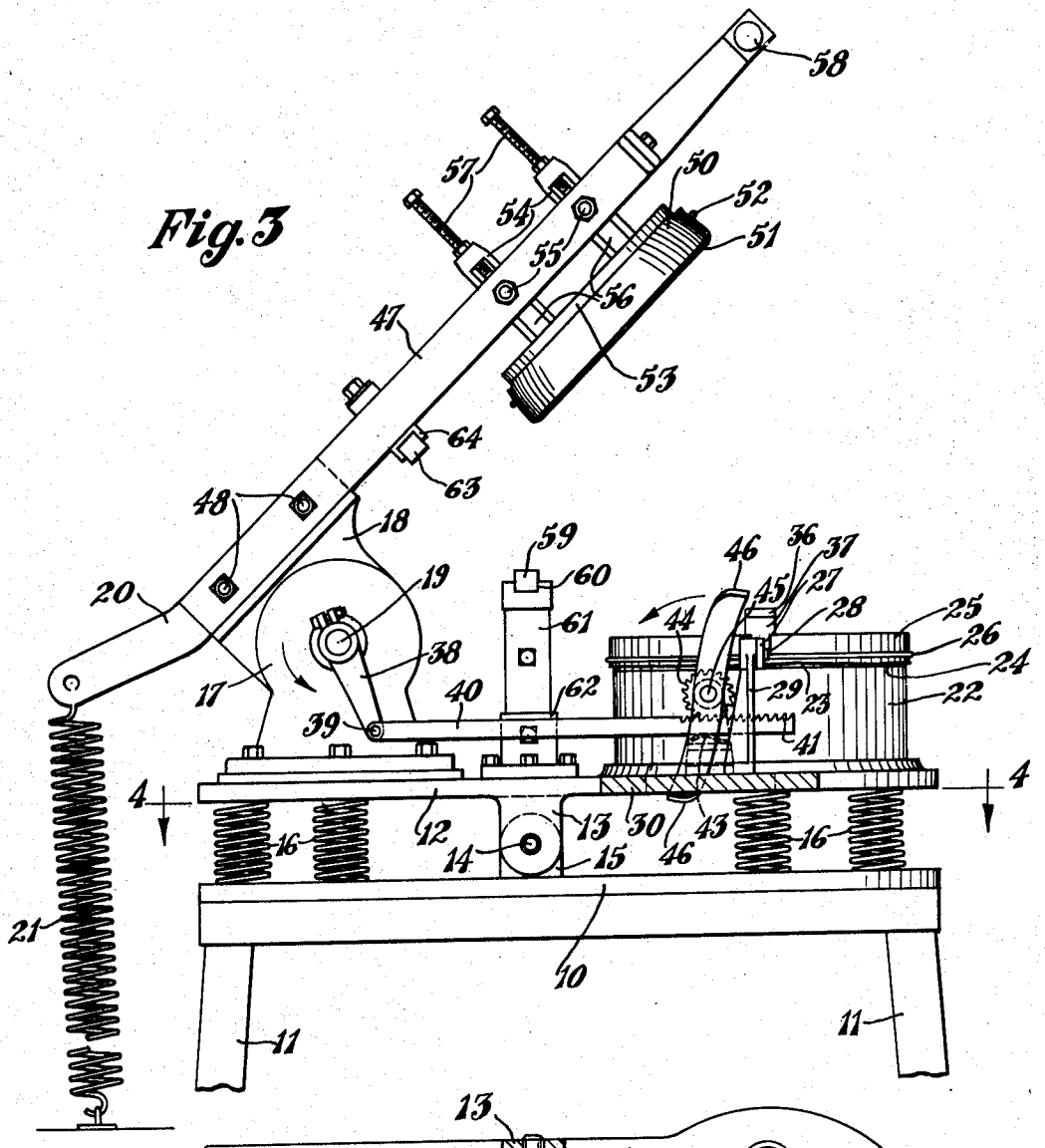
By Frease and Bishop Attorneys

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Fig. 3



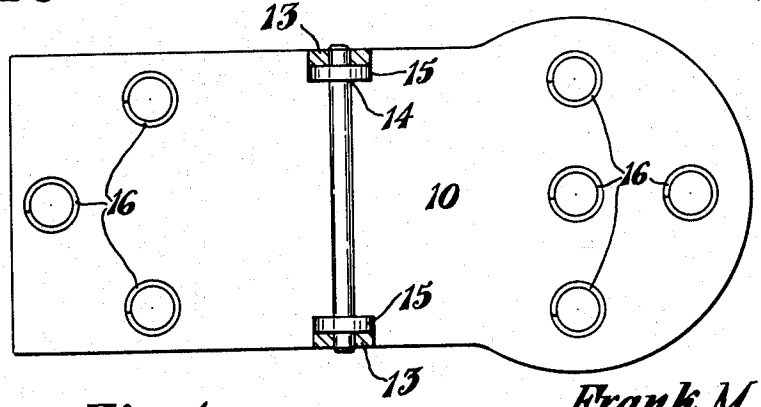


