Jan. 4, 1927. 1,613,567

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BRICK FORMING MECHANISM

Filed June 10, 1924 3 Sheets-Sheet 1

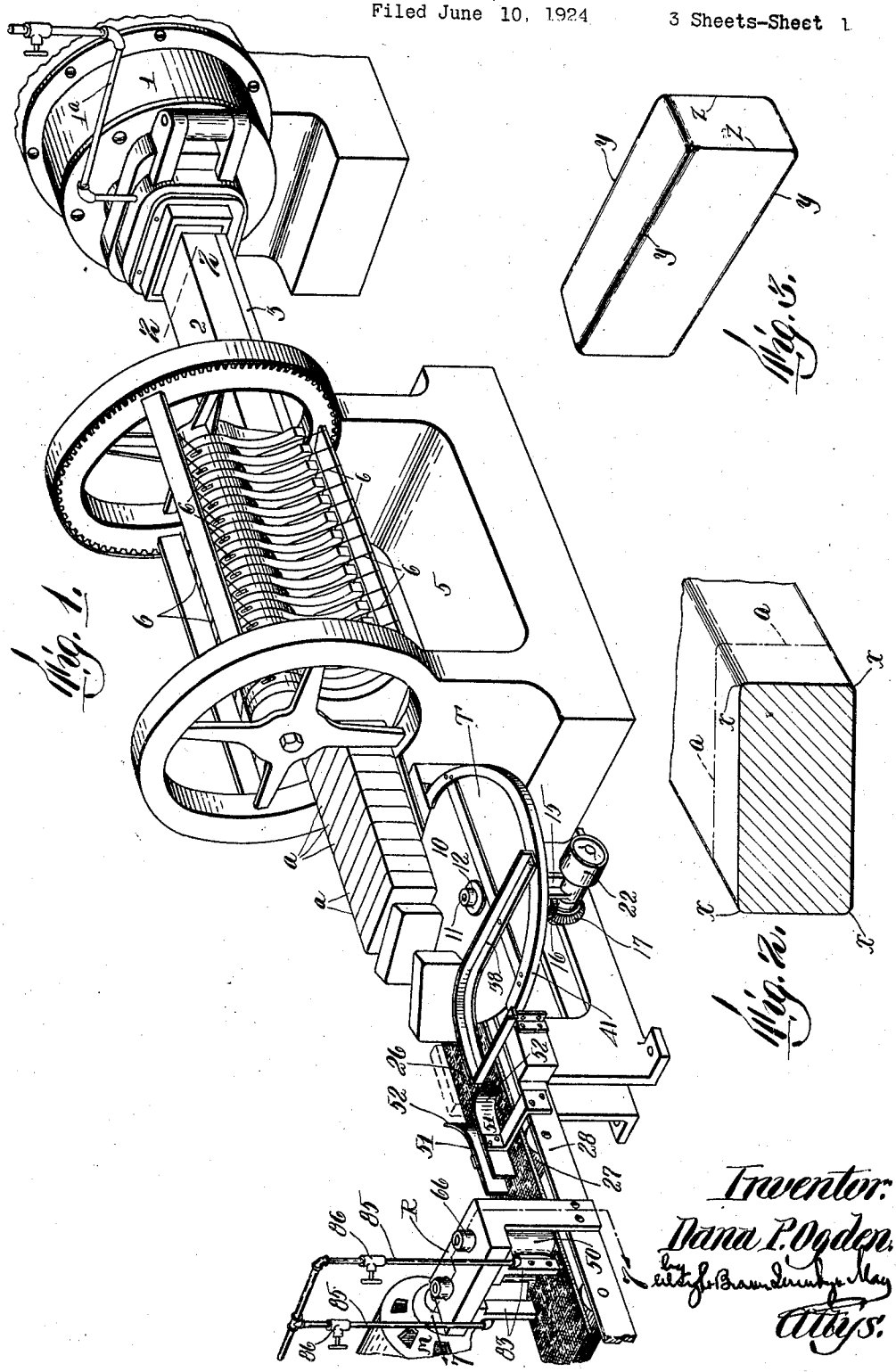


Fig. 1.

Fig. 3.

Fig. 2.

