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APPARATUS FOR MANUFACTURING TILES.

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Fig. 1.

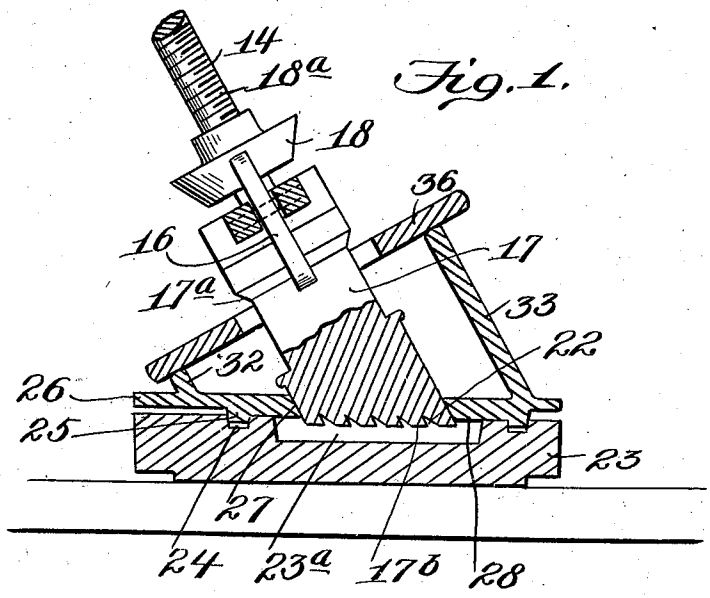


Fig. 3.

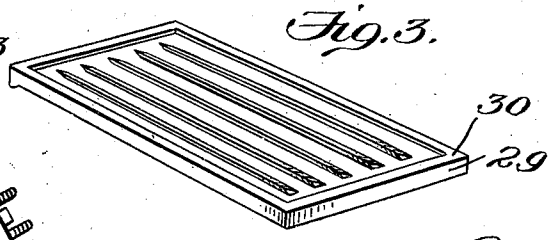


Fig. 2.

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APPARATUS FOR MANUFACTURING TILES.

No. 859,906. Specification of Letters Patent. Patented July 9, 1907.

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To all whom it may concern:

Be it known that we, JOSEPH R. MILLER, of Morgantown, county of Monongalia, State of West Virginia, and ULYSSES S. HUGGINS, of Weston, county of Lewis, State of West Virginia, citizens of the United States, have invented new and useful Improvements in Apparatus for Manufacturing Tiles, of which the following is a specification.

This invention relates to an apparatus for manufacturing tiles having one face formed with under-cut projections which constitute clenchers for retaining the tile in the position set; and the object thereof is to provide a machine of such class in a manner as hereinafter set forth to enable the completing of the tile at one operation, thereby overcoming the necessity of grinding smoothly the ends and sides of the tile after the under-cut projections have been formed, as is the case in machines for manufacturing tiles now in general use. This completing of the tile at one operation facilitates the manufacture thereof, increases the output and decreases the cost of the article for the reason that it overcomes the necessity of grinding the sides and ends of the tile, such operation incurring time, labor and expense.

With the foregoing and other objects in view the invention consists of the novel construction, combination and arrangement of parts hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In describing an apparatus for manufacturing tiles in accordance with this invention, reference is had to the accompanying drawings, wherein like reference characters denote corresponding parts throughout the several views and in which—

Figure 1 is a sectional elevation of the mold and plunger or die of the apparatus; Fig. 2 is a side elevation of the apparatus; Fig. 3 is a perspective view of the completed article.

Referring to the drawings, 1 denotes a plurality of supports for a table top 2. The supports may be mounted, if desired, upon suitable rollers so that the machine can be transported from one point to another. The rollers are not shown for the reason that such mounting of the supports is obvious and is usually employed in machines of the class to which this invention relates. Each side of the table top (only one side thereof is shown) is formed with a depending portion 3 which constitute hangers or bearings for the supporting shaft 4, the latter being journaled in the depending portions 3. The shaft 4 on each end thereof carries a shifting disk 5 (only one shown) which, when oscillated, is adapted to operate the apparatus. The operating handle 6 is provided and is connected at its lower end, as at 6^a, to one of the disks 5.

The apparatus further comprises a reciprocatory cross-head 7 sliding upon the inclined guide rods 8, (only one of which is shown). There is a guide rod arranged at each side of the table and at its lower end is secured to a segment-shaped member 9 loosely mounted upon the shaft 4. Carried by the segment-shaped member 9 is a pair of headed adjusting bolts 10 having screw-threaded ends upon which are mounted the clamping nuts 11. The bolts 10 are adapted to extend through and are shiftable within a segment-shaped slot 12 formed in the depending extension 3. The members 9 are adjustable upon the shaft 4 so as to enable the positioning of the guide rods 8 at any desirable inclination, and as the cross-head 7 is connected to the guide rods 8 it will also be shifted in unison with said rods. When the nuts 11 are released the segment-shaped members 10 can be moved towards the front or to the rear of the table and when the desired adjustment has been obtained, the members 9 are clamped in such position by screwing home the nuts 11.