Fig. 4

Inventor

Frank M. Kinnard

By Fraser and Bishop

Attorneys

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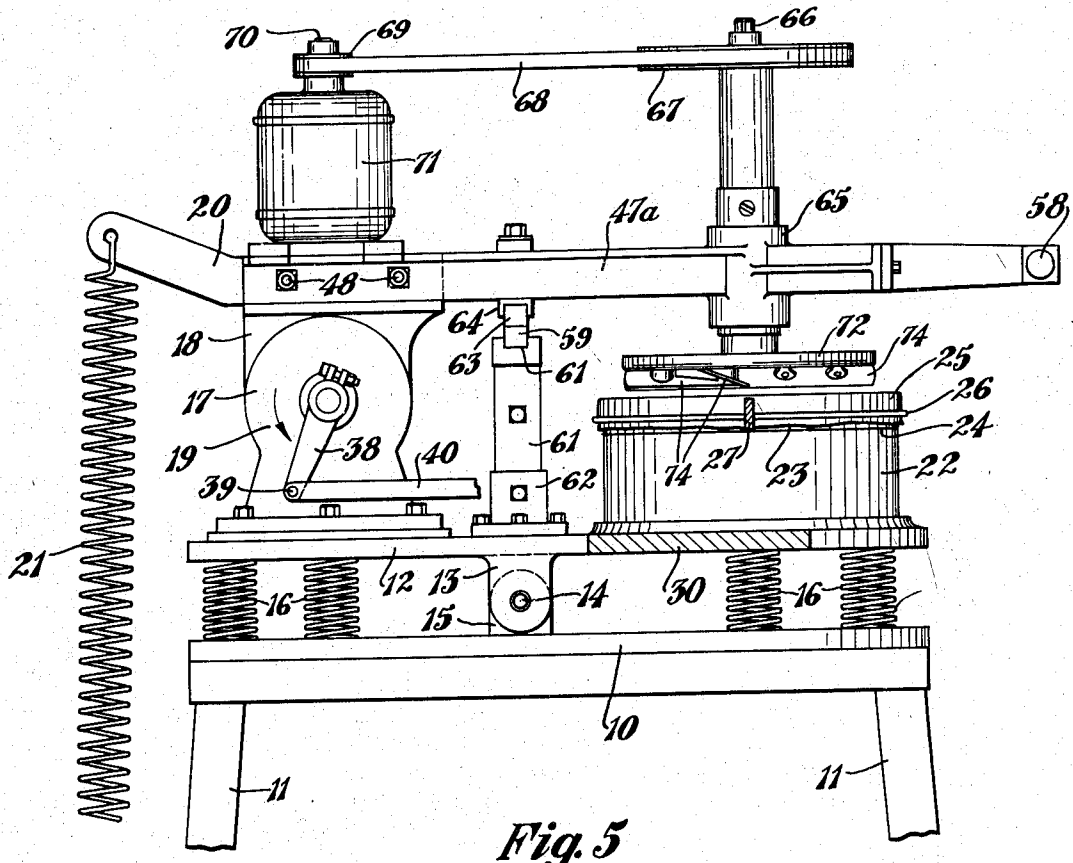


