May 14, 1940. R. M. FLORES 2,200,270

APPARATUS FOR MAKING TILES FROM CLAY PRODUCTS

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Fig. 1.

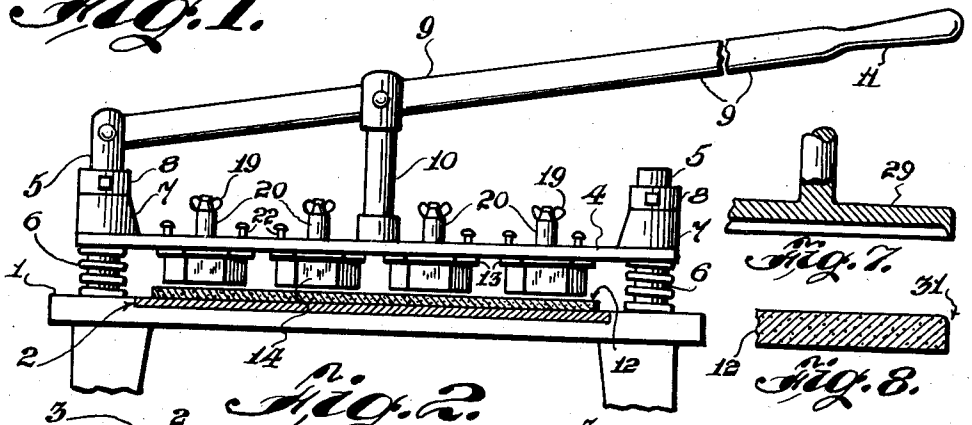


Fig. 2.

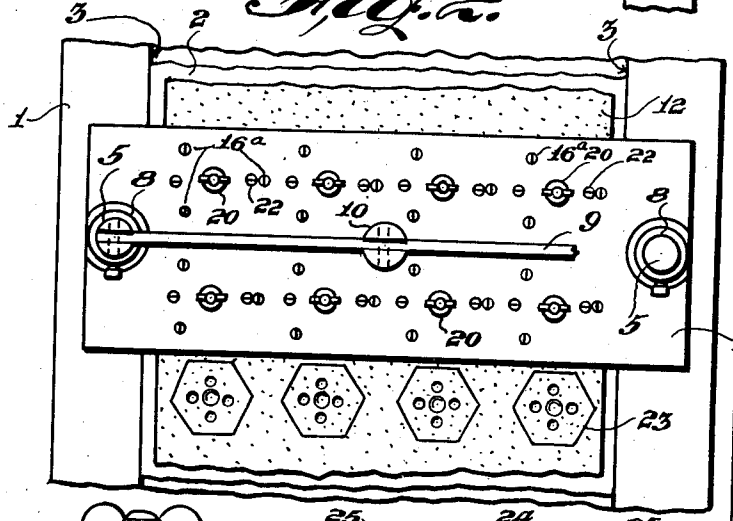


Fig. 4.

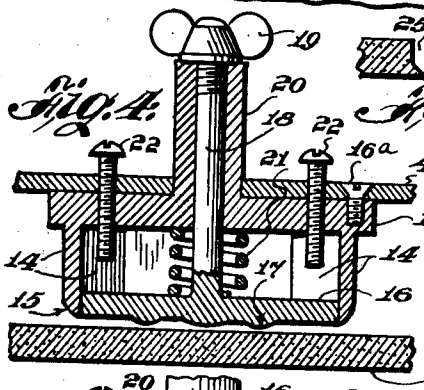


Fig. 5.

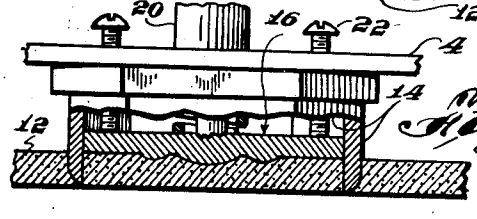


Fig. 6.

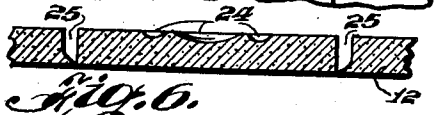


Fig. 3.

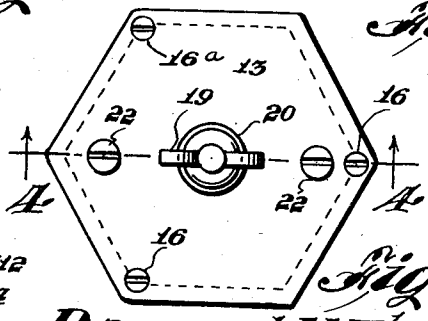


Fig. 7.

