

C. H. MUCKENHIRN.
MECHANICAL BATTER.

APPLICATION FILED JUNE 26, 1919. RENEWED DEC. 20, 1921.

1,423,009.

Patented July 18, 1922.

5 SHEETS—SHEET 1.

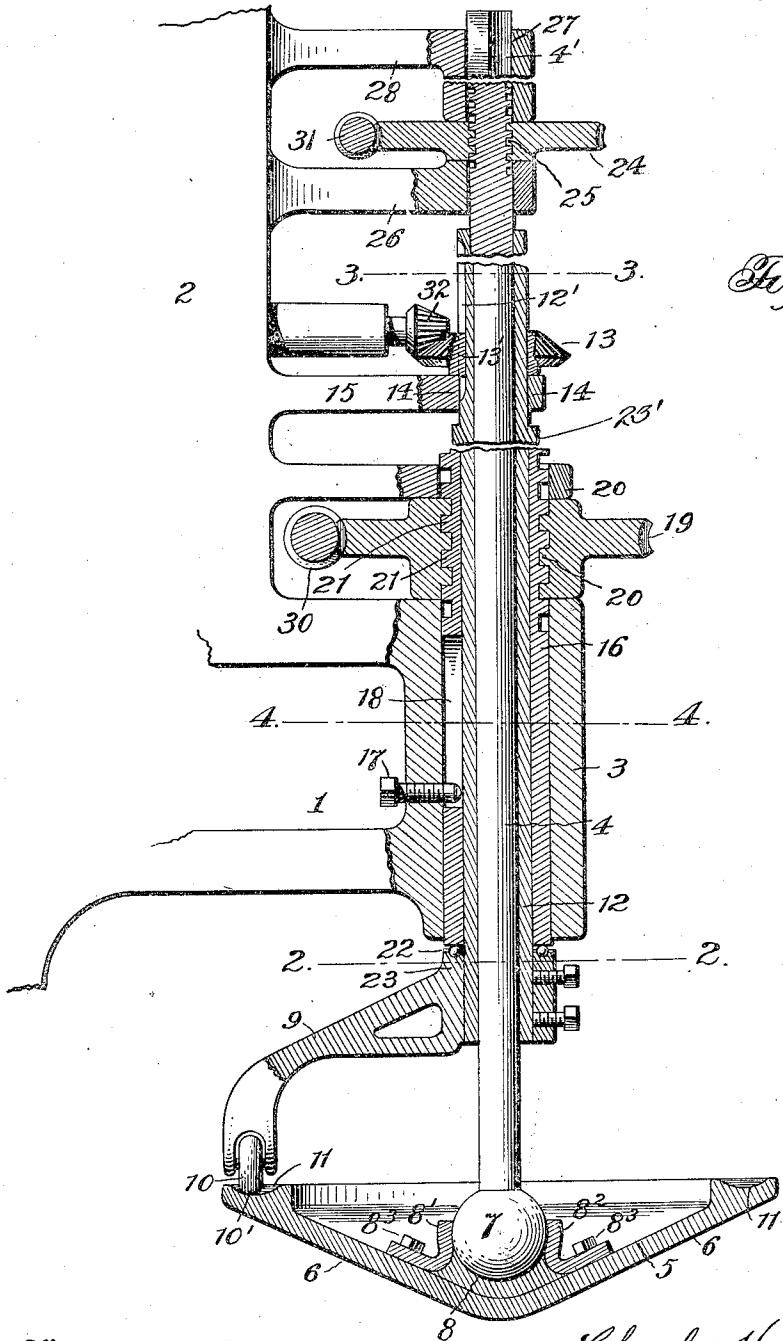


Fig. 1.

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5 SHEETS—SHEET 2.

Fig. 2.