Fig. 5

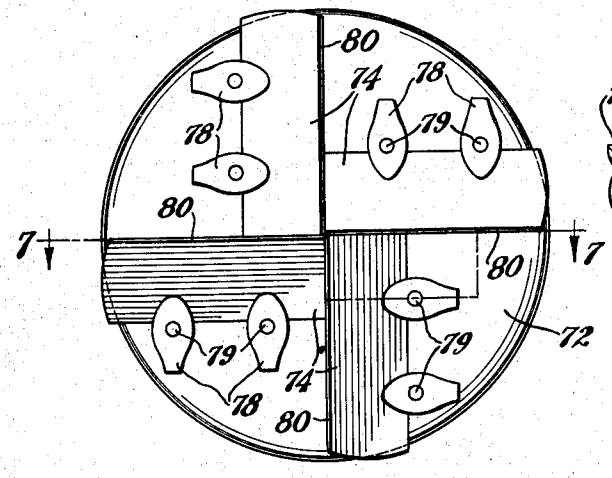


Fig. 6

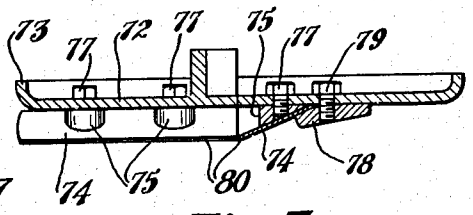


Fig. 7

Inventor

Frank M. Kinnard

By Frease and Bishop

Attorneys

Patented July 25, 1939 2,167,386

UNITED STATES PATENT OFFICE

2,167,386

CLAY-WORKING MACHINE

Frank M. Kinnard, Sebring, Ohio

Application September 10, 1937, Serial No. 163,203

11 Claims. (Cl. 25—22)

The invention relates to machines for use in potteries, and more particularly to the type of machines generally known as batters or spreaders for batting out lumps or balls of clay into what is known in the potteries as a bat, preparatory to placing the same upon a mold where it may be jiggered, and the present application is an improvement upon my prior patents No. 1,430,309 granted September 26, 1922, and No. 1,462,812 granted July 24, 1924.

An object of the present invention is to provide a machine of this type mounted upon a cushioned bed whereby vibration due to the operation of the machine is reduced to a minimum, making it possible to use the machine upon upper floors of a building without causing damage to ware in the process of manufacture therein.

Another object is to provide such a machine which may be quickly and easily converted from a batter to a spreader whereby either very cheap ware or more expensive ware may be made upon the same machine.

A further object is to provide such a machine in which the finished bat of clay may be readily transferred from the batter or spreader to the mold without requiring the operator to touch the bat with his hands.

A still further object is to provide means whereby the clay bat is automatically transferred to the mold as the batter or spreader completes its work and moves to the initial position.

Another object is to provide a flannel covered batter to prevent the clay from sticking thereto.

Still another object is to provide a drum head of flannel or the like stretched across a ring adapted to fit upon a block of plaster or the like, upon which the bat is formed.

A further object is to provide means for moving said ring and drum head to transfer the finished clay bat to the mold and automatically return the ring and drum head to position upon the block.

A still further object is to provide a new and improved spreader tool so constructed that the clay will not climb up upon the blades thereof.

