United States Patent

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[54] HOLLOW BRICK MOLD BOX

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[73] Assignee: **Wienerberger Ziegelfabriks-Und Baugesellschaft**

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[52] **U.S. Cl.** **425/431**

[51] **Int. Cl.** **B28b 7/00**

[58] **Field of Search** ..... 25/41 T

[56] **References Cited**

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Assistant Examiner—Ben D. Tobor
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[57] **ABSTRACT**

Hollow bricks are molded about cores supported by core bars in a mold box. The moldable material in the box is compacted by a pair of vertically movable compaction tools. The core bars are of beveled cross section to form respective vertically extending camming surfaces tapering upwardly and downwardly, and each core bar is centered between the compaction tools of each pair of tools, with one of the camming surfaces facing a respective tool during vertical movement of the tools adjacent the bar. Springs normally reciprocate the tools of each pair towards each other, the camming surfaces being arranged first to reciprocate the tools apart as the tools vertically move downwardly into contact with the camming surfaces and, upon further downward movement, to permit reciprocation towards each other by the action of the springs.

5 Claims, 6 Drawing Figures

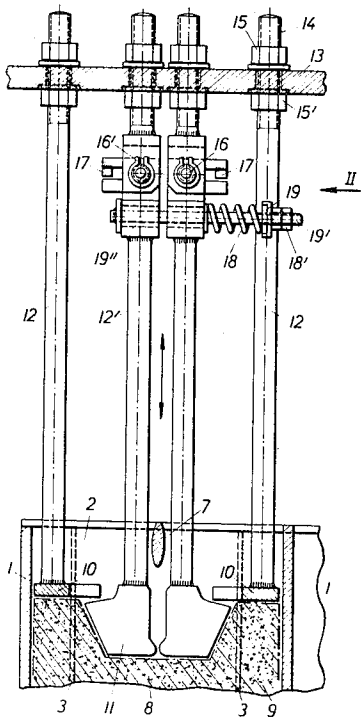


FIG. 1

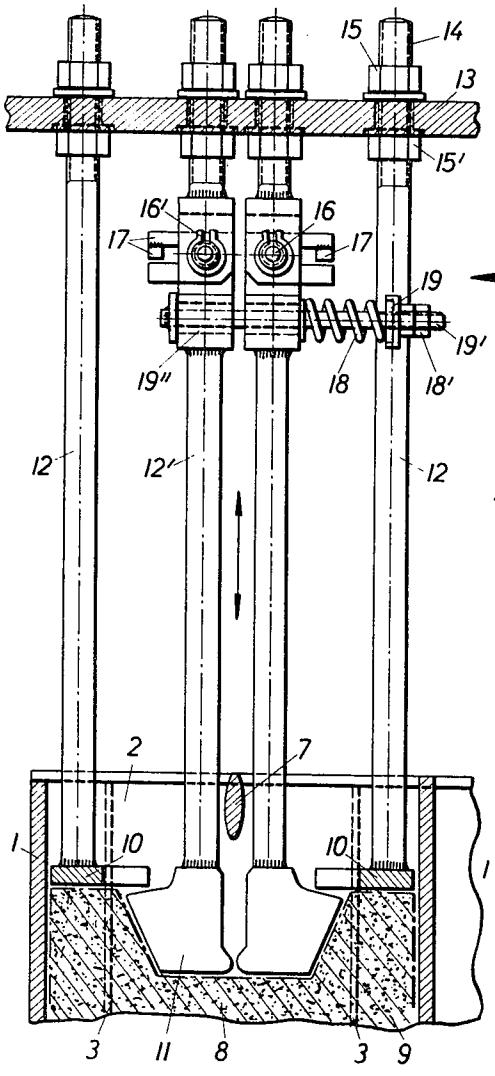


FIG. 2

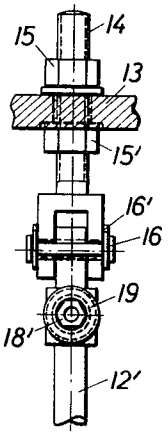


FIG. 3

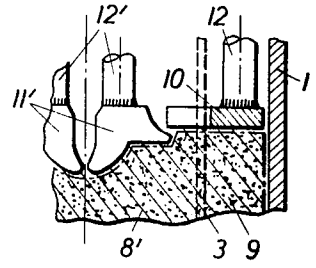


FIG. 4

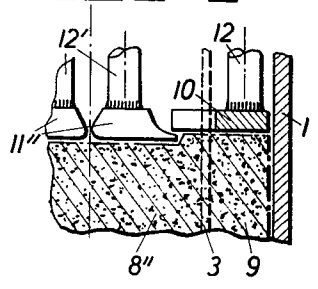


FIG. 5

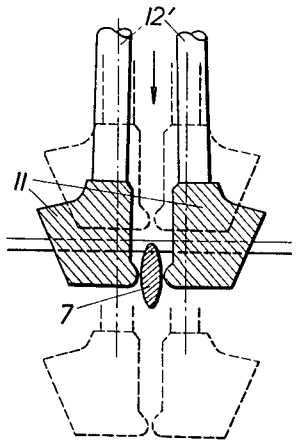
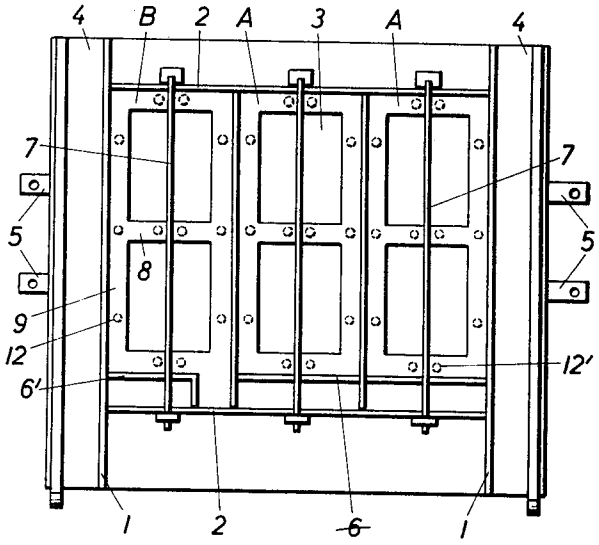


FIG. 6



HOLLOW BRICK MOLD BOX

The present invention relates to a hollow brick molding machine of the type including a mold box containing cores supported by core bars extending across the top of the mold box. The mold box is formed by front, rear and end liners, the mold box liners and the cores defining a molding chamber whereinto moldable material may be poured for molding hollow bricks about the cores. A pair of vertically movable compaction tools are mounted for compacting surface areas of the moldable material in the mold box upon vertical movement of the compaction tools into engagement with the surface areas.

In conventional mold boxes of this type, the compaction tools adjacent the core bars had to be spaced a certain distance from each other to permit them to bypass the bars during the vertical movement of the tools. Although the bars could be made of relatively narrow cross section to reduce the space between the compaction tools, some space inevitably remained between the tools leaving a gap where no compaction was effected. Thus, the surface zone of the molded brick below the core bars was insufficiently compacted, causing cracks to occur even during storage or curing and thus adversely affecting the quality and strength of the molded bricks.