Fig. 8.

Fig. 9.

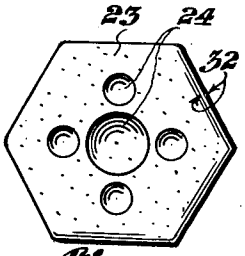
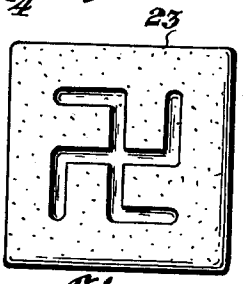


Fig. 10.



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APPARATUS FOR MAKING TILES FROM CLAY PRODUCTS

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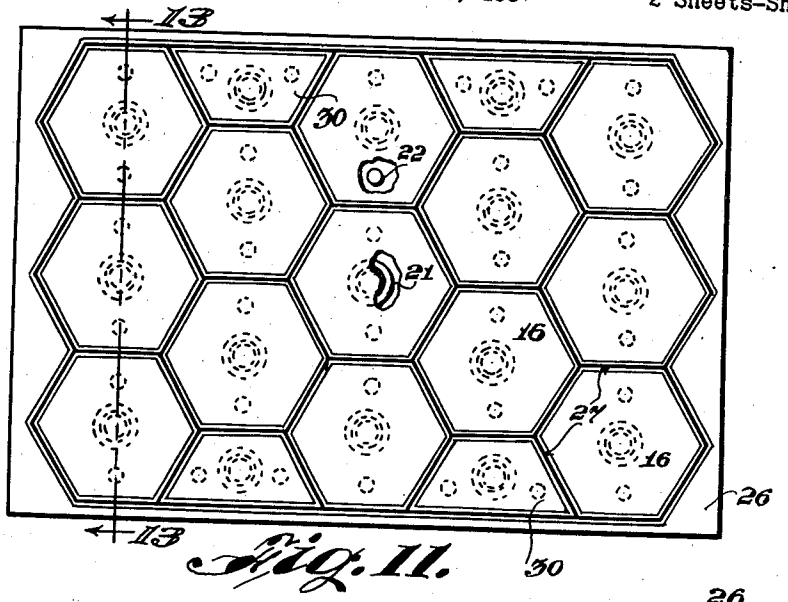


Fig. 11.

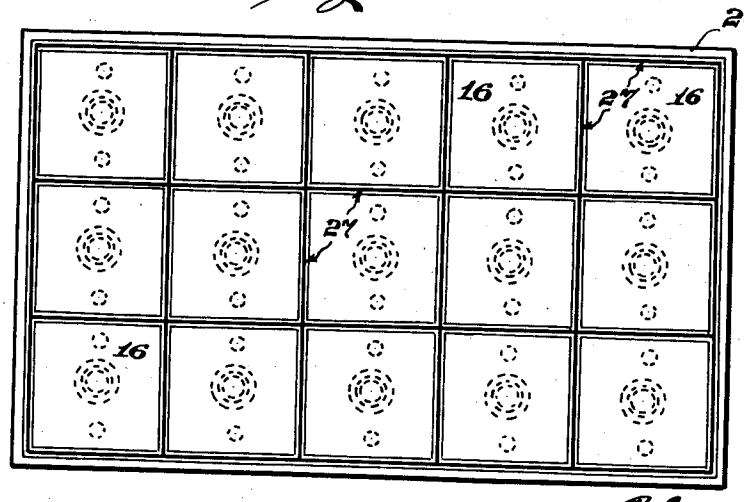


Fig. 12.

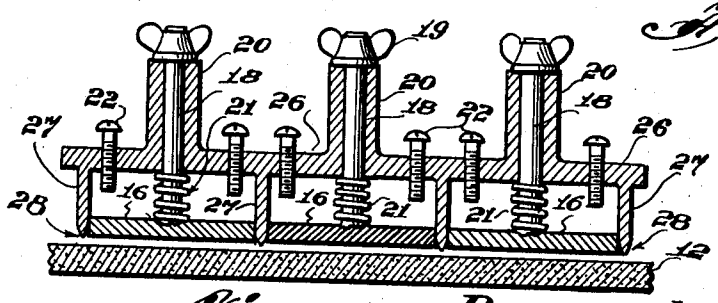


Fig. 13.

