W. M. VENABLE.

MOLD.

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1,129,144.

Patented Feb. 23, 1915.

2 SHEETS—SHEET 1.

Fig. 1

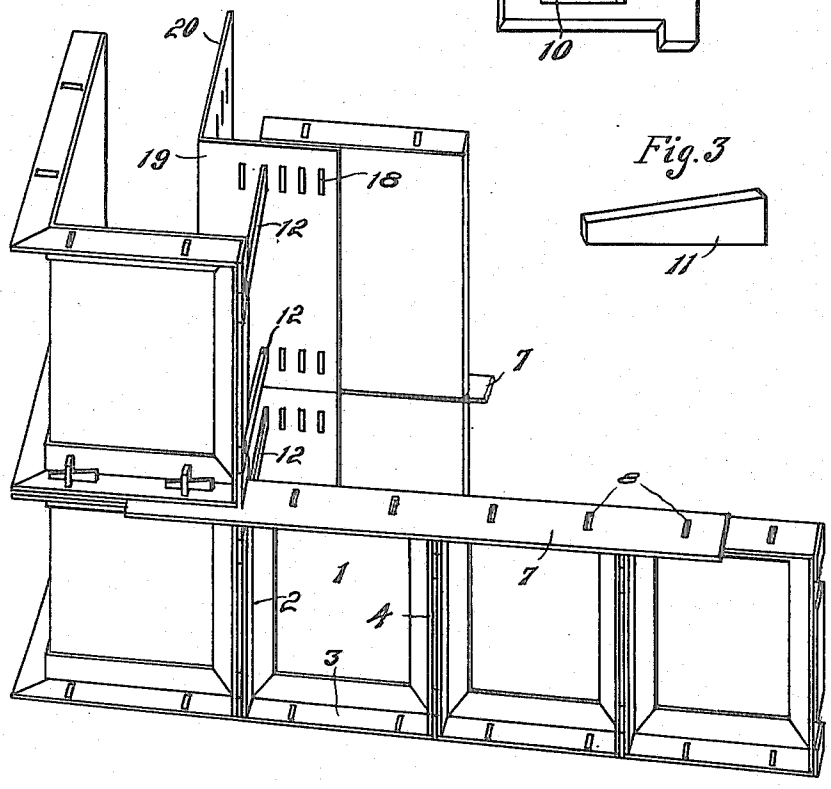



Fig. 2

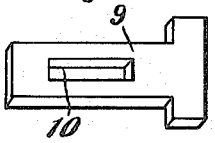
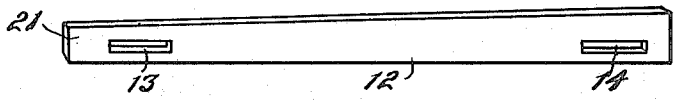



Fig. 3




Fig. 4




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2 SHEETS—SHEET 2.

*Fig. 5*

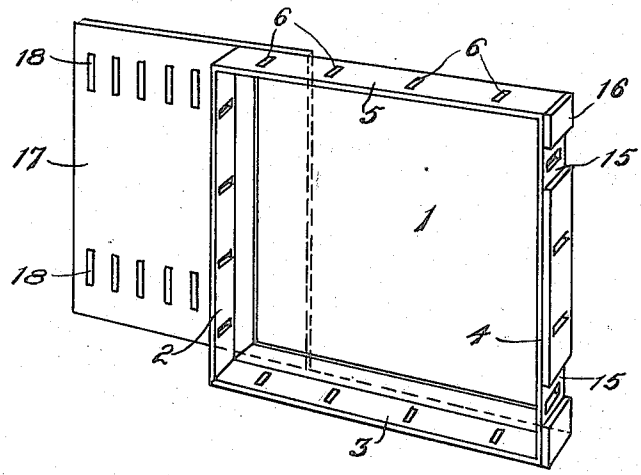
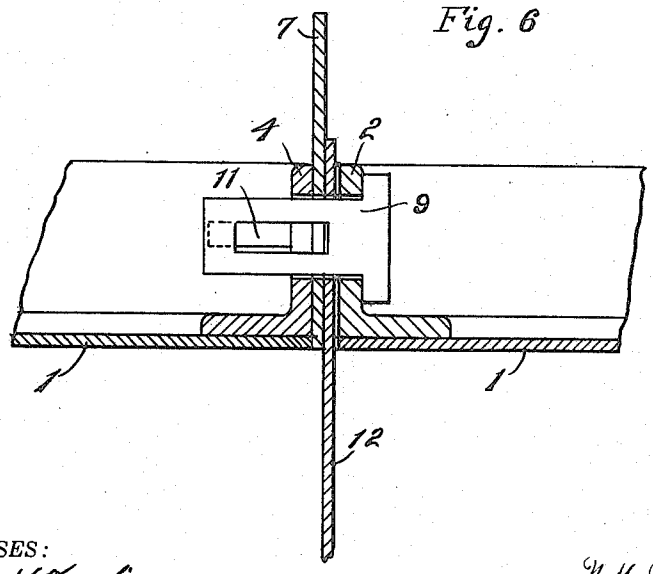



*Fig. 6*




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# UNITED STATES PATENT OFFICE.