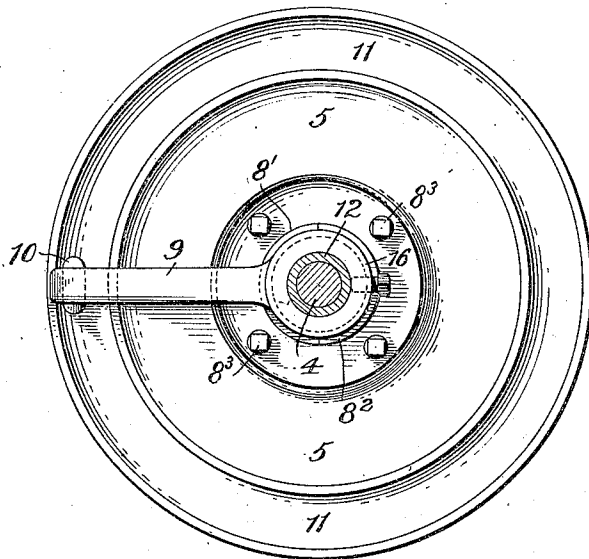


Fig. 3.

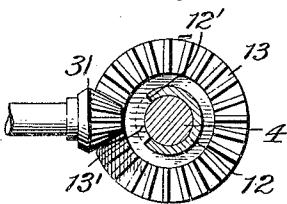
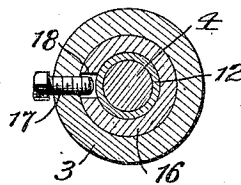


Fig. 4.



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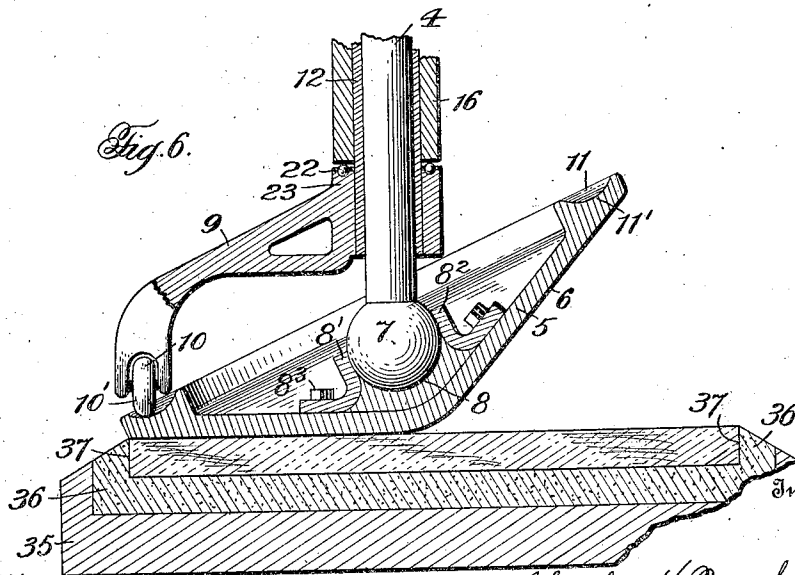
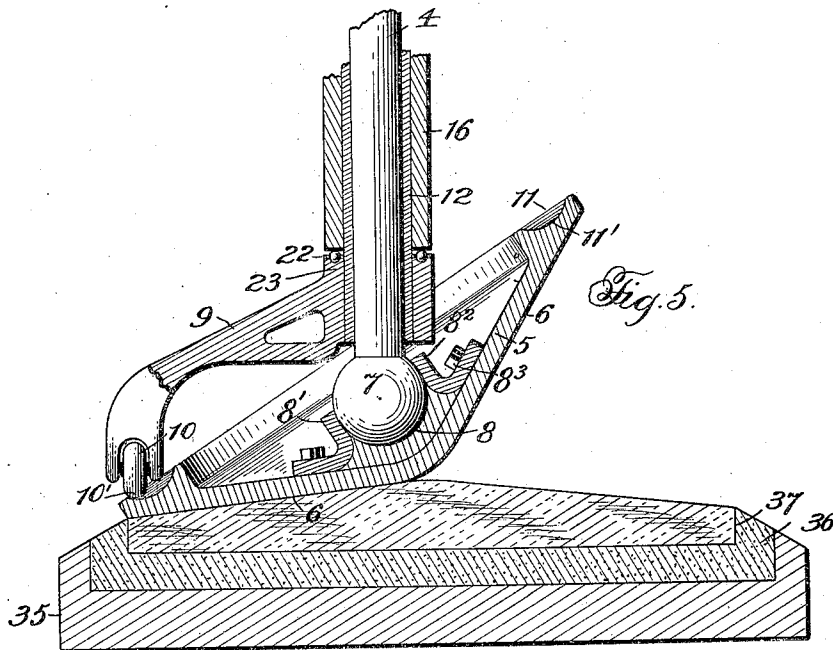
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5 SHEETS—SHEET 4.

