Jan. 13, 1942. A. H. SEXTON 2,269,557

APPARATUS FOR REMOVING TILE FROM MOLDS

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FIG. 1.

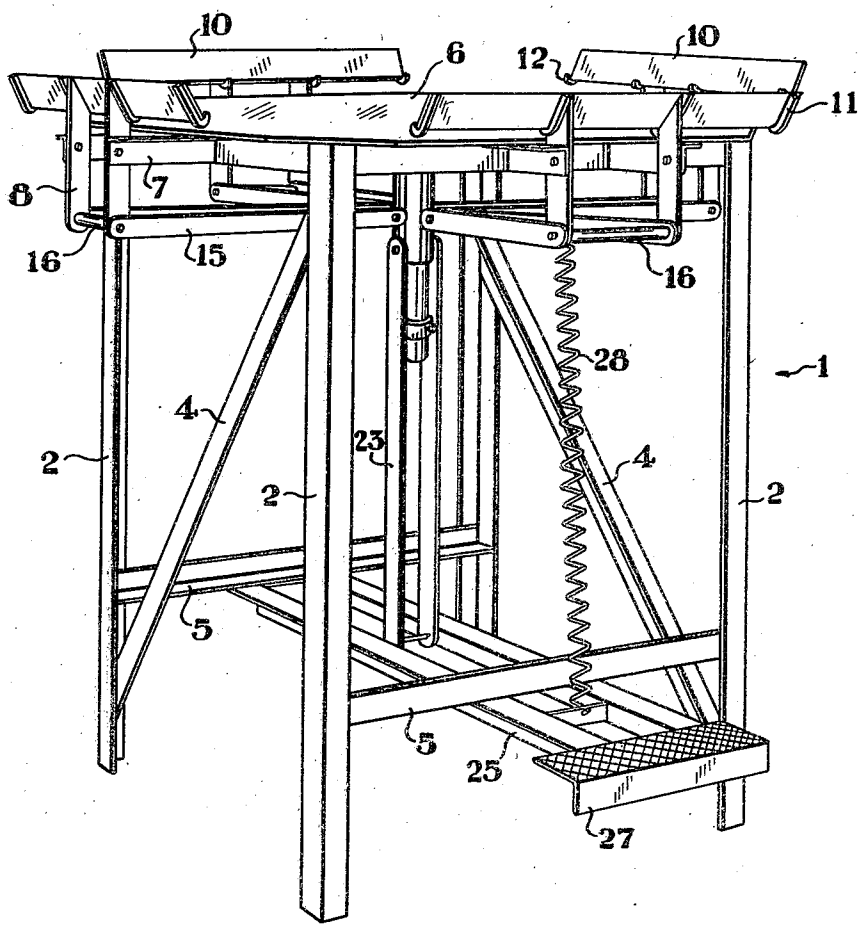

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FIG. 2.

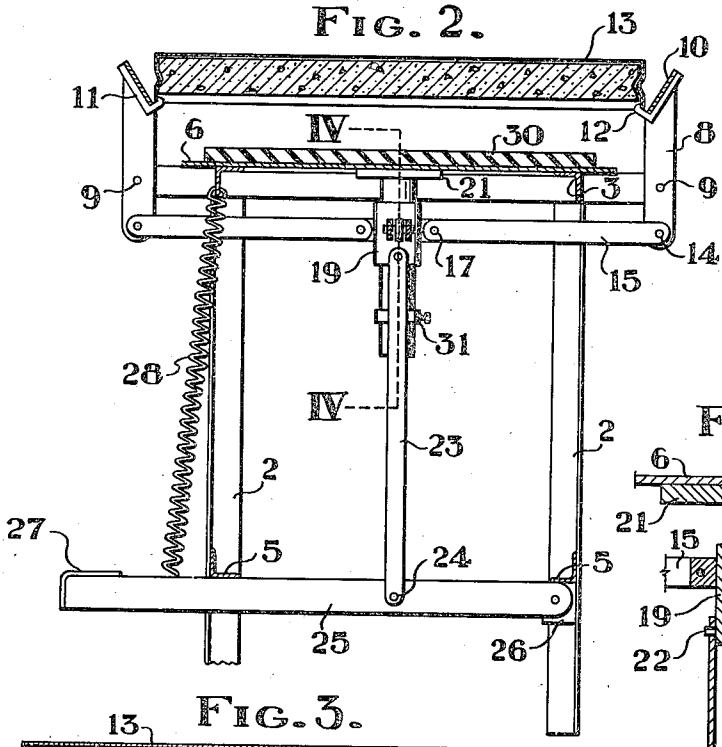


FIG. 4.