The above objects, together with others that will be apparent from the drawings and following detail description, or which may be later referred to, may be attained by constructing the improved machine in the manner illustrated in the accompanying drawings, in which

Figure 1 is a plan view of the improved clay working machine, showing the same in the position in which a bat is being formed;

Fig. 2, an end elevation of the machine shown in Fig. 1;

Fig. 3, a sectional elevation taken as on the line 3—3, Fig. 1, showing the operating lever or arm of the machine equipped with a batter and in the initial or inoperative position;

Fig. 4, a plan sectional view of the cushion means for the bed or table of the machine, taken as on the line 4—4, Fig. 3;

Fig. 5, a sectional elevation of the machine showing the operating lever or arm of the machine equipped with a spreader tool and in the position in which a bat is being formed;

Fig. 6, a bottom plan view of the improved spreader tool;

Fig. 7, a section through the tool taken as on the line 7—7, Fig. 6; and

Fig. 8, an enlarged detail sectional view showing the friction catch for holding the ring and drum head upon the block.

Similar numerals refer to similar parts throughout the drawings.

The machine may be mounted upon a base 10 supported at the desired height above the floor as by legs 11. The bed plate or table 12 is adapted to be cushioned upon the base 10 and for this purpose may be provided intermediate its ends with depending lugs 13 pivoted as at 14 to the upstanding ears 15 upon the base. A plurality of coil springs 16, or other cushion means, is interposed between each end portion of the base 10 and the pivoted bed or table 12 and arranged to normally hold said bed in horizontal position, as shown in the drawings.

A bearing bracket 17 is mounted upon one end portion of the bed or table 12 and a depending journal bracket 18 is journaled thereto as by the journal 19 and has fixed thereto an arm 20, to the rear end of which may be connected a pull spring 21, counterweight or the like, arranged to normally hold said arm in the raised position, as shown in Fig. 3.

A cylindric block 22 of plaster or the like is mounted upon the other end portion of the bed or table 12 and instead of forming the clay bat directly upon the top of said block as in my prior patents above referred to, a ring 23 of metal or the like may be adapted to seat around the reduced upper end portion of the block and upon the shoulder 24 thereof, said ring carrying a drum head 25 of flannel or the like which is stretched tightly over the ring and held thereon as by a clamping wire or ring 26, the drum head being adapted to normally rest upon the top surface of the block as best shown in Fig. 8.

The ring 23 may be carried by a lever 27 fulcrumed at its end as at 28 upon a bearing bracket 29 supported upon the ear 30 formed at one side of the bed or table 12.

The jigger bench, indicated generally at 31, may be of usual and well known construction and is so located relative to the bed 12 that when the ring 23 and drum head 25 are swung outward upon the fulcrum 28, the drum head will register with the rotatable mold 32 carried upon said jigger bench and adapted to operate in usual manner.

A bumper 33 of rubber or the like may be carried upon a post 34 adjustably mounted in the sleeve 35 located upon the ear 30 of the bed at a point intermediate the bracket 29 and the jigger bench and adapted to be engaged by the bumper 36 mounted upon the lever 27 as by the bracket 37.

For the purpose of automatically throwing the lever 27 from the full line to the broken line position as shown in Fig. 2, as the lever 20 moves to the raised or initial position, as indicated in Fig. 3, operating mechanism may be provided controlled by the rotation of the journal 19.

In order to accomplish this, the journal 19 may be extended some distance beyond the one side of the bearing bracket 17, as best shown in Fig. 1, a rocker arm 38 being fixed to the end thereof and pivotally connected as at 39 to one end of a ratchet link 40, the free end of which is provided with ratchet teeth 41, and is slidably mounted upon a bracket 42 provided with a spring 43 for normally urging the ratchet teeth of the link 40 into engagement with a ratchet wheel 44 journaled as at 45 upon the bracket 42 and fixed to the center portion of a lever having curved end portions 46.

The improved machine is so constructed that it may be quickly and easily converted into either a batter or a spreader, depending upon whether it is desired to make inexpensive ware or ware of higher quality. For this purpose, the arm 20 is provided with interchangeable portions 47 and 47*a* which carry the batter and the spreader tool respectively. Each of these interchangeable portions of the arm may be provided with a bifurcated end adapted to be attached to the main portion of the arm as by two bolts 48, whereby it will be obvious that the machine may be quickly and easily converted to either a batter or a spreader.