Fig. 7.

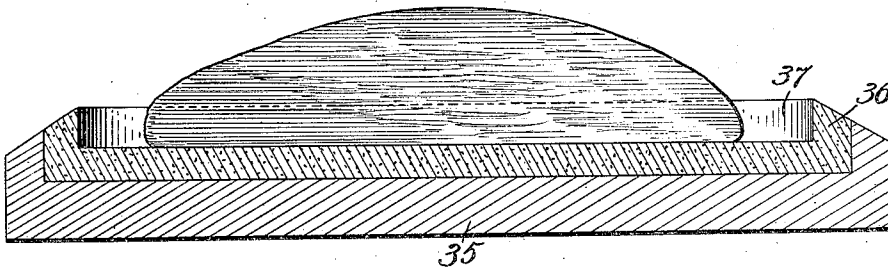
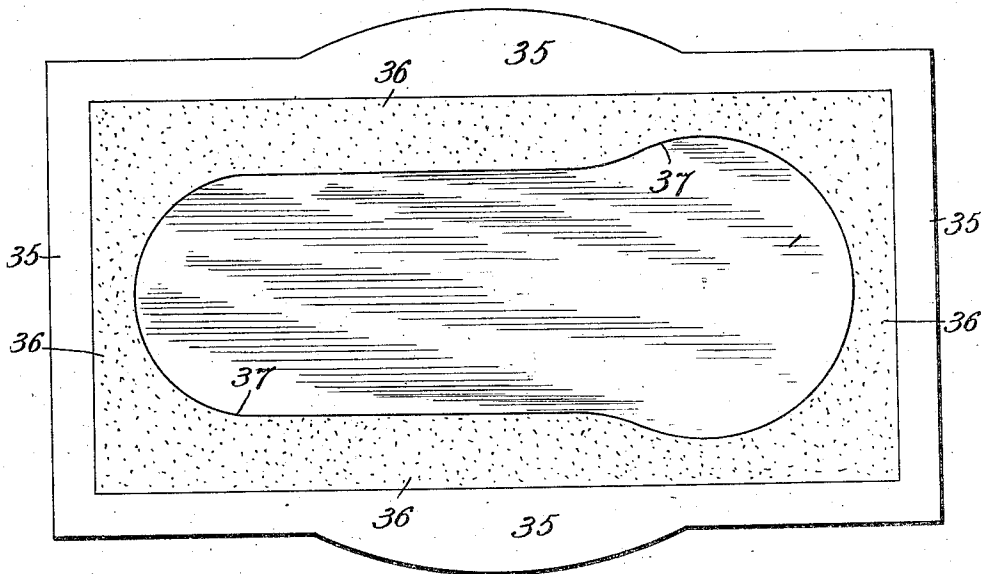


Fig. 8.



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5 SHEETS—SHEET 5.

