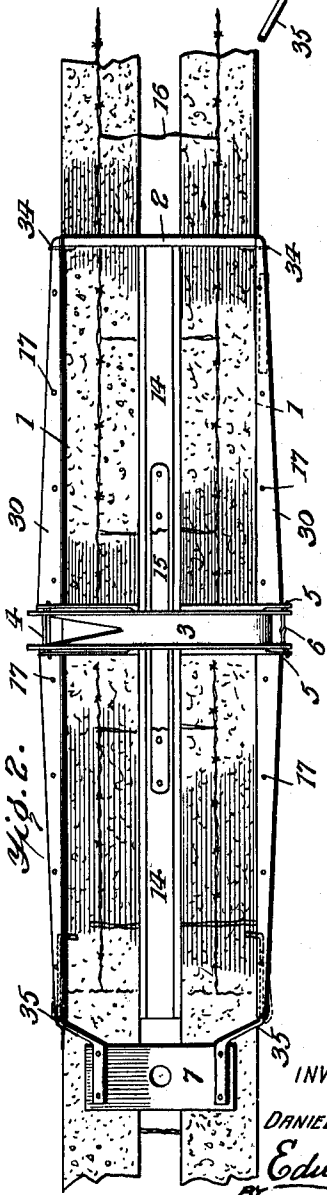
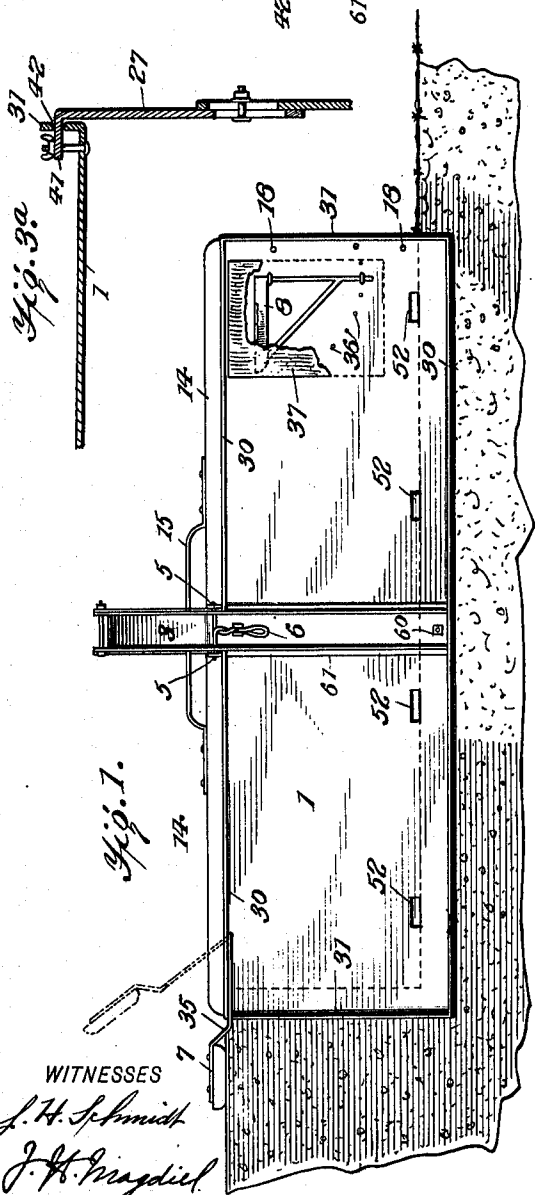
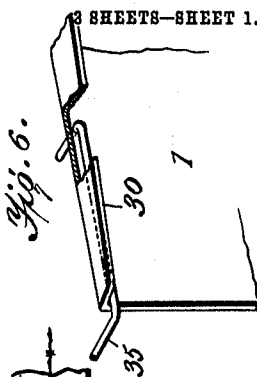
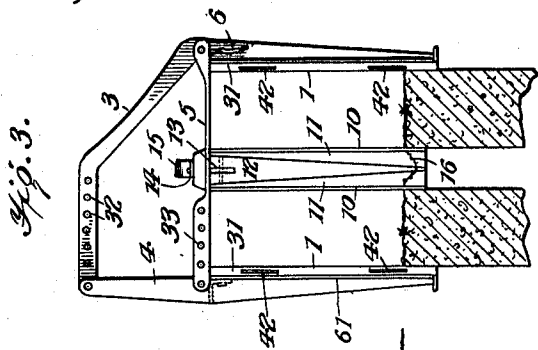


D. H. MAGDIEL.  
MOLD FOR CONCRETE WALLS.  
APPLICATION FILED OCT. 20, 1908.

945,182.