The arm 47 may be slotted as indicated at 49, for the purpose of adjustably mounting the batter 50 thereon. This batter may be formed of plaster or the like as in usual practice and for the purpose of preventing the clay from sticking thereto, may be covered with flannel or similar material as indicated at 51, which is stretched tightly over the face of the batter and held thereon as by the clamping ring or wire 52.

The batter may be mounted upon the underside of the base plate 53 as in usual and well known practice and a pair of slotted uprights 54 is fixed upon the upper side of the base plate and extended through the slot 49 of the portion 47 of the arm, bolts 55 carried by said portion 47 of the arm being located through the longitudinal slots 56 in the upright members 54 and adjusting screws 57 may be threaded through the upper ends of the uprights 54 and extend downwardly through the slots therein to engage the bolts 55 in the manner disclosed in my prior Patent No. 1,462,812 above referred to.

A handle 58 may be provided at the free end of the arm for manually swinging the arm from the position shown in Fig. 3 to that shown in Fig. 5. A block 59 of rubber or the like is mounted in the socket 60 formed at the upper end of the post 61 which may be adjustably mounted in the sleeve 62 mounted upon the bed or table 12, and is adapted to be engaged by a similar block 63 of rubber or the like mounted in a bracket 64 carried by the arm and acts as a bumper for the arm when the same is manually swung down to operative position.

The removable portion 47*a* of the arm is provided with a vertical bearing 65 adapted to be located concentric to the block 22 when the arm is in lowered or operative position as shown in Fig. 5, a shaft 66 being journaled through said bearing and provided with any suitable means for rotating the same, such as the pulley 67 connected by a belt 68 with a pulley 69 upon the shaft 70 of the motor 71 which may be carried by the removable portion 47*a* of the arm.

The spreader tool carried by the shaft 66 is an improvement over the spreader tool shown in my prior Patent No. 1,430,309 above referred to and also over the spreader tool disclosed and claimed in my prior Patent No. 1,481,913 of January 29, 1924, being designed to prevent creeping of the clay upward on the blades of the tool even more efficiently than is possible in the construction disclosed in the latter patent.

The improved spreader tool may be provided with two or more blades, but for the purpose of illustration, a four-bladed tool is shown as it has been found by experience that this makes a very practical spreader tool.

The improved spreader tool may include a disk 72 connected to the lower end of the shaft 66 and preferably provided with the rounded upturned peripheral flange 73. The radially disposed blades are in the form of flat metal strips 74 connected to the underside of the disk 72 in such manner that each blade is laterally located at substantially 25° to the plane of the disk 72.

For this purpose, wedge nuts 75 may be bolted to the underside of the disk as by the bolts 77, each blade being held clamped against the inclined face of the corresponding nuts 75 as by wedge nuts 78 engaging the upper edge portion of the blade and clamped thereagainst as by bolts 79 located through the disk 72. By locating the blades at this angle and leaving the working edge 80 of each blade free, it has been found that a machine may be operated continuously throughout an entire working day, at the end of which practically no clay has crept up upon the blades. Each blade has a smooth, straight working edge 80, which may be filed or ground to be kept in this condition after long use, although it has been found by experience that there is very little wear upon the edges of these blades.

In operating the machine to form a bat of clay, the arm 20 provided with either the batter or spreader tool is manually moved, by means of the handle 58, from the position shown in Fig. 3 to that shown in Fig. 5, batting or spreading the ball of clay, which has been placed upon the drum head 25, into a flat, smooth clay bat. The operator then releases the handle 58 and the spring 21 throws the arm back to the position shown in Fig. 3. With this operation of the arm, the lever or rocker arm 38 is moved in the direction of the arrow to the position shown in Fig. 3, one of the curved lever arms 46 moving in the direction of the arrow in Fig. 3, swinging upward and striking the underside of the lever 20 with sufficient force to throw the same upon its pivot

28 from the full line to the dotted line position shown in Fig. 2.