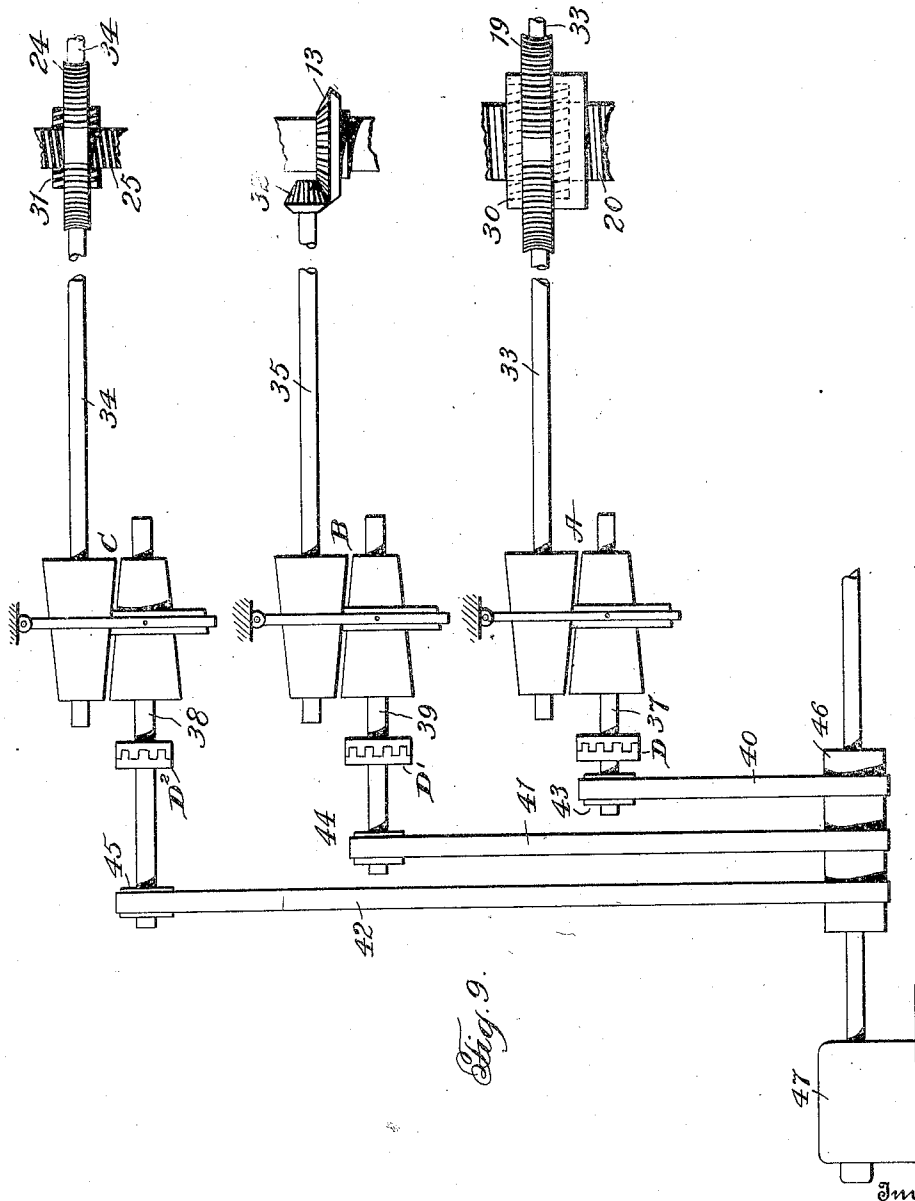


Fig. 9.

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UNITED STATES PATENT OFFICE.

CHARLES H. MUCKENHIRN, OF DETROIT, MICHIGAN.

MECHANICAL BATTER.

1,423,009.

Specification of Letters Patent.

Patented July 18, 1922.

Application filed June 26, 1919, Serial No. 306,853. Renewed December 20, 1921. Serial No. 523,772.

To all whom it may concern:

Be it known that I, CHARLES H. MUCKENHIRN, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Mechanical Batters, of which the following is a specification, reference being had therein to the accompanying drawing.

advantages thereof and the particular construction and arrangement of parts comprising the same will be understood from the following detail description, when considered in connection with the accompanying drawings, forming part hereof and illustrating one embodiment of the invention.

In the drawings:

Figure 1 is a vertical sectional view of an apparatus constructed in accordance with the present invention.

Figs. 2, 3 and 4 are transverse sections on the lines 2—2, 3—3, 4—4, respectively, of Figure 1.

Figs. 5 and 6 are detail sectional views of the pressing and forming member and the lower portion of the support and actuating means therefor illustrating different positions of the forming and pressing member in producing bats of different form.

Fig. 7 is a detail side elevation of a roll or mass of clay in position on the block for treatment by the forming and pressing member, and

Fig. 8 is a top plan view of the block or mold box and a slab of clay after the same has been operated upon by the forming and pressing apparatus.

Fig. 9 is a detail side elevation of the drive connections.

The invention comprehends a mechanically operated clay pressing and forming member that tilts or rocks from side to side in different vertical planes about a circle, adapted to gradually change a roll or mass of clay from a roughly cylindrical shape to a flattened or sheet form while constantly pressing or forcing the mass of clay, without stretching or pulling it, by applying a constant pressure at approximately the center of the mass and gradually working the same outwardly from the center.