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Patented May 14, 1940 2,200,270

UNITED STATES PATENT OFFICE

2,200,270

APPARATUS FOR MAKING TILES FROM CLAY PRODUCTS

Raymond M. Flores, Mineral Wells, Tex., assignor of one-half to H. E. Ellis, Mineral Wells, Tex.

Application November 29, 1937, Serial No. 176,960

4 Claims. (Cl. 25—105)

This invention relates to the production of floor tiles, wall tiles and other clay products, and the primary object of the invention is to provide an apparatus for making the above products in a minimum of time and labor, and without any special skill on the part of the operator.

Preliminary to a clear understanding of the invention, it may be stated that floor and wall tiles have been and are now being made which have all the requisites of a well turned out product, with round corners, beveled edges and sides, etc., the result of a hand-made tile and including any desired design or imprint. This process of producing such clay tiles and wall tiles is, however, slow and to mould tiles in this manner the operator must have considerable experience, and the product is comparatively high in price.

In the invention submitted for consideration and on which a patent is sought there is provided a device or apparatus comprising the combination of a die-cut press, a tile moulder, a tile cutter and trimmer and also a design printer means, and with the combined arrangement of parts most any person without any previous experience in this art may mould and produce any desired kind of floor or wall tiles, more beautifully and with a greater rapidity than the most skilled moulder in the ceramic art. Further, with the device hereinafter described in detail, clay products of shapes that heretofore could only be made in plaster of Paris moulds can be produced as rapidly as a slab making machine can produce slabs of clay.

In the drawings hereunto annexed and made a part of this specification are illustrated a form of device or apparatus designed to bring about the objects heretofore referred to, and in said drawings:

Figure 1 is a side elevational view of the invention, partly in section, and partly in broken formation,

Figure 2 is a plan view of Figure 1, the operating lever being broken away,

Figure 3 is an enlarged plan view of one of the units embodied in the assembly shown in Figures 1 and 2,

Figure 4 is a cross-sectional view of Figure 3, the view being had on the line 4—4 of said figure,

Figure 5 is a view similar to Figure 4, showing one of the units in a clay cutting and stamping or imprint position on a slab of clay,

Figure 6 represents a sectional view of a portion of a clay slab after being cut and stamped by one of the units,

Figure 7 is a sectional detail view of a trimmer for producing beveled or rounded edges of the product and Figure 8 is a fragmentary detail view of a piece of tile, showing the result of the trimming,

Figures 9 and 10 are plan views, respectively, of two shapes and designs, illustrative of the designs and shapes which may be formed by the device,

Figures 11 and 12 are bottom views, respectively, of an assembly of the units in close relation where the tiles are cut en masse, Fig. 11 showing the half tiles which are produced thereby when a hexagonal or similar form is desired, and

Figure 13 is a cross-sectional view of Figure 11.

In carrying out the invention and in order to provide a maximum production of the previously described tiles with the device, a moving slab of clay of any desired thickness must first be obtained. This can very easily be done by means of one of the many different types of brick machines now in use. In the drawings and as illustrated in Figures 1 and 2, a support or table 1 is provided, the table having a wide groove between the points 3—3, and in the groove is a metal inlay 2, lubricated with oil, on which the slab of clay will slide. A plate of material, preferably rectangular in shape, as indicated at 4, is mounted on posts 5, this plate having openings at each end so that the plate may move loosely on the posts. On each post are also mounted springs 6, the plate resting on the springs. Members 7 are placed on the top end portion of the assembly plate 4 or made a part of the plate and a collar 8, with set screw as shown, is provided for each post to make proper adjustments. The springs 6 are for keeping the assembly plate up in a normal position. The plate 4 carries the assembly of tile moulding and stamping units, such as are illustrated in Figures 3, 4 and 5, and pressure is applied to the plate by means of a lever 9, pivotally connected to one of the posts 5 by pin as shown. A post 10 is also mounted on the upper side of the plate 4 and pivotally connected to the lever 9. Thus when the handle portion 11 of the lever is brought downwardly until the lever bears upon the end of the post to the right in the drawings, the assembly plate 4 is pressed against the springs 6, the arrangement providing a yieldable and guiding descent of the plate carrying the units whereby the latter are forced into the clay slab, shown at 12.