Patented Jan. 4, 1910.

3 SHEETS—SHEET 1.



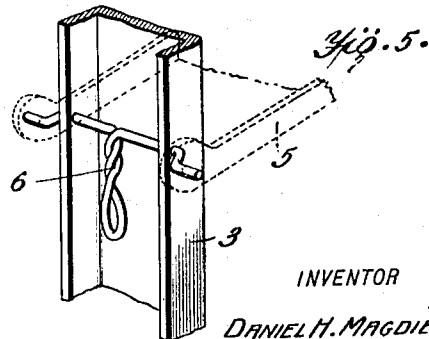
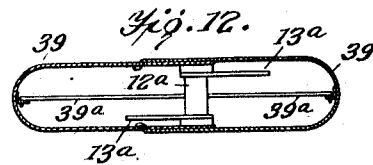
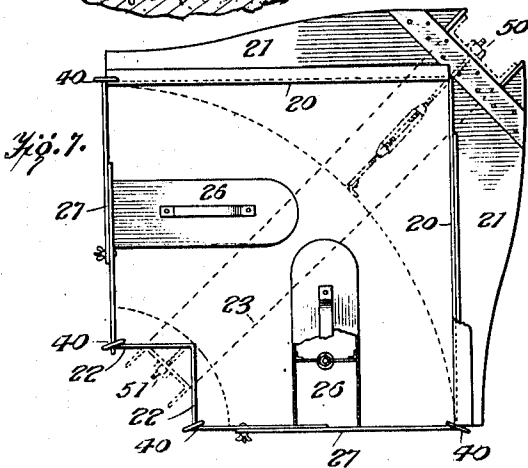
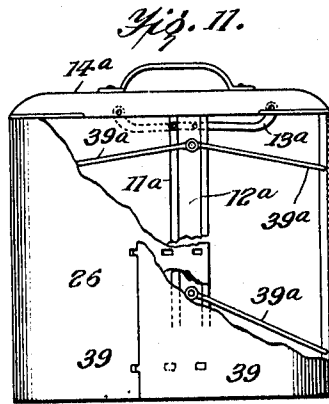
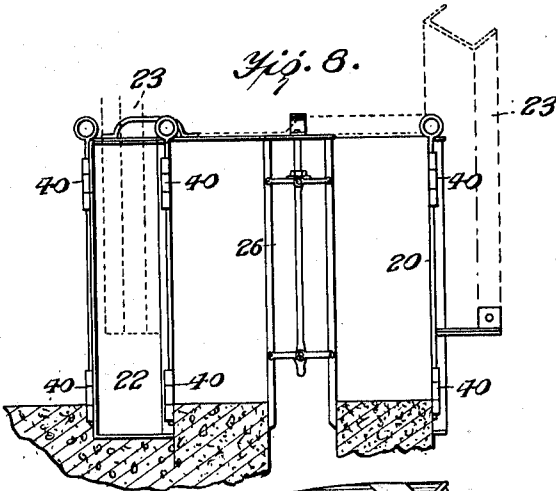
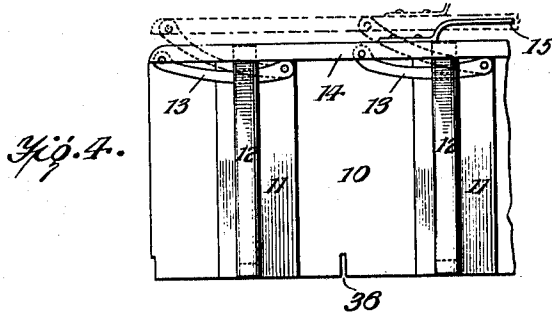