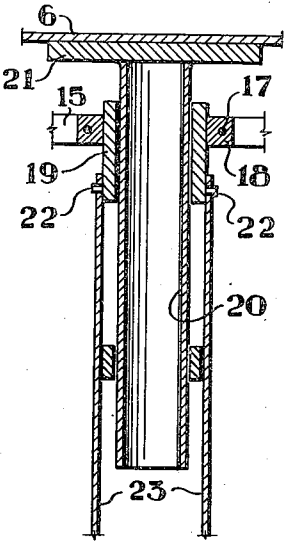
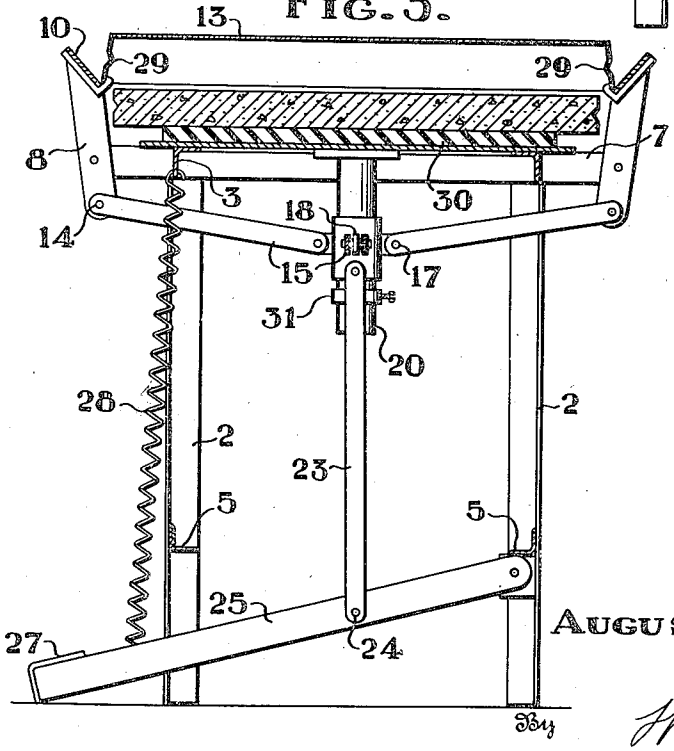


FIG. 3.



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Patented Jan. 13, 1942

2,269,557

UNITED STATES PATENT OFFICE

2,269,557

APPARATUS FOR REMOVING TILE FROM MOLDS

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Application June 24, 1940, Serial No. 342,021

7 Claims. (Cl. 25—1)

This invention relates to the formation of building panels from moldable materials and is particularly directed to the provision of a device which may be employed to quickly and easily remove large building panels from the forming molds.

In the manufacture of building panels such as, for example, cementitious tiles, it has been found desirable to provide the tiles with recessed side surfaces to insure a firm bond between the tile and the mortar used in laying the same. To form the tile, sheet metal molds are employed, each of these molds having a bottom wall and a plurality of side wall sections which are not connected at the ends. The molds are clamped or otherwise held with the ends of the side wall sections in abutting relationship and the cementitious mixture placed therein. After the mixture has hardened, the mold may be inverted and the side walls spread slightly to release the formed tile. When the recesses are to be provided in the tiles, the side wall sections of the molds have inwardly projecting ribs and consequently the tiles will not be as readily released therefrom.

The primary object of this invention resides in the formation of a machine which will be particularly adaptable for use in removing tiles having recessed sides from the molds therefor, the machine also being equally suitable for removing tile having plain side surfaces from the forming molds.