While I have illustrated in the drawings a specific embodiment of the invention, it will of course be understood that changes in and obvious variations of the particular construction shown, and the carrying out of the invention in other forms as will appeal to those skilled in the art and falling within the scope of the appended claims, may be practiced without departing from the spirit of the invention.

Referring to a detail description of the drawings, wherein like reference characters designate corresponding parts throughout

This invention relates to an improved mechanical batter or means for performing that process in the manufacture of clay wares known as "batting out" which consists in the flattening or spreading out to the desired thickness a mass of clay usually in the form of a cylinder prior to the flattening process.

According to the present practice, this "batting out" process or method of preparing the "bat" namely the slab or sheet of clay is performed by hand. The roll of clay is thrown on a plaster block and the presser or operator flattens the roll by pounding and slapping it with a tool of general circular form provided with a handle permitting the use of both hands in working the same, the "slapping" or "pounding" operation being gradually applied to the roll beginning at the center of the roll and working to the outer edge thereof as the roll or mass is gradually flattened out to the desired thickness. In this treatment, the plastic roll of clay, while being altered in its general form, is constantly pressed or forced together. As is well recognized in the art plastic clay can only be worked in this way, it must never be pulled or stretched.

The object of the present invention is to provide an improved mechanical batter or means for performing the batting out process in a manner analogous to the hand method without stretching or pulling the clay whereby the time and cost of manufacture of clay wares is materially reduced, and a more uniform product obtained.

A further object is to provide improved mechanical means for this purpose capable of being adjusted or set to produce bats or sheets of clay of definite predetermined and different thicknesses and shapes; to operate on rolls or masses of clay of varying sizes; and to vary or modify the pressing and forming action to suit clays of different degrees of plasticity.

The invention, with other objects and ad-

the several views, 1 designates an arm projecting laterally from a main vertical supporting post or standard 2 and carrying a tubular column 3, in which is arranged a vertical rod or shaft 4 on the lower end of which is mounted the clay pressing and forming member 5. The clay pressing and forming member 5 is of general bowl like or cup shaped formation and has a convex working face 6, shown in the drawings, as of general conical shape. A universal joint connection is provided between the lower end of the rod or shaft 4 and the member 5 centrally and at the upper side thereof, to permit of free oscillation or rocking movement of said member from side to side in different vertical planes about a circle. By preference, the universal joint connection is of the ball and socket type. In the drawings, the shaft 4 is shown provided at its lower end with a spherical head or ball 7 engaging a spherical socket 8 on the clay pressing and forming member, the socket 8 having parts 8', 8² secured in place by screws 8³ providing a readily detachable construction.

The clay pressing and forming member 5 is rocked or oscillated by a revolving and forwardly moving part bearing thereagainst. This revolving actuating part is shown, in the drawings, as an arm 9 provided with a roller 10, which engages a circular track 11 on the upper outer marginal portion of the pressing and forming member 5, the track 11 having curved side walls 11' and the roller 10 being formed with a transversely curved track engaging outer face 10'. The arm 9 is fixed to the lower end of a tubular spindle 12 surrounding the rod or shaft 4. Rotary motion is transmitted to the tubular spindle 12 through the medium of a beveled pinion 13 supported in a bearing 14 carried by an arm 15; which is secured to the standard 2. The tubular spindle 12 is free to slide longitudinally through a central opening in the pinion 13, the parts being coupled to rotate together by a key or feather 13' engaging a longitudinal slot 12' in the outer face of the spindle. The tubular spindle 12 and arm 9 are supported and moved longitudinally by a sleeve 16, which slidably fits between the tubular spindle 12 and the inner wall of the tubular column 3. The sleeve 16, which is held from rotation by a pin 17 engages a longitudinal slot 18 in the sleeve, is moved longitudinally by a worm pinion 19 supported for rotation in a bearing 20 on the tubular column 3 and meshing with a worm or thread 21 on the upper portion of the sleeve 16. When the sleeve 16 is fed downwardly, the lower end thereof will engage an anti-friction bearing 22 on a shoulder 23' of the tubular spindle 12 and advance the arm 9. When the sleeve 16 is retracted the upper end thereof

abuts against an annular collar 23 on the upper portion of the tubular spindle 12, the latter being carried upwardly with the sleeve.