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BRICK FORMING MECHANISM

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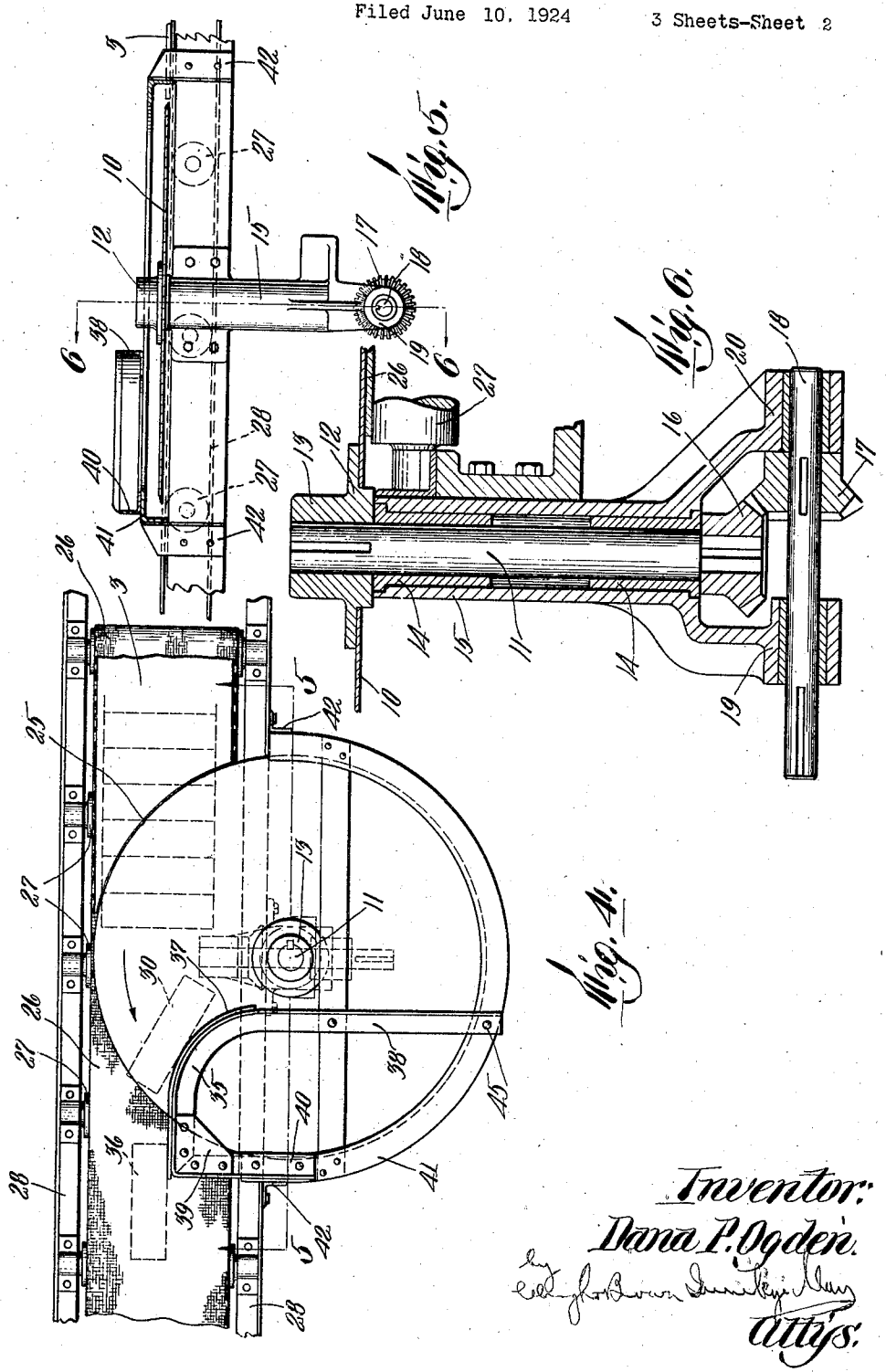


Fig. 5.

Fig. 6.

Fig. 4.