Another object resides in the provision of a machine of the character mentioned which will have a tile receiving surface and a plurality of mold engaging hooks supported for movement at the sides thereof, the mold with the tile therein being inverted and positioned with the upper edges of the side walls in engagement with the hooks, the machine being provided with means for moving the hooks to spread the side walls a sufficient amount to permit the tile to pass the inwardly projecting ribs and drop onto the receiving surface.

A further object resides in providing a machine for releasing tile from molds which is characterized by having a framework provided with an elevated table above which mold engaging hooks project, the lower portion of the framework having an interconnected lever system which may be actuated by the operator's foot to cause movement of the hooks and the side walls of the mold positioned thereon in the operation of releasing a tile from the mold.

It is also an object to provide the machine with flexible means for yieldably resisting the separation of the mold engaging hooks and returning the various movable parts of the machine to original positions upon release of the operating power after the building panel has been removed from the mold.

A more complete understanding of the invention may be acquired by reference to the following description and the accompanying drawings, wherein apparatus of the type above mentioned has been illustrated in detail.

In the drawings:

Fig. 1 is a perspective view of a tile removing unit formed in accordance with the present invention;

Fig. 2 is a vertical sectional view taken through the unit shown in Fig. 1 with a mold having a tile positioned therein on the mold engaging hooks prior to the release of the tile;

Fig. 3 is a similar view with the operating elements of the machine in a position to release the tile;

Fig. 4 is a detail vertical sectional view taken on the plane indicated by the line IV—IV of Fig. 2.

In carrying out the invention, especially when large tile are removed from the forming molds, a tile removing unit of the type illustrated in the drawings is employed. This unit includes a frame 1 having corner legs 2 formed from sections of structural steel of angular cross section. The legs are in spaced vertical positions and are connected at their upper ends with a rectangular frame 3, also formed of angle members. Diagonal braces 4 extend between the leg members at each side of the frame and horizontal braces 5 extend between the legs at the front and rear sides. A substantially rectangular table top 6 is secured in any suitable manner to the frame 3, the corners of the table top being removed to permit the operator to readily grasp the tiles to remove them from the unit after separation from the mold.

At each side of the frame 3, bracket members 7 project laterally in spaced relation, these members serving as supports for vertical arm members 8 which are pivotally connected by pins 9 to the outer portions of the braskets. The arms 8 are arranged in pairs and at the upper ends of each pair, a strip 10 is supported in horizontal position, the strip being welded or otherwise secured to the upper ends of the arms. Where the arms connect to the strips, the end edges are beveled in order that the strips will incline toward the center portion of the table

at the lower edges. Mold engaging hooks 11 are secured to the strips 10 at longitudinally spaced points, the hooks being secured to the outer surfaces of the strips and having their lower hook-shaped ends 12 beneath the strips 10 and projecting inwardly beyond the lower edges of the strips. These hooks, as illustrated in Fig. 2, engage the free edges of the side sections of a tile forming mold 13 when the mold is inverted and arranged over the unit.

The lower ends of the arms 8 have openings for the reception of rods 14 which serve to pivotally connect link members 15 to the arms. Sleeve members 16 surround the bars 14 between the arms 8 to maintain spaced relation. The links 15 are normally disposed in a substantially horizontal plane and extend inwardly toward the central portion of the unit, the inner ends of the links being connected by pivots 17 to lugs 18 carried by a sleeve-like crosshead 19. This member is mounted for vertical sliding movement on a tubular guide 20 which is connected to the under side of the table top 6 by a plate 21. These members may be connected by any suitable means, welding being preferable for convenience in manufacture and the elimination of bolt heads or other obstructions on the upper surface of the table top.

Below the lugs 18, the crosshead has a pair of registering projections 22, to which the upper ends of a second set of link members 23 are pivotally secured. These members have their lower ends pivotally connected as at 24 to the intermediate portion of a foot lever 25 formed from a pair of spaced angle bars and pivotally connected at one end to bracket members 26 depending from the transversely extending angle 5 at the rear of the frame. The forward end of the foot lever projects a considerable distance beyond the angle member 5 at the front of the machine and is provided with a treadle 27 for engagement by the foot of the operator.