To the cross-head 7, through the medium of the clamping nuts 13, is secured a die or plunger carrier 14. The latter is also attached to a transversely-extending guide rod 15 which slides upon the inclined guide rods 8, suitable openings being provided in the ends of the rod 15 to allow of the mounting of the same upon the rods 8. Pivoted to the guide rod 15 is a pair of coupling dogs 16 (only one of which is shown). The function of the dogs is to couple the die or plunger 17 to the carrier 14 when the said dogs are moved to coupling position. The dogs 16 are moved to coupling position by a shiftable and interiorly-threaded collar 18 having a beveled periphery and which is mounted upon the screw-threaded portion 18^a of the carrier 14. By moving the member 18 downwardly it will cause the upper ends of the dogs 16 to move outwardly, the inner ends to move inwardly and engage over the beveled shoulders 17^a of the die or plunger 17 so that the latter will be coupled to the carrier and by such construction it is evident that when the cross-head 7 is reciprocated, a like movement will be imparted to the carrier 14 and plunger 17, the cross-head, carrier and plunger moving in unison, the cross-head sliding upon the rods 8, the rod 15 also being reciprocated simultaneously with the cross-head owing to the fact that it is connected to the carrier 14.

The cross-head 7 is reciprocated through the medium of a pair of links 19 (only one is shown), which are pivotally connected at the upper ends to the cross-head 7, as at 20, and at the lower ends to the disks 5, as at 21. From such an arrangement a reciprocatory movement will be imparted to the cross-head 7 when the disks 5 are oscillated in both directions.

The die or plunger 17 is positioned at an inclination, but has a flat working surface 17^b, and such face is provided with a series of elongated notches 22, which extend at an angle with respect to the working face 17^b, one wall of each of the notches extending at a greater inclination than the other wall thereof, so that when the die or plunger 17 is brought against the material within the mold 23, a series of inclined or uncut projections or ribs will be formed in one face of the tile.

The reference character 23 denotes the mold which is mounted upon the table top 2. The receiving portion of the mold for the material is indicated by the reference character 23^a and the top of the mold body is provided with a groove 24 to receive the offset 25 depending from the lower face of the guide plate 26. The latter is formed with a centrally-arranged opening with the walls thereof, as at 27, inclined at the same angle in which the plunger or die 17 extends. The opening in the guide plate 26 is such that the walls 27 thereof will fit the plunger snugly, but will not be too tight to retard the operation of the plunger. The opening through the guide plate 26 is of such diameter with respect to the receiving portion 23^a of the mold as to cause the plate to over-hang the top of said receiving portion, as at 28, consequently such over-hanging portion will form the tile 29 when completed with a smooth marginal portion 30 extending entirely around the inner face thereof. Supported upon the plate 26 through the medium of the inclined supports 32, 33, (the latter being of less height than the former,) is an auxiliary guide plate 36 through which the plunger or die 17 passes. The supports 32, 33 may be formed integral with the auxiliary guide plate 24, as well as the main guide plate 26, or may be connected with the two plates in any other suitable manner.

The providing of the coupling dogs 16 affords means whereby the plunger can be detachably connected to the carrier. Such arrangement allows for the connecting to the carrier of plungers having their working faces provided with notches of varying inclinations, so as to enable the changing of the angle of the undercut projections which are to be formed in the tile. The guide plate 26 is also removable so that other guide plates with the walls of the opening at varying inclinations can be employed so that the necessary guide plate to fit the inclination or angle through which the plunger or die 17 extends can be readily set up, thereby obtaining a satisfactory operation of the die or plunger.

The interchangeability of the guide plates, dies or plungers enables the forming of projections or ribs on the inner face of the tile 29 at various inclinations so that the apparatus is not limited to the manufacture of tiles provided with ribs or projections extending at but one angle. The adjustability of the guide rods 8 also provides means so that said rods can extend at the angle in which the plunger extends.

The walls of the receiving portion of the mold may be fluted or provided with any suitable configuration so that the tile, which is completed at one operation, will be ornamented or formed with spacing projections.

It is evident that the apparatus as hereinbefore set forth, provides a machine whereby a tile is completed at one operation and overcomes the necessity of grinding off the sides and ends of the tile after the under-cut projections are formed, as is the case with machines now in general use. The overcoming of the necessity of grinding off the tile decreases the cost of manufacture of the article, as well as vastly increasing the output without additional expense.

Although the apparatus is especially designed for the manufacture of glass tiles, yet it is to be understood that the apparatus is thoroughly applicable for the manufacture of tiles of any suitable plastic material.

What we claim is—

1. An apparatus of the class referred to, embodying a reciprocatory cross-head adjustable to various inclinations, and a plunger connected with the cross-head and extending at the same inclination and having a flat working face provided with a plurality of elongated notches extending at an angle with respect to the said working face.

2. An apparatus of the character described, comprising the combination with a mold, of a plunger extending at an inclination and having a flat working face provided with angularly-disposed notches, a reciprocatory cross-head for operating the plunger, and means for adjusting said cross-head at an inclination to position it with respect to the direction of inclination in which the plunger extends.

3. A machine for manufacturing tiles comprising interchangeable plungers each extending at a different inclination, interchangeable guide plates provided with an opening with the walls of one opening in one guide plate extending at a different inclination with respect to the inclination in which the walls of the openings of the other guide plates extend, the inclinations of the walls of the openings in the guide plates conforming to the angle in which the plungers extend, a reciprocatory cross-head adapted to be detachably connected to the plungers, guide rods for the cross-head, means for angularly adjusting the guide rods and cross-head to position them at the same angle in which a plunger extends, and means connected with the cross-head for reciprocating it.

4. An apparatus of the character described comprising a mold, an inclined plunger operating therein and having a flat working face provided with angularly disposed notches for forming in connection with the mold a tile with undercut projections, a cross-head extending at an inclination and connected with the plunger for operating it, and means connected to the cross-head for reciprocating it.

5. An apparatus for forming tiles comprising the combination with a mold and a guide mounted thereon and over-hanging the receiving portion of the mold, of an inclined plunger extending through said guide and having a flat working face provided with notches, and an angularly adjustable means for operating the plunger.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JOSEPH R. MILLER.
ULYSSES S. HUGGINS.

Witnesses:
M. A. DAVIS,
CHAS. P. SWINT.