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BRICK FORMING MECHANISM

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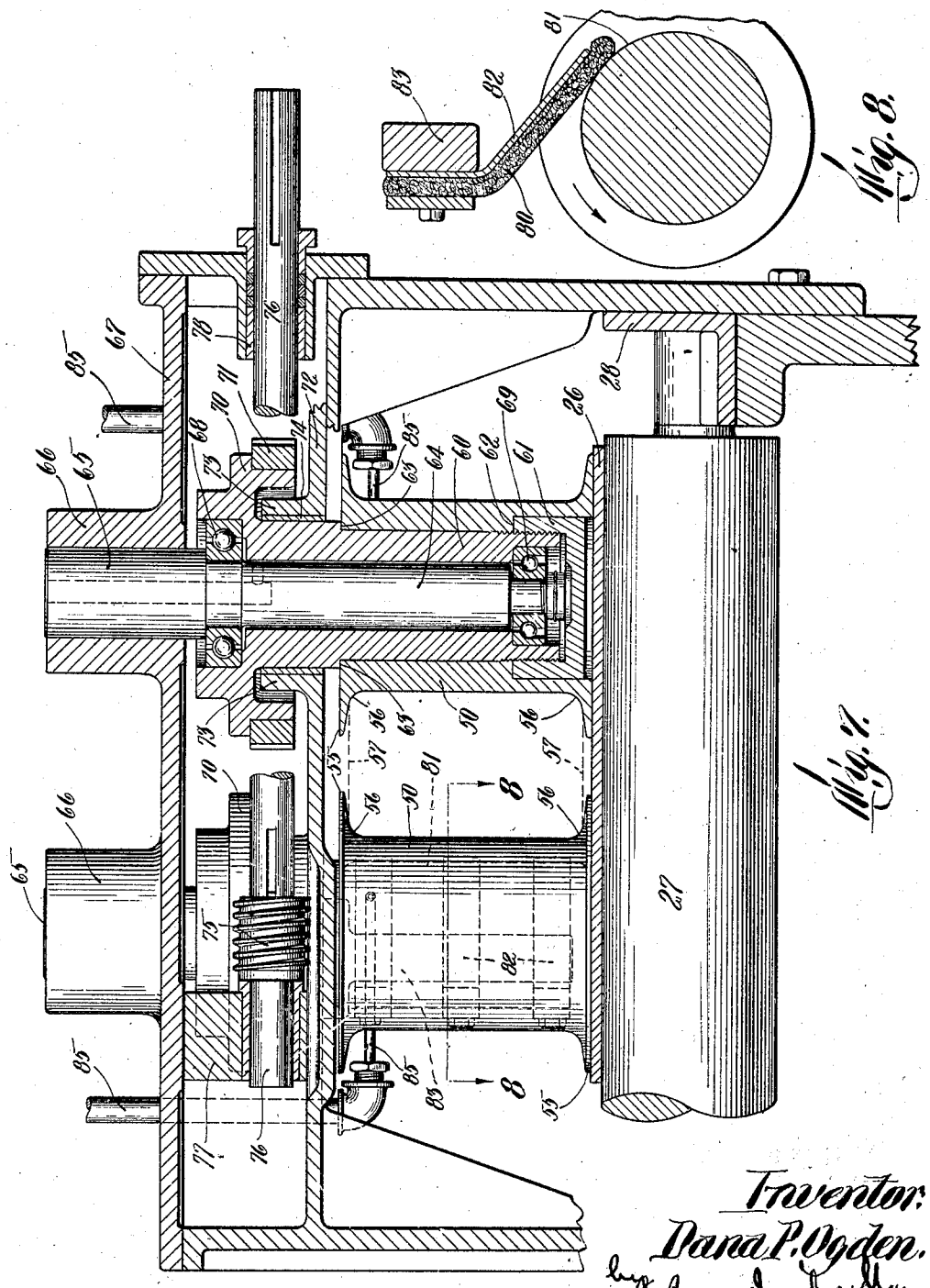


Fig. 8.

Fig. 7.

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Patented Jan. 4, 1927. 1,613,567

UNITED STATES PATENT OFFICE.

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BRICK-FORMING MECHANISM.

Application filed June 10, 1924. Serial No. 719,075.

This invention relates to the handling and shaping of plastic material, having been more particularly designed for handling and forming clay from the mass into bricks of the desired form having certain of their edges rounded.

One of the chief factors heretofore entering into the cost of making brick is the large amount of manual labor expended largely in handling and transporting the brick from one to a succeeding operation.

The present invention, therefore, provides mechanical handling and transporting mechanism by which the "green" or unburnt bricks are transferred from one operating mechanism to another and presented to each in the proper manner for the desired operation or operations to be performed thereon.