WITNESSES  
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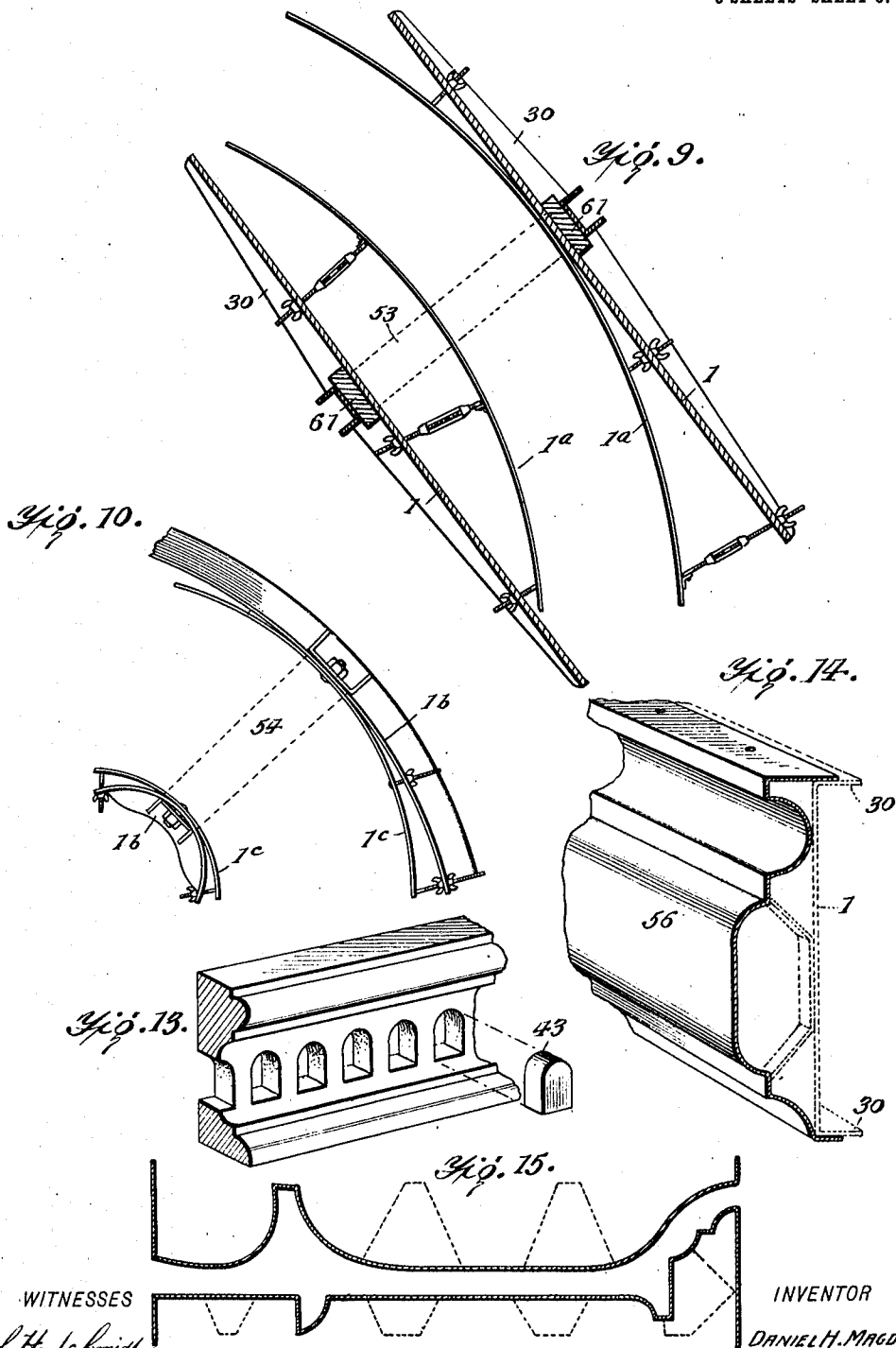
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WITNESSES

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# UNITED STATES PATENT OFFICE.