The rod or shaft 4 on which the pressing and forming member 5 is mounted is given longitudinal movement by a rotary worm gear 24 supported in a bearing 25 on an arm 26. The rod or shaft has a squared upper part 4' engaging a squared socket 27 supported by an arm 28 to hold the same against rotation.

The tubular spindle 12 is adapted to be advanced or moved downwardly more rapidly than the rod or shaft 4. For this purpose the form pinion 19 and gear 20 are of greater pitch than the pitch of the worm pinion 24 and gear 25 of the rod or shaft 4. Independent drive connections are also provided for the pinions 19, 24 and beveled pinion 13, with clutches and change speed gearing, affording separate controls for the advance movement of the rod or shaft 4 and the sleeve 16, and the rotary movement of the tubular spindle 12, said drive connections and change speed gearing may be of any approved type, that illustrated in the drawings, Fig. 9, by way of example, including horizontal shafts 33, 34 and 35. On the inner ends of the shafts 33 and 35 are worms 30 31 meshing respectively with the worm pinions 19 and 24, and on the inner end of the shaft 35 is a beveled pinion 32 meshing with the beveled pinion 13. Along the outer portions of the shafts 33, 34 and 35 are counter-shafts 37, 38 and 39, and interposed between the shafts 33, 34 and 35 and the counter-shafts are frictional change speed gears A, B, C, D, D¹, D² designate clutches in the counter-shafts, the clutches and the frictional change speed gearing being of well known construction and only indicated in a general way. Belts 40, 41 and 42 engage pulleys 43, 44 and 45 on the counter-shafts 37, 38 and 39 and connect the same with a main drive pulley 46, which may be driven from any suitable source of power, for instance as shown, an electric motor 47.

35 designates the block or mould box positioned below the pressing and forming member and adapted to receive the roll of clay to be batted out, said box having the usual plaster lining 36 and being provided with a mold cavity 37 which is shown in the present instance, of a shape to form a foot for water closet fittings.

In the operation of the apparatus a roll or mass of clay having been placed upon the block or mold box 35 the tubular spindle 12 is rotated and fed forwardly, and the rod or shaft 4 is also advanced but more slowly than the tubular spindle, the pressing and forming member being oscillated or rocked from side to side continuously in different planes about a circle. The pressing and

forming member 5 constantly forces and presses the clay while spreading and flattening the roll, a constant pressure being applied approximately at the center of the mass and the same being gradually worked outwardly from the center, without pulling or stretching it, in substantially the same manner as in the hand method except that instead of the "slapping" or "pounding" treatment the "batting out" is effected by constant pressure.

By regulating and varying the forward movements of the rod or shaft 4 and the tubular spindle 12 relatively to each other the thickness of the "bat" or "slab" of clay produced may be varied. If the tubular spindle 12 is stopped at a point where the revolving arm and roller will force the pressing and forming member 5 below the horizontal plane of the apex or central lower part of the working face of the member, a bat or slab thicker at its center than at the edges will be produced, while if the arm 9 be controlled so that the outer marginal portion of the pressing and forming member is depressed less than the horizontal plane of the extreme lower central part thereof, a bat or slab thinner at the center than at the edge will be formed, variations in the thickness, extent of area, and shape of the bat or slab produced, over a wide range, may be obtained by varying the relative movement of the tubular spindle 12 and shaft 4, and also by modifying the shape of the working face of the pressing and forming member. When the advance movement of the arm 9 and the pressing and forming member 5 is such, that the latter is depressed at its marginal portion to a point in the horizontal plane of the extreme lower part or apex of the conical working face thereof, a perfectly flat bat will be produced.

It will be noted that the invention provides mechanical means of a very simple and effective nature that is capable of performing the batting out operation in a manner analogous to and possessing all of the advantages of the particular treatment of the laborious hand method, whereby the time and cost of production of clay wares is reduced to a considerable extent, and a more uniform product obtained. The apparatus also makes it possible to produce bats or sheets of definite predetermined and variable thicknesses and shapes, which, as will be appreciated, are features of considerable practical importance.

What I claim is:

1. An apparatus of the class described, including a clay pressing and forming member, and means for oscillating said member progressively in different vertical planes.