It is often desirable that certain of the edges of the bricks be rounded. This invention, therefore, provides mechanism by which these rounded edges may be produced, and mechanism for turning the bricks between successive mechanisms to present the bricks thereto in the proper manner so that the rounding operations may be reduced to comparatively simple actions and whereby the completely shaped bricks are left in relative positions facilitating their further handling for stacking preparatory to drying and burning.

For a more complete understanding of this invention reference may be had to the accompanying drawings in which—

Figure 1 represents in somewhat diagrammatic perspective the various operating and handling mechanisms concerned in the carrying out of this invention.

Figure 2 is a sectional perspective of a column of clay as issuing from the extruding die, the section being taken substantially on line 2—2 of Figure 1.

Figure 3 is a perspective of the completely shaped brick.

Figure 4 is a top plan of the turning mechanism.

Figure 5 is a vertical section on line 5—5 of Figure 4.

Figure 6 is a vertical detail section on line 6—6 of Figure 5.

Figure 7 is a section on line 7—7 of Figure 1 of an edge-rounding mechanism.

Figure 8 is a detail section on line 8—8 of Figure 7.

Referring first to Figure 1, at 1 is indicated a portion of the extruding mechanism comprising a die through which the clay in the plastic mass is extruded in the form of a column 2 having a cross section conforming to the front and rear faces of the bricks, as herein shown the cross section being rectangular. This mechanism may be of any suitable or usual character, its specific construction forming no part of this invention. Where a rectangular section is desired the die mechanism is preferably shaped to round off the edges of the column as shown at X in Figure 2.

The column is extruded on to a supporting platform 3 and preferably means are provided within the extruding mechanism for supplying a lubricant such as a mixture of castor oil and kerosene, a supply pipe 1^a being indicated for this purpose. This oil coats the surface of the column, though it does not penetrate into it, due to the water contained therein, and greatly facilitates sliding the column over the surface of the platform 3 toward a cutting off mechanism shown generally at 5. Details of this mechanism are also not concerned in the present invention, but as illustrated, the mechanism comprises a plurality of series of spaced wires 6, the spacing of these wires being that of the desired thickness of the bricks, the wires being brought down to cut through the column periodically to divide it into a plurality of brick sections along the lines *a* (Figures 1 and 2). The mechanism is also old in the art and requires no detailed description.

It is evident that the green bricks as severed from the column in this manner are not disturbed from their original position in the column and also that the edges formed by the severing operation are comparatively sharp. The bricks should be separated from each other so as to permit ready handling thereof for later operations and certain of the sharp edges formed by the cutting operation should be rounded over to conform to the requirements of the trade. For this purpose this invention provides a mechanism for separating the green bricks as cut from the column and for turning them so that they may be passed longitudinally through mechanism constructed to round off the longitudinal edges at the cut faces.

The turning mechanism at T shown in position relative to the cutting off mechanism

in Figure 1 is shown in detail in Figures 4 and 6. It comprises a rotary circular table 10 carried at the upper end of a shaft 11, as shown the table being fixed to the under face of a flange 12 of a collar 13 keyed to the upper end of the shaft 11. This shaft is mounted in bearing portions 14 at upper and lower ends of a sleeved standard 15, and below the lower bearing 14 a beveled gear 16 is fixed to the shaft 11.

Meshing therewith is a similar beveled gear 17 keyed to a transverse shaft 18 journaled in bearings 19 and 20 depending from the standard 15. The shaft 18 may be driven in any suitable manner, a belt pulley 22 being shown thereon in Figure 1. The table 10 at one side of its axis is adjacent to the end 25 of the platform 3 which is cut away on a curve to conform substantially to its periphery. Extending beneath the table and in substantially axial alinement with the platform 3 is a conveyor belt 26 supported by suitable rollers 27 journaled in side frame members 28 which may be formed as angle bars. The bricks as cut from the column are, therefore, adapted to pass over the end 25 of the platform on to the rotating table and from this table to be deposited on the upper face of the conveyor belt 26. The table is rotated at a rate such that the directional component of the velocity of its outer portion longitudinally of the belt and the platform where the table is engaged by the bricks is at least substantially equal to the speed of the bricks as supplied thereto, which is the rate at which the column is extruded from the die mechanism 1.