DANIEL H. MAGDIEL, OF SALT LAKE CITY, UTAH, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO MAGDIEL-MORRIS MANUFACTURING COMPANY, OF SALT LAKE CITY, UTAH, A CORPORATION OF UTAH.

## MOLD FOR CONCRETE WALLS.

945,182.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed October 20, 1908. Serial No. 458,647.

To all whom it may concern:

Be it known that I, DANIEL H. MAGDIEL, a subject of the Crown of Great Britain, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Molds for Concrete Walls, of which the following is a specification.

My invention relates to molds to be used in my new and useful system of constructing concrete walls for buildings etc., either hollow or solid.

It is an improvement in that form of mold, in which two outer parallel side pieces form the outer sides of the mold, which are held together by adjustable clamping devices against the upper sides of the wall already built and two parallel inner side pieces are arranged between the outer sides and are provided with spreading wedges to first hold and then release the inner side pieces in forming the hollow air spaces in the wall.

My invention consists in the novel construction and arrangement of a mold operating on this general principle, which shall be light, simple of construction, easily operated and of universal application for building walls of any shape, as hereinafter more fully described with reference to the drawing, in which—

Figure 1 is a side elevation of the mold shown applied to a concrete wall in process of construction. Fig. 2 is a top plan view of the same. Fig. 3 is an end view. Fig. 3<sup>a</sup> is a detail of the modified form of end gate. Fig. 4 is a half inside view of the air-space forming devices. Fig. 5 is a detailed view in perspective of the clamp-locking device for the outer side casings. Fig. 6 is a detailed view of the spring shanks for the supporting foot for holding up one end of the mold. Figs. 7 and 8 are a plan and end view respectively of the mold for forming corners of the wall. Figs. 9 and 10 are top plan views of modifications of the mold shown in Figs. 1 and 2, for forming curved walls. Figs. 11 and 12 are respectively a sectional side view and a sectional top plan view of modified means for forming air spaces at the corners of the wall. Fig. 13 presents views showing how openings of any shape may be formed in the wall in the construction of balustrades etc. Fig. 14 is a de-

tail in perspective of one of a series of interchangeable face plates which may be placed in the mold for giving variations of contour or for ornamental effect and Fig. 15 are views of similar shapes for forming gutters and cornices.

Referring to Figs. 1, 2 and 3, the mold consists of two thin metal sides 1—1 which at their lower and upper edges, as well as the ends, are bent outwardly to form flanges 30 and 31. The flanges 30 on the top and bottom are wider at the center than the flanges on the end in order to withstand the greater outward strain imposed on the side plates. There are holes 17 in the flanges at certain intervals to receive the plates and attachments hereinafter described. The two sides 1—1 are fastened and held together by the clamp arms 3 and 4 and transverse tension strap 5 connected to the middle of both clamp arms which in connection with the clamping lever 6 make it possible to fasten or loosen the mold on the wall in an instant. The clamp arms 3 and 4 are of channel-iron cross section, as seen in Fig. 5. Arm 4 is straight and extends some distance above the side plate to which it is rigidly attached. The arm 3 is rigidly attached to the other side plate and in extending across the mold in one piece is bent twice at 45 degrees. The channel construction is not only strong and light, but houses and protects lever 6 which has axial extensions journaled in the clamp and crank arms journaled in the tension straps 5 as seen in Fig. 5. It will be seen from Fig. 3 that the bent arm 3 extends inclinedly across the mold from the top of one side plate to the top of the upright arm 4 on the other side. This causes the arm 3 to drop below and be out of the way of line of travel of the conveyer buckets in filling the mold and also makes a direct connection across the mold.

The head end plate 2 of the mold gages the thickness of the wall and keeps the mold in a level position by resting on the completed wall below. It also prevents the concrete from rolling or caving out into the air space while being tamped in the mold. The end plate 2 is made in different sizes so as to correspond with the clamp 3 and strap 5, both of which have holes 32 and 33 at certain intervals to adjust the mold to a varying width or thickness of the wall. The

end plate 2 is detachably held in place by pins 34 on the plate entering holes 18 in the side plate.