Each of the cutting and stamping units embodies a hollow die having a top 13 and sides 14, the sides having beveled cutting edges 15. The

top of each unit is fastened to the assembly plate 4 by the screws 16a, the units being spaced from one another. Each of the units provides a cutting and printing arrangement embodied in the sides 14 and the plate 16. As depicted in Figures 4 and 5, the plate 16 has an embossed design of the desired shape or form as indicated at 17, and a rod or post 18 with a winged nut 19 is provided for the purpose of adjusting and guiding the printing plate 16 up and down. To properly guide the plate 16 as it is moved upwardly and downwardly between the sides 14, when cutting through the clay slab 12, the top of the unit as at 13 projects into a tubular member 20, and between the underside of the top and plate 16 is a spring 21. The purpose of this spring is to push down plate 16 to remove the tile from the cutting edges of the sides 14 of the mould when assembly plate 4 is moving upwardly. Set screws 22 are stops for the purpose of limiting the inward sliding movement of the plate 16. Adjustment of these screws will be made in accordance with the thickness of the slab from which the tile is cut. In Figures 4 and 5 are shown the positions one of the units takes in cutting and stamping or imprinting a tile 23 such as are shown in Figures 9 and 10. In Figure 4 the unit is in its upper position ready to be pressed downwardly upon the clay slab 12, and in Figure 5 the embossed plate 16 has been moved sufficiently upon the surface of the slab to produce the design and to simultaneously cut, press and trim the clay tile from the slab, with the result as shown in Figure 6, the imprint and cuts, respectively, being indicated at 24 and 25.

Figures 11, 12 and 13 represent another form of assembling the units in close relation, and in this arrangement the tops of each unit are united in one piece of material as at 26, and the sides 27, similar to the sides 14, previously described, form a dividing wall or sides with the sharpened edges 28 for cutting the slab 12.

The beveled edges and rounded corners of the tile are made by the plate 29, resulting in the corners 31 and the edges 32.

In the operation of the device, the slab of clay 12 is made to move underneath the units, traveling on the lubricated plate 2. The desired plate pressure for the printing of the design is set to proper adjustment, and the lever 9 operated to press the assembly of units into the slab 12, after which the resulting tiles are trimmed. The downward movement of the plates 4 and 26 compress the tile to be cut and the plate 16 prints the design thereon as previously described. Where the tile is to be plain with no design, the material is compressed to a flat surface. On the upward movement of the plate 4 or the plate 26, the impression or compression plates 16, being under pressure of the springs 21, force the tile cut from the cutting edges of the sides. In Figures 11, 12 and 13 are shown an assembly of units closely related, and previously described, and in Figure 11 the half tiles necessary in the formation and cutting of tiles are indicated at 30, at the edges of the plate 26.

While there is disclosed a practical working embodiment of the apparatus embodying the invention, it is to be understood that changes and alterations are possible therein, in keeping with the intent of the invention, such modifications being within the scope and meaning of the appended claims.

What is claimed as new is:

1. A cutting unit for tile forming, comprising a hollow die having one end open, a plate slidable within said die, a center post projecting from said plate, means at the other end of the die for guiding said post, means normally forcing said plate toward the open end of said die, means on said post limiting said movement, and adjustable stop means mounted in said die in position to contact a portion of said plate spaced from the post upon movement of the plate away from the open end of the die to limit said last mentioned movement.

2. A cutting unit for tile forming, comprising a hollow die open at one end and closed at the other, a plate slidable axially within said die and conforming substantially to the size and shape of the interior thereof, a post extending centrally from said plate and slidable through the closed end of said die, a nut threaded on the outer end of said post and engageable with said die, an expansion spring encircling said post and interposed between said plate and the closed end of said die, and stop screws threaded through said closed end of the die to limit the travel of said plate inwardly from said open end.

3. A cutting unit for tile forming, comprising a hollow die having one end open, a plate slidable within said die, a center post projecting from said plate, means at the other end of the die for guiding said post, means normally forcing said plate toward the open end of said die, means on said post limiting said movement, adjustable stop means mounted in said die in position to contact a portion of said plate spaced from the post upon movement of the plate away from the open end of the die to limit said last mentioned movement, and said plate having a continuous fin projecting from the edge thereof in the direction of the open end of said plate and rounding into the body of said plate.

4. A cutting unit for tile forming, comprising a hollow die open at one end and closed at its opposite end, a tubular portion extending centrally and outwardly from the closed end of said die, a post slidably arranged within said tubular portion, a plate secured to that end of said post within the die, an expansion spring encircling said post and bearing against said plate and the closed end of said die, a nut threaded upon the outer end of said post and engageable with said tubular portion, and screws threaded through the closed end of said die and projecting into the latter to limit the travel of the plate inwardly from the open end thereof.

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