As the bricks are taken on to the table their rate of travel in this direction is increased due to the fact that the velocity of motion of the table longitudinally of the platform and conveyor at its diameter at right angles to the length of the platform and the belt is greater than the component in the same direction of points removed from this diameter. They are thus separated one from the other and are then turned somewhat, due to the angular motion of the table, this being shown by the dotted line position of a brick indicated at 30 in Figure 4. In order that these bricks may be properly handled by a succeeding edge-rounding mechanism, which will be later described, they should be turned so as to extend longitudinally with the travel of the belt conveyor 26. For this purpose a curved abutment shown at 35 has been provided with which the bricks engage when in partly turned position, as shown in Figure 3, the component of motion of the table longitudinally of the belt acting to push the brick along this abutment and over the edge of the table, which may be downwardly beveled to aid this action, on to the belt in substantial alinement therewith as shown in dotted lines at 36 in Figure 4. As shown this abutment comprises a curved plate 37 fixed to one leg of a correspondingly curved angle iron 38 extending over the table 10 and fixed at one end by means of a gusset plate 39 to a supporting angle 40 mounted on the upper flange of an angle 41 which partially encloses the outer edge of the table and is fixed to one of the guide members 28 by means of the vertical angle piece 42. The opposite end of the angle 38 also extends over the angle piece 41 and is fixed thereto as at 45. This mechanism, therefore, when the bricks impinge upon it acts to turn them at right angles to their former position, or lengthwise of their path of travel, and also to separate them one from the other so that turning may be effected without interference. The travel of the belt 26 should therefore be materially faster than the rate of extrusion of the column from the die 1.

The bricks are now in position to pass to the edge-rounding mechanism shown in detail in Figures 7 and 8 and somewhat diagrammatically at R in Figure 1. This mechanism comprises a pair of flanged rollers or spools 50 mounted to rotate about vertical axes and spaced apart a sufficient distance to permit the bricks to pass therebetween. In order to insure that the bricks shall be presented properly thereto, a pair of stationary guides 51 spaced to permit the bricks to pass therebetween and flared outwardly at their rear ends as at 52 may be positioned in advance of the rollers 50, the bricks passing therebetween and being properly alined thereby. The rollers or spools 50 have upper and lower flanges 55 provided with curved fillets 56 at their roots, these fillets being the active parts of the rollers and which round the edges of the bricks passing therebetween, the upper and lower faces of the bricks in relation to these rollers being shown by the upper and lower dotted lines 57 in Figure 7. The lower flanges of these rollers are positioned closely adjacent the upper surface of the belt 26 and act to raise the bricks slightly off of this belt as they pass therebetween.

Means is provided for rotating these rollers at a peripheral speed substantially equal to the rate of travel of the belt, if anything the rate being slightly slower than the rate of the belt. For this purpose the rollers are shown as carried at the lower ends of sleeves 60, being held frictionally thereon by means of caps 61 threaded on to the lower ends of these collars and engaging in counter-bored portions 62 in the rollers and pressing the rollers against annular shoulder portions 63 of the sleeve 60 formed by upper portions of larger diameter thereon. Each sleeve 60 is supported for rotation on a shaft 64 having its enlarged upper end 65 keyed in a

bors 66 in an upper frame member 67 of this mechanism. As shown the sleeve 60 is supported from this shaft by ball bearings 68 and 69 adjacent either end thereof and each sleeve 60 is also provided with an overhanging integral skirt 70 on which is fixed a ring 71 having worm teeth cut on the exterior thereof. A cross frame member 72 has a pair of upstanding sleeve portions 73 which extend within the skirt 70, these sleeve portions having bearing liners 74 within which the sleeve may rotate. The worm teeth on the rings 71 are engaged by worms 75 keyed to a horizontal shaft 76 journaled in bearing members 77 and 78 in the machine frame by turning of which it is evident that the rollers 50 may be rotated in opposite directions at the desired surface velocities. In Figure 1 a motor M is shown for driving the shaft 76.