As the bumper 36 of said lever 27 strikes the bumper 33 upon the post 34, the drum head 25 will be vibrated sufficiently to throw the bat therefrom and onto the mold 32. The arm 27 strikes the bumper 33 with sufficient force to throw said arm back to the initial position shown in the drawings, permitting the spring pressed ball 81, carried in a socket in the block 22, to engage the socket 82 in the ring 23, latching the ring and drum head in this position.

As the arm 20 is again moved down to operative position, the ratchet teeth 41 of the link 40 will ride over the teeth of the ratchet wheel 44 without rotating the same. The mold 32 may then be rotated as is common practice in jigger benches and the plate or other ware may be jiggered upon the mold, thus producing a smooth surface upon both sides of the ware.

I claim:

1. A clay working machine including a block, an arm pivoted adjacent to said block, a bat forming tool carried by said arm, a ring adapted to surround said block, a drum head carried by said ring and adapted to cover the top of the block, and a lever upon which said ring is carried.

2. A clay working machine including a block, an arm pivoted adjacent to said block, a bat forming tool carried by said arm, a ring adapted to surround said block, a drum head carried by said ring and adapted to cover the top of the block, a lever upon which said ring is carried, and a mold located in position to receive a bat of clay from said drum head when the lever is operated.

3. A clay working machine including a block, an arm pivoted adjacent to said block, a bat forming tool carried by said arm, a ring adapted to surround said block, a drum head carried by said ring and adapted to cover the top of the block, a lever upon which said ring is carried, a mold located in position to receive a bat of clay from said drum head when the lever is operated, and means for returning said ring and drum head to normal position.

4. A clay working machine including a block, an arm pivoted adjacent to said block, a bat forming tool carried by said arm, a ring adapted to surround said block, a drum head carried by said ring and adapted to cover the top of the block, a mold spaced from said block, and means operated by the raising of the arm to move the ring over the mold to transfer a clay bat from the drum head to the mold.

5. A clay working machine including a block, an arm pivoted adjacent to said block, a bat forming tool carried by said arm, a ring adapted to surround said block, a drum head carried by said ring and adapted to cover the top of the block, a mold spaced from said block, means operated by the raising of the arm to move the ring over the mold to transfer a clay bat from the drum head to the mold, and means for returning the ring and drum head to normal position.

6. A clay working machine including a block, an arm pivoted adjacent to said block, a bat forming tool carried by said arm, a ring adapted to surround said block, a drum head carried by said ring and adapted to cover the top of the block, a lever upon which said ring is carried, a mold spaced from said block, and a bumper located between the block and mold in the path of said lever.

7. A clay working machine including a block, an arm pivoted adjacent to said block, a bat forming tool carried by said arm, a ring adapted to surround said block, a drum head carried by said ring and adapted to cover the top of the block, a lever upon which said ring is carried, a mold spaced from said block, a bumper located between the block and mold in the path of said lever, and means operated by the raising of the arm for swinging said lever against said bumper so as to transfer a bat of clay from the drum head to the mold and return the lever to normal position.

8. A spreader tool including a rotatable spindle, and radially disposed blades at the end of the spindle, each blade comprising a flat strip inclined laterally to a plane perpendicular to the spindle and having a free outer edge.

9. A spreader tool including a rotatable spindle, and radially disposed blades at the end of the spindle, each blade comprising a flat strip inclined laterally at an angle of substantially 25° to a plane perpendicular to the spindle.

10. A spreader tool including a rotatable spindle, and radially disposed blades at the end of the spindle, each blade comprising a flat strip inclined laterally at an angle of substantially 25° to a plane perpendicular to the spindle and having a free outer edge.

11. A spreader tool including a rotatable spindle, a disk fixed to the end of the spindle and radially disposed blades carried by the disk, each blade comprising a flat strip inclined laterally at an angle of substantially 25° to the normal plane of the disk and having a free outer edge.

FRANK M. KINNARD.