Normally, the lever 25 is held in an elevated position in engagement with the brace 5 at the front of the unit by a tension-type coil spring 28. The brace 5 serves as a stop to limit upward movement of the foot lever. The spring 28 holds the crosshead 19 in elevated position wherein the links 15 will be horizontally disposed and the maximum distance between the lower ends of the arm members 8 maintained.

This position of the arm members will place the hooks 12 in a position to receive the edges of an inverted mold when it is held over the table top and lowered a sufficient distance. After the mold has been positioned on the hooks as illustrated in Fig. 2, the operator may place his foot on the treadle 27 and move the lever to the position shown in Fig. 3. This movement will cause the crosshead to move downwardly onto the guide 20 and the links 15 will assume an inclined position. Since the links are formed of rigid material, the distance between the outer ends of opposed link members will be decreased, thus drawing the lower ends of the arm members at opposite sides of the table toward one another. This motion results in the spreading or separation of the upper ends of the arm members and since the hooks move therewith, the side wall sections of the mold will be separated. If the arm members move a sufficient distance to cause inwardly directly ribs 29 on the side wall sections of the mold to be completely withdrawn from the grooves formed thereby in the side walls of the tile, the latter member will be released and permitted to drop onto the table top.

To avoid injuring the tile, a resilient pallet 30 is placed on the upper surface of the table top. After the tile has been released, the pressure on the foot lever may be released and the operating parts of the mechanism permitted to return to original positions. At this time, the mold may be removed from the hooks 12 and the workmen may remove the tile from the table top. The foregoing operation may be repeated as many times as desired, depending, of course, upon the number of tiles being manufactured. The downward movement of the crosshead is limited by a collar 31 adjustably positioned on the lower portion of the guide 20.

It is obvious that the unit illustrated in the drawings will be effective in separating tile having grooves in the side wall from the forming molds having the inwardly directed ribs in the side walls. It is also obvious that the unit may be employed whether or not the particular form of mold illustrated is used in forming the tile.

While the invention has been illustrated in its preferred form, many minor changes may be made in the construction and relation of parts without departing from the spirit and scope of the invention as set forth in the following claims.

What is claimed is:

1. Apparatus for removing building tile from forming molds comprising a table-like support, arm members pivotally supported adjacent the sides of said support for movement about horizontally disposed axes, mold engaging hooks carried by said arms above said support, a guide carried by said support, a crosshead supported for movement on said guide, a foot lever mounted for pivotal movement on said support, and link means connecting said crosshead, said foot lever and said arm members.

2. A structure as specified in claim 1 in combination with means for yieldably resisting movement of said foot lever.

3. A structure as specified in claim 1 in combination with means for limiting the travel of said crosshead.

4. Apparatus for removing building tile from forming molds comprising a frame, a substantially rectangular table top carried by said frame, bracket members projecting laterally from said frame at the sides of said table top, arm members pivotally supported intermediately of their ends on said bracket members, mold engaging hooks carried by the upper ends of said arm members, guide means depending from said table top, a cross head movably supported on said guide means, a foot lever pivotally connected at one end to said frame, and link members pivotally connected at one end with said crosshead, the opposite ends of said link members being connected with the foot lever.

5. A structure as specified in claim 4 in combination with a coil spring connected at its ends with said foot lever and said frame.

6. Apparatus for removing building tile from forming molds comprising a vertically disposed frame having a rectangular outline when viewed in plan, a tile receiving plate mounted at the upper end of said frame, a plurality of vertically disposed arm members pivotally supported intermediately of the ends at the sides of said frame, mold engaging hooks secured to the ends of said arm members above said tile receiving plate, a vertically extending guide disposed at the central

portion of said frame, a crosshead movably supported by said guide, link means connecting the lower end portions of said arm members with said crosshead, and manually actuated means for moving said crosshead on said guide to increase the distance between said mold engaging hooks at the opposite sides of said tile receiving plate.

7. In apparatus for removing building tile from forming molds, a frame, a polygonal table top on said frame, lever means supported for pivotal movement about horizontal axes at the sides of said table top, mold engaging hooks carried by said lever means above the table top, and means for moving said lever means to vary the distances between said hooks at opposite sides of said table top.

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