2. An apparatus of the class described, including a clay pressing and forming mem-

ber, means for feeding the member forwardly and for oscillating the same from side to side in different vertical planes.

3. An apparatus of the class described, including a clay pressing and forming member, means for moving the member forwardly and for simultaneously rocking the same progressively in different vertical planes.

4. An apparatus of the class described, including a clay pressing and forming member, means for oscillating said member progressively in vertical planes about a circle, and means for feeding the member forwardly at different speeds.

5. An apparatus of the class described, including a clay pressing and forming member, means for oscillating said member progressively in vertical planes about a circle, and automatic means for feeding the same forwardly.

6. An apparatus of the class described, including a clay pressing and forming member, means for oscillating said member progressively in vertical planes about a circle, and automatic means for feeding the member forwardly at different speeds.

7. An apparatus of the class described, including a clay pressing and forming member having a convex working face, and means for oscillating said member from side to side in different vertical planes.

8. An apparatus of the class described, including a clay pressing and forming member having a substantially conical working face, and means for oscillating said member from side to side in different vertical planes.

9. An apparatus of the class described, including a clay pressing and forming member, and means for rocking said member progressively in different vertical planes, said means including a circular track on the member and a revolving part engaging the track.

10. An apparatus of the class described, including a clay pressing and forming member, and actuating means for the member including a circular track on the member, a part engaging the track, and means for revolving said members and for feeding one of the members forwardly.

11. An apparatus of the class described, including a clay pressing and forming member, actuating means for the member including a circular track on the member, a part engaging the track, and means for simultaneously revolving and feeding said part forwardly.

12. An apparatus of the class described, including a clay pressing and forming member, capable of rocking movement in different vertical planes, a support for the member adjustable to advance the same, actuating means for the member including a circular track on the member, a revolving part

engaging the track, and means for adjusting said support to advance the clay pressing and forming member to advance said part at different rates of speed.

- 5 13. An apparatus of the class described, including a clay pressing and forming member of general bowl like formation, a vertical supporting rod for the member, a universal joint connection between the lower end of
10 said rod and the member centrally and at the upper side thereof, means for rocking the pressing and forming member in different vertical planes, said means including a circular track on the outer part of said member, an arm mounted for revolution and having a roller engaging the said track, and means for revolving the arm and feeding the same downwardly.

14. An apparatus of the class described, including a clay pressing and forming member of general bowl like formation, a vertical supporting rod for the member, a universal joint connection between the lower end of
20 said rod and the member centrally and at the upper side thereof, said support being vertically adjustable, means for adjusting the supporting rod to feed the pressing and forming member downwardly, means for rocking the pressing and forming member in
30 different vertical planes, said means including a circular track on the outer part of said member, an arm mounted for revolution and having a roller engaging the said track, and means for revolving the arm and feeding the same downwardly.

15. An apparatus of the class described, including a clay pressing and forming member having a convex working face, a support for the member, a universal joint connection
40 between the support and said member centrally thereof, and means for rocking the member progressively in different vertical planes about a circle.

16. An apparatus of the class described, including a clay pressing and forming member having a convex working face, a support for the member, a universal joint connection between the support and said member centrally thereof, and means for rocking the member progressively in different vertical
50 planes about a circle, said means including a circular track on the outer part of said member, an arm mounted for revolution and having a roller engaging the said track.

17. An apparatus of the class described, including a clay pressing and forming member having a convex working face, a support for the member, a universal joint connection between the support and said member centrally thereof, and means for rocking the member progressively in different vertical
60 planes about a circle, said means including a circular track on the outer part of said member, an arm mounted for revolution and having a roller engaging the said track, the circular track having curved side walls.

18. An apparatus of the class described, including a clay pressing and forming member having a convex working face, a support for the member, a universal joint connection
70 between the support and said member centrally thereof, and means for rocking the member progressively in different vertical planes about a circle, said means including a circular track on the outer part of said member, an arm mounted for revolution and having a roller engaging the said track, the circular track having curved side walls, and the roller having a transversely curved track engaging face.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

CHARLES H. MUCKENHIRN.

Witnesses:

GEORGE D. RILEY,

JAS. E. HUTCHINSON.