In order that the bricks may pass between these rollers and be formed thereby with smooth rounded edges, it is preferable to lubricate the rollers. This may be done by means of pads 80 having their ends 81 bearing against the faces of these rollers and being pressed thereagainst by means of spring arms 82, the pads and spring arms being fixed at their opposite edges to a support 83 extending parallel to the axis of these rollers, and as shown in Figure 1, depending from the upper frame member of this mechanism. To these pads is supplied a lubricant which may comprise a mixture of kerosene and castor oil, through the pipes 85 which may have control valves 86 therein and be connected to a pressure lubricating system of which the lubricating pipe for the die mechanism 1 may form a part. It will be noted that the rollers are rotated against the edges of the pads as this is found to give the best results. Passing between the rollers 50 in this manner the longitudinal edges Y, as shown in Figure 3, are progressively molded by the fillets of the rollers and are thus rounded over, these edges being at the cut faces produced by the action of the wires 6 of the cutting off mechanism. If desired, also, the surfaces of the rollers might be of any other desired configuration or be provided with marks in cameo or intaglio with which it might be desired to mark the bricks. The edges Z of the brick (Figure 3) are not required by the trade to be rounded and are therefore left in the condition in which they are formed by the cutting off mechanism. The bricks are now in condition to be dried and burned.

Having thus described an embodiment of this invention it should be evident to those skilled in the art that various changes and modifications might be made therein without departing from its spirit or scope as defined by the appended claims.

I claim:

1. In a machine of the class described, means for forming a column of plastic material, means for cutting said column into lengths, and means for progressively molding certain of the edges of the lengths at the cut faces.

2. In a machine of the class described, means for extruding a column of plastic material, means for cutting said column into lengths, and means acting to move each cut length clear of the column and then to turn said length through an angle of approximately 90°.

3. In a machine of the class described, means for cutting a column of plastic material into lengths, and means acting to move each cut length clear of the column and then to turn said length through an angle of approximately 90°.

4. In a machine of the class described, means for extruding a column of plastic material, means for cutting said column into lengths, means for separating said lengths, and means for progressively molding certain of the edges of said lengths at the cut faces.

5. In a machine of the class described, means for forming a column of plastic material, means for cutting said column into lengths, means acting to move each cut length clear of the column and then to turn said length through an angle of approximately 90°, and means for rounding certain of the edges of each said length at its cut faces.

6. The method of shaping bricks which comprises extruding a column of plastic brick-forming material of a cross section corresponding to a side face of the bricks, cutting said column into sections equal to the desired thickness of the bricks, and progressively molding certain of the edges of the bricks at the cut faces.

7. The method of shaping bricks which comprises extruding a column of plastic brick-forming material of a cross section corresponding to a side face of the bricks, cutting said column into sections equal to the desired thickness of the bricks, and progressively molding the longitudinal edges of the bricks at the cut faces.

8. The method of shaping bricks which comprises extruding a column of plastic brick-forming material of a cross section corresponding to a side face of the desired bricks, cutting said column into sections equal to the desired thickness of the bricks, and passing said sections endwise between forming members shaped to mold progressively certain edges at the cut faces.

9. The method of shaping bricks which comprises extruding a column of plastic brick-forming material of a cross section corresponding to a side face of the desired

bricks, cutting said column into sections equal to the desired thickness of the bricks, and passing said sections endwise between forming members shaped to mold progressively longitudinal edges at the cut faces.

10. In a machine of the class described, a rotary table, means for delivering articles thereto whereby they are turned angularly by rotation of said table, and means for receiving and taking away the articles from said table after they have been turned to a predetermined extent.

11. In a machine of the class described, a rotary table, means for depositing a succession of articles on said table adjacent to its outer edge to be separated from each other and turned angularly by the rotation of said table, a stationary guide against which said articles engage to insure the turning of the artices to a predetermined extent, and means for conducting the articles so turned away from said table.

12. In a machine of the class described, a rotary table, a platform leading to said table and over which articles may be moved on to said table, a fixed guide against which the articles moved by said table impinge to cause said articles to assume a desired position different from that on said platform, and a traveling belt having a portion positioned beneath said table to receive the articles therefrom and carry them away.

13. In a machine of the class described, a platform, a conveyor in substantially axial alinement with said platform, and a rotary table journaled at one side of and projecting over said conveyor and in the same plane with the adjacent end of said platform which conforms substantially to the periphery thereof.