At the back of the mold is arranged a foot 7 to support the mold in a level position. This rests on the higher level of the layer of wall last laid. It is detachable and adjustable to any size of wall. It can also be turned up as in dotted lines in Fig. 1, so as to give the operator a chance to butt the back end of the mold close up to the window or door frames. The shanks 35 of the foot are springs with inturned ends that enter holes in the side plates as in Fig. 6. They may be sprung out and removed, but when caught under flange 30 they support the mold. This foot 7 occupies a position midway between the two side plates of the mold and when turned down projects beyond the ends of the side plates.

On the side of the mold is a spirit level 8 inserted in a bracket which is fastened with hinges to the working side of the mold. This level makes it possible for the operator to set his mold level for every move and by turning the bracket out to a right angle with the wall gives him the plumb of the wall. This bracket has its lower bearing made adjustable in any one of the holes 36 in the plates so that it can be set to any angle up to 45 degrees to give an angular adjustment to the vertical axis of the bracket and thus make it possible to work up along side of a hill or where a sloping wall is wanted. To protect the spirit level from falling concrete a shield or apron 37 of leather or other suitable material is fastened above the spirit level to the mold and overhangs the glass tube. With reference to this spirit level attachment, I would state that I make no claim to the same in this application, as I have made it the basis of a separate subsequent application filed May 22, 1909, Serial No. 497,762.

The core for making a continuous air space in the hollow wall consists of two sides 10—10, Figs. 3 and 4, which have riveted or screwed on their inner sides a plurality of vertical wedge shaped wooden plates 11, which are arranged in pairs, the two members of each pair being on the opposite sides 10, 10. The plates 11, 11, of each pair are thickest at the bottom and cooperate with intermediate movable wedges 12 which are thickest at the top and of which there are four, more or less, all connected and operated together. The wedges 12 are rounded on the sides where they touch plate 11 so as to prevent friction when forced in or out. They are operated by levers 13 which are pivoted to lid 14 which acts as a parallel-moving cover for sides 10—10 to prevent concrete from falling into the air space. The lid 14 is a long bar extending the length of the mold and operated

by handle 15. One end of each lever 13 is pivoted to lid 14, the other end to its stationary plate 11 and the middle is pivoted to the wedge 12. The two outer side plates of the mold, the two inner side plates, and the lid or cover 14, are all of the same length. The sides 10—10 have narrow slots 38 one foot apart in their lower edges so as to pass down over the cross anchors or wall ties 16. The vertical slots 42 in end flanges 31 of the sides, see Fig. 3, are for the insertion and fastening of extra doors as hereinafter described.

I will now describe the corner mold, reference being had to Figs. 7 and 8. This consists of outer sides 20—20 riveted to angle iron 21 which connects them as one and holds them square. 22 are the inside corner walls. The same clamp shown in Figs. 1, 2 and 3, at 3, 4 and 6, is here used to hold the outer sides 20—20 to the inner side 22, the position of the clamp being shown at 23 in dotted lines in Figs. 7 and 8 entering the seats 50 and 51. The outer seat 50 is formed by the projections of the angle irons 21, 21, on each side of the diagonal line of the corner. 26 is the collapsible core. For the corners these are made in short sections as in Figs. 11 and 12. The lid and wedge action is the same as in Figs. 3 and 4, *i. e.*, in Figs. 11 and 12, 14<sup>a</sup> is the lid, 13<sup>a</sup> the levers, 12<sup>a</sup> the movable wedges and 11<sup>a</sup> the stationary wedges attached to the sides of the core. The core, however, is made semi-elliptical curved sections 39—39, which are projected away from each other or drawn together by toggle arms 39<sup>a</sup>, Figs. 11 and 12, pivoted to the movable wedges 12<sup>a</sup>.

In the side plate 1 near the bottom, see Fig. 1, are slots 52 a foot or so apart. These are for the purpose of allowing loops or eyes to protrude through the side plates, which loops or eyes are made of wire with their ends embedded in the concrete of the wall and with the loops protruding through the plates, said loops forming anchorages for holding the scaffold on which the workmen stand as the wall is built up and which loops after having served their purpose are bent flat against the wall and plastered over, remaining permanently in the wall.