It is the primary object of the invention to eliminate this deficiency and to provide a mold box for molding hollow bricks of high quality and uniform stability wherein all surface areas, including those underneath the core bars are uniformly compacted.

This object is accomplished in accordance with the present invention with core bars of beveled cross section to form respective vertically extending camming surfaces. Each core bar is centered between the compaction tools of each pair of tools, with one of the camming surfaces facing a respective one of the compaction tools during vertical movement of the tools adjacent the bar. Biasing means normally reciprocate the compaction tools of each pair towards each other, the camming surfaces being arranged first to reciprocate the tools apart as the tools vertically move downwardly into contact with the camming surfaces and, upon further downward movement, to permit reciprocation towards each other by the action of the biasing means.

The above and other features of the invention will be better understood by reference to the attached drawing showing certain embodiments of the invention, and wherein

FIG. 1 shows a side view of the compaction tools, with portions of the tool support and mold box in cross section;

FIG. 2 is a partial end view of FIG. 1 in the direction of arrow II;

FIGS. 3 and 4 are detailed views showing modified shapes of the compaction tools;

FIG. 5 illustrates successive stages in the downward movement of the compaction tools of FIG. 1; and

FIG. 6 is a top view of a mold box comprising several mold compartments.

Referring now to the drawing, the mold box is shown to comprise front and rear liners 1, 1 and end liners 2, 2, a plurality of mold cores 3 being positioned in the box to form cavities in the bricks to be molded in the box. As shown in FIG. 6, a pair of rails 4, 4 are affixed to the top edge of rear and front liners 1 of the box, and a feed pan (not shown) may be moved along the rails to supply moldable material through the open top of the mold box, a series of such mold boxes being placed side-by-side along the rails, if desired.

As also shown in FIG. 6, lugs 5 projecting from the support framework of the mold box enable the entire apparatus to be gripped and lifted for transport to different locations.

Furthermore, it will be seen from this figure that hollow bricks of different shapes may be molded in the mold box, bricks A being of rectangular cross section while brick B has a front extension for making wall portion adjacent to doors or windows, for instance. For this purpose, special dividing plates 6 and 6' are inserted in the mold box, according to the desired shapes of the bricks to be molded.

The mold cores 3 are secured by conventional means, not shown for clarity's sake, to core bars 7 extending across the top of the mold box parallel to liners 1, 1 approximately centrally of the respective cores and the end faces 8 of the hollow bricks, the rear and front faces 9 of each brick defining a cavity therein with its end faces.