WILLIAM MAYO VENABLE, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO BLAW COLLAPSIBLE STEEL CENTERING COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

## MOLD.

1,129,144. Specification of Letters Patent. Patented Feb. 23, 1915.

Application filed January 31, 1912. Serial No. 674,532.

*To all whom it may concern:*

Be it known that I, WILLIAM MAYO VENABLE, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Molds, of which the following is a specification.

The invention relates to molds or forms for use in the formation of walls, floors, ceilings and the like from plastic material such for example as concrete. The invention has for its primary objects; the provision of an improved metal panel construction whereby a mold may be built up from the individual panels as units, with a minimum amount of labor; the provision of a panel construction in which the labor usually incident to alining the panels is eliminated and a molding surface with all its component parts in perfect alinement is insured; the provision of a panel construction having improved means for reinforcing the construction laterally and which may be incorporated into the form without difficulty, as it is built up, and without the use of additional securing means; the provision of an improved fastening means so constructed that one size and form only of fastening element is required throughout the mold; and the provision of a built-up form construction in which the constituent panels are reversible and interchangeable.

One embodiment of my invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a perspective view showing a partially built up mold or form;

Figure 2 is a perspective view on an enlarged scale, of the fastening elements used through the form;

Figure 3 is a perspective view of the securing wedge for engaging the slot in the fastening element of Figure 2;

Figure 4 is a perspective view of the tie bar;

Figure 5 is a perspective view of two of the panels employed in the construction;

Figure 6 is an enlarged section at the juncture between two panels, a stiffening plate, and a tie bar.

The form is made up primarily of units in the form of square metal panels, one of which is shown on an enlarged scale in Fig. 5. These panels each consist of a sheet metal plate 1, to the four edges of which are secured the angles 2, 3, 4, and 5. These angles are secured to the plate 1 preferably by riveting or spot welding, and in the construction illustrated the flanges of these angles are provided with four slots or perforations 6, although this number may obviously be varied to suit conditions, two slots only being shown on each flange in Fig. 1, which is in a measure diagrammatic.

The form is built up from the panels as indicated in Fig. 1, such panels being placed side by side and end to end until a form of the desired size is secured. In order to secure the necessary lateral stiffness and to bring the faces of the panels into exact alinement liner plates 7 are placed between the flanges of adjacent rows of panels, such plates extending past the joints between the various panels, and serve to give the required amount of rigidity to the structure and to aline the parts. Stiffening or alining plates may be used at each joint between the rows or not, as required, and may be used either between the vertical joints or the horizontal joints, depending upon the requirements of the case. The stiffening or alining plates 7 are provided with slots 8 which are spaced the same distance apart as the slots 6 in the flanges of the angles upon the panels, and are so positioned with respect to edge of the plate that when the fastening members are inserted the faces of the panels and the edge of the stiffening plates are in alinement.

The securing means employed is illustrated in Figs. 2 and 3 and comprises a flat T shaped element or bolt 9 having a slot 10 in which the wedge 11 is adapted to fit.

The opposing sides of the form are held in their proper relative positions by means of the tie bars 12 (Fig. 1), which tie bars are preferably tapering as indicated in Fig. 4 and are provided in each end with the slots 13 and 14. Each panel is provided upon one edge with slots 15 for receiving the ends of the tie bars, such slots being provided for by welding strips 16 to the flanges of the angles 4 and leaving out sections of such strips at the points 15. The connection at the point 15 where a stiffening plate 7 is employed vertically is indicated in Fig. 6 on enlarged scale. From this view it will be seen that the fastening element or bar 9

extends through the flanges 2 and 4 of the flanges upon the panels, and through the stiffening plate 7 and the tie bar 12, so that all of these parts are secured by this one fastening means. It will be of course understood that it is immaterial whether the panel occupies the position indicated in Fig. 5 or whether it is turned 90 degrees so that the strip 16 lies either at the top or the bottom of the panel instead of at the side thereof. Only one size of fastening element 9 is required for the entire structure, the slot 10 and the wedge 11 being of such proportions that the fastener may be used where there are four elements to be secured as in Fig. 6, or where either the stiffening plate or the tie bar are omitted, or where the flanges on the panels abut directly against each other and there are no interposed members.