14. In a machine of the class described, a platform, a conveyor in substantially axial alinement with said platform, a rotary table journaled at one side of and projecting over said conveyor and in the same plane with the adjacent end of said platform which conforms substantially to the periphery thereof, and a stationary guide over said table and against which articles carried thereby from said platform impinge and are turned to positions substantially at right angles to those occupied on said platform, said guide also acting to direct articles so turned on to said conveyor to be moved thereon from said table.

15. In a machine of the class described, a platform, a conveyor in substantial alinement with said platform, and means interposed between said platform and conveyor acting to increase the spacing between articles moved thereto over the upper face of said platform, to turn the articles to a desired extent angularly, and to deposit the articles on to said conveyor.

16. In a machine of the class described, a platform, a conveyor in substantial alinement with said platform, means interposed between said platform and conveyor for receiving articles from the platform, turning them to a desired angular extent, and then depositing them on said conveyor, and means for driving said receiving and turning means to increase the spacing of the articles as turned.

17. In combination, means for conveying a succession of plastic bricks, and molding means acting on said bricks as conveyed to round off certain of the edges thereof.

18. In combination, a conveyor, means for positioning green bricks longitudinally on said conveyor, and rollers for rounding the longitudinal edges of said bricks as they are being conveyed.

19. In combination, a pair of spaced rollers, means for feeding green bricks end on between said rollers, gears on said rollers, a shaft having worms mounted thereon meshing with said gears to turn the rollers in opposite direction, and means for rotating said shaft.

20. The combination with a conveyor on which plastic articles may be placed to be carried thereby, of rollers to the nip of which said articles are passed by said conveyor, said rollers being adapted to roll said articles between them, and to modify the contours thereof.

21. In combination with a conveyor on which green bricks may be supported and moved, a pair of members between which said bricks are moved by said conveyor, said members being shaped to round all the longitudinal edges of the bricks passed therebetween.

22. The combination with a conveyor on which green bricks may be supported and moved, of a pair of rollers to the nip of which said bricks are moved by said conveyor, said rollers acting to round all the longitudinal edges of the bricks rolled therebetween.

23. In combination, a conveyor on which green bricks may be supported arranged endwise, and a pair of flanged rollers having fillets at the bases of said flanges and being spaced to permit the bricks to be passed therebetween, said fillets acting to round the longitudinal edges of said bricks.

24. In combination, a conveyor on which green bricks may be supported arranged endwise, a pair of flanged rollers having fillets at the bases of said flanges and being spaced to permit the bricks to be passed therebetween, said fillets acting to round the longitudinal edges of said bricks, and means for supplying a lubricant to the peripheries of said rollers.

25. In combination, a conveyor on which green bricks may be supported arranged endwise, a pair of flanged rollers having

fillets at the bases of said flanges and being spaced to permit the bricks to be passed therebetween, said fillets acting to round the longitudinal edges of said bricks, and means for rotating said rollers.

26. In combination, a conveyor on which green bricks may be supported arranged endwise, a pair of flanged rollers having fillets at the bases of said flanges and being spaced to permit the bricks to be passed therebetween, said fillets acting to round the longitudinal edges of said bricks, and pads pressed against the peripheries of said rollers, means for rotating said rollers, and means for supplying lubricant to said pads.

27. The method of shaping bricks, which comprises extruding a column of plastic brick-forming material of a cross section corresponding to a side face of the bricks, cutting said column into sections equal to the desired thickness of the bricks, and progressively molding the longitudinal edges of the bricks into rounded form.

28. A step in the method of shaping bricks, which comprises progressively molding the longitudinal edges of the green brick into rounded form.

29. The method of rounding certain of the edges of green bricks which comprises passing the bricks between flanged rollers having fillets at the bases of said flanges to contact with the edges to be rounded, and rotating said rollers in the direction of the passage of said bricks and at substantially the same surface velocity.

30. The method of rounding certain of the edges of green bricks which comprises rolling said bricks between a pair of spaced rollers having rounded surface portions with which said edges are contacted.

31. In a machine of the class described, a supporting plate over which a column of plastic articles may be moved, the forward end of said plate terminating along a line diagonal to the line of progression of said column, and a conveyor in line with said plate and moving in the direction of progression of said column and at a faster rate to receive the articles as they pass over the diagonal end of said plate, the upper face of said conveyor being at a higher level than the upper face of said plate closely adjacent to said diagonal end.

In testimony whereof I have affixed my signature.

DANA P. OGDEN.