A pair of compaction tools 10, 11 is mounted laterally adjacent each core bar 7, which tools are vertically adjustable and may also be vibratory, as is well known, for application to the surface of the moldable material in the mold box, the tools being positioned between cores 3 and the mold box liners 1 and 2. In this manner, tools 10 will compact the front and rear walls 9 of the bricks (see FIG. 1) while tools 11 will compact the end walls 8 thereof.

The compaction tools 11 are shaped partially to conform to those portions of compaction tools 10 facing them so that the conforming portions of the tools cooperate to engage substantially the entire surface of brick end walls 8. Furthermore, the tools 11 are shaped to mold the desired surface configuration of brick walls 8. Thus, tools 11 are shaped to produce a recess of trapezoidal cross section in brick wall 8, as seen in FIG. 1. In the modification of FIG. 3, the tools 11' are shaped to mold a stepped recess having a bottom of arcuate cross section in the surface of the brick wall 8'. The tools 11'' of FIG. 4 mold a flat, shallow depression into the surface of the brick wall 8''. It will thus be obvious that any desired surface configuration may be imparted to the brick walls by correspondingly shaping the compaction tools.

The compaction tools 11, 11', 11'' are secured to the ends of plungers 12' while compaction tools 10 are secured to the ends of plungers 12, the plungers being suspended from vertically movable carrier plate 13. The upper ends 14 of the plungers are passed through corresponding bores in the carrier plate and are threadedly secured by nuts 15, 15' on the plate.

While plungers 12 are rigid, each plunger 12' is articulated about pivot pin 16 for pivotal movement of the compaction tool secured thereto in the direction of front and rear walls 9 of the hollow brick, i.e., in a fore-and-aft direction in respect of the mold box. In the illustrated embodiment, split rings 16' hold the pivot assembly in place.

A pair of stops 17, 17 limit the pivotal movement of the plungers 12', compression springs 18 being mounted normally to bias the plungers 12', 12' against each other so that the compaction tools 11, 11', 11'' face each other adjacent the core bar 7.

Spring 18 is mounted between plunger 12' and an abutment plate 19, the spring being coiled about bolt 19' passing through the abutment plate. A nut 18' threadedly engages the outer end of the bolt so that movement of the nut 18' in relation to the bolt 19' adjusts the bias of spring 18.

FIG. 5 illustrates the successive stages of the operation of the compaction tools during the vertical movement thereof. As shown, the core bar 7 is of beveled cross section, forming respective camming surfaces projecting ledges of the compaction tools. Thus, as the tools descend the camming surfaces of the core bar will first move the tools apart and, as the tools continue to slide over the camming surfaces of bar 7, they will automatically permit them to move together again under the bias of spring 18.

While the invention has been described and illustrated in connection with certain preferred embodiments, variations and modifications thereof will readily occur to those skilled in the art without departing from the scope of this invention, as defined in the appended claims.

I claim:

1. In a hollow brick molding machine of the type including a mold box containing cores supported by core bars extending across the top of the mold box, the mold box being formed by front, rear, and end liners, the mold box liners and the cores defining a molding chamber whereinto moldable material may be poured for molding hollow bricks, and a pair of vertically movably compaction tools for compacting surface areas of the moldable material in the mold box upon vertical movement of

the compaction tools into engagement with said surface areas, wherein the improvement comprises was inserted:

1. the core bars being of beveled cross section to form respective vertically extending camming surfaces tapering upwardly and downwardly,
2. each core bar being centered between the compaction tools of each pair of tools, with one of the camming surfaces facing a respective one of the compaction tools during vertical movement of the tools adjacent the bar, and,
3. biasing means for normally, biasing the compaction tools of each pair towards each other,
   a. the camming surfaces being arranged first to reciprocate the tools apart as the tools vertically move downwardly into contact with the camming surfaces and, upon further downward movement, to permit reciprocation towards each other by the action of the biasing means.

2. In the hollow brick molding machine of claim **1**, the compaction tools having beveled ledges for contact with the camming surfaces.

3. In the hollow brick molding machine of claim **1**, means for pivotally mounting the compaction tools about a pivoting axis extending in the direction of the core bar with which the tools are associated.

4. In the hollow brick molding machine of claim **1**, further comprising an additional pair of vertically movable compaction tools, the additional compaction tools being held rigid in respect of the reciprocable compaction tools, and one of each of the rigid compaction tools cooperating with a respective one of the reciprocable compaction tools for compacting substantially the entire surface area of the moldable material in the mold box.

5. In the hollow brick molding machine of claim **4**, each rigid compaction tool overlapping the cooperating reciprocal compaction tool, the reciprocal compaction tool being recessed to receive the overlapping portion of the rigid compaction tool.

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