As hitherto pointed out, the panels are preferably square, the over-all dimension of the panel including the strip 16, being the same as the other over-all dimension at right angles thereto, thus permitting the panel to be used in the position indicated in Fig. 5 or in another position in which the strip 16 is horizontal instead of vertical. The spacing between the slots 6 in each flange of each panel is also uniform, and the distance from the end slots in each flange from the end of the plate is equal to one-half the distance between the slots, so that the spacing of the slots 8 in the stiffening plates 7 (Fig. 1) may be made uniform, and so that such slots 8 will always register with the slots 6. This arrangement of spacing of the slots 6 also permits the plates in adjacent rows to be offset with respect to each other, without causing the slots in the flanges to come out of registration. As illustrated in Fig. 1 the panels in the upper row are in alinement with the panels in the lower row, but in some cases it may be desirable to make break joints with respect to the panels of the two rows, and the arrangement of spacing of the slots 6 permits this to be done without causing a mismating of any of such slots in the flanges of opposing panels. Usually it is necessary to insert the fastening means 9 through a portion only of the slots 6.

A lapping panel 17 is illustrated in Fig. 5, such panel being required where the length of the walls being constructed is such that the series of standard panels will not exactly complete the distance. The plate 17 is held in position against lateral movement by means of the tie bars 12 which extend through those of the slots 18 coming in alinement with the transverse slots 15. This method of holding the lap plates by means of the tie bars 12 is illustrated as applied to a slightly different form of lap plate in Fig. 1, the only difference being that the lap plate 19 in Fig. 1 occurs at the corner of the wall and is provided with portion 20 also slotted and bent at right angles to the portion of the plate shown as engaging the tie bars 12. It will be seen that the tie bars 12 extending through the slots 18 in the lap plate prevent such lap plate from moving either vertically or horizontally. The lap plate may be used at the end of the wall and be of the type indicated in Fig. 1, or may be used at a point removed from the end of the wall and be of the type indicated in Fig. 5. In some cases the lap plate is entirely free, and in other cases it is welded at one edge to one of the plates 1, the other edge being free. In order to fill out the required space to complete a wall, panels of a fraction of the width of the standard panel may be used in some cases, the other dimension of the panel however remaining the same as in the standard panel.

The slots 15 (Fig. 5) for receiving the tie bars 12 are placed at the same distance from the ends of the panels in all cases, so that the slots on opposite sides of the wall are always in substantial alinement, and the bars 12 are made tapering as indicated in Fig. 4 in order that they may be readily driven from their positions after the concrete has partially set, the end 21 (Fig. 4) being of such a length that it projects out past the flanges 2 and 4 (Fig. 6) and may be readily struck with a hammer in order to loosen it. The slots 8 in the stiffening plates 7 while being spaced similarly to the slots 6 in the flanges of the angles of the panels, and being of the same length as such slots 6, are preferably slightly greater in width in order to more readily permit the insertion of the elements 9. The making of the holding elements 9 flat is desirable, in that the panels are thus prevented from becoming twisted relatively about such holding elements as an axis, as would be the case if a round holding element were used. It will be noted that no labor is required to bring the various panels into alinement, as the insertion of the element 9 automatically brings the working faces of the panels into exact alinement. Similarly the use of the elements 9 in connection with the stiffening plates 7 serves to bring all of the panels comprising a row into proper alinement. It will also be noted that no care need be exercised in getting the two sides of the form at the proper distance apart, as the two forms must be necessarily brought to the exact distance apart when the holding elements 9 are forced through the slots 13 and 14 in the tie bars 12. The whole form may therefore be assembled by unskilled labor with the assurance that the relation of all the parts of the form will be absolutely correct. The use of a square

standard panel with the spacing as heretofore described, and the one size of holding element 9 reduces the number of different parts required in the mold to a minimum, thus reducing the cost of the equipment required for a particular piece of work to its lowest limits. The labor incident to the assembling and disassembling of the form is still further reduced by reason of the fact that the stiffening plates 7 and tie bars 12 require no additional holding means, the elements 9 which are required for securing the flanges of the panels together also serving to secure the tie bars and stiffening plates. Other advantages incident to the construction will be apparent to those skilled in the art.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is the following:

In combination in a form, a row of rectangular metal panels having perforated flanges at their edges; a second row of panels also having perforated flanges at their edges, with their perforated flanges in opposition to the flanges of the first row; a stiffening and alining plate provided with perforations corresponding in spaceing to the perforations in the said flanges and lying between the two sets of flanges; and clamping bars extending through the said perforations in the stiffening plate and both sets of flanges, the said perforations in the flanges and stiffening plate being positioned at substantially the same distance from the working faces of the panels and the edge of the plate so that the said faces and the edge of the plate are brought into substantial alinement when the clamping bars are inserted through the said perforations.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

WM. MAYO VENABLE.

Witnesses:

LETITIA A. MYERS,

ARCHWORTH MARTIN.