At the ends of the corner molds are adjustable end gates 27 which are fastened to the sides 20—22 with hinges 40. These end gates or doors are interchangeable with the doors on the main mold Fig. 2 and have, see Fig. 3<sup>a</sup>, extensions 41 to be inserted in slots 42 in the main mold.

I will now describe how the mold shown in Figs. 1 to 3 may be used to build circular or irregular walls, reference being had to Figs. 9 and 10. In this case, Fig. 9, the plates 1—1 of Figs. 1 to 3 have curved flexible inner plates 1<sup>a</sup> 1<sup>a</sup> connected to them by screw-rods, nuts and turn buckles for ad-

justability for any radius. The same clamp is here used, as shown in dotted lines 53. For very small circles the side plates may be curved as at 1° in Fig. 10 and supplemental adjustable plates 1° may be used inside of these, the two sets of plates being connected transversely by the same clamp already described and shown in dotted lines at 54. To form balustrades, a core of any shape, as 43 in Fig. 13, is put in the mold and the concrete packed around it.

Fig. 14 shows one form of a series of extra faces which can easily be attached to the interior of the building mold for the purpose of forming water tables, cornices, hand-rails for bridges, fences, stairways etc. To apply these face plates the sides 1—1 Fig. 2, have holes 17 Fig. 2 in both ends and side flanges and registering with these holes are other holes in the right angular flanges of the edges of the faces 56 Fig. 14. Bolts are passed through these registering holes to firmly secure the detachable faces inside the mold. These supplemental face plates 56 are of the same vertical depth as the outer sides 1 of the mold, as seen in Fig. 14, and the upper and lower flanges fit closely to and slip over the flanges 30 of the outer sides. All other inner face plates used in this mold are also of the same vertical depth as the outer plates.

As shown in the drawings the reinforcing runs unbroken through the length of the wall and there is a perfect continuous air space through the length of the wall which prevents the dampness existing in the regular solid or concrete wall. It also makes it frost proof, cool in summer and warm in winter.

The advantages of this universal building mold are that it is plain and simple, quickly and easily operated, substantial and light, and can be handled by one man. It builds the walls directly from the mixer and makes solid reinforced walls without joints or cracks with a continuous air space throughout.

In carrying out my invention I would have it understood that I do not confine myself to the specific construction shown and described, as this may be varied in various details without departing from my invention as claimed.

It will be understood that the clamp arms 3, 4 are bolted to the sides 1, as shown at 60, so that the sides follow the clamps when loosened, and vertical transverse stiffening strips 61 lie between the sides and the clamp arms.

I claim:

1. A wall mold comprising two sides and a clamp for holding the sides together consisting of a straight upright clamp arm rigidly fixed to one side of the mold and projecting above it, a separate bent clamp arm

fastened rigidly to the other side of the mold and extending inclinedly across from one side to the other from the top edge of one mold side to the upwardly extended arm on the other side and pivotally connected to the upper end of the first named arm; a tension strap arranged transversely to the sides and connecting the two clamp arms together about the middle and a locking device connecting one end of the tension strap to one of the clamp arms.

2. A wall mold, comprising two sides and a clamp for holding the sides together consisting of a straight upright clamp arm, a separate bent clamp arm extending inclinedly across from one side to the other and pivotally connected to the upper end of the first named arm, a tension strap arranged transversely to the sides and connecting the two clamp arms together about the middle, a locking device connecting one end of the tension strap to one of the clamp arms, the clamping arms being made of channeled cross section and the locking device being arranged within the channel and constructed as a lever with double crank shaft adjustably connecting the clamp arm and tension strap.

3. A wall mold comprising two sides and a clamp for holding the sides together consisting of a straight upright clamp arm rigidly fixed to one side of the mold and projecting above it, a separate bent clamp arm fastened rigidly to the other side of the mold and extending inclinedly across from one side to the other from the top edge of one mold side to the upwardly extended arm on the other side and pivotally connected to the upper end of the first named arm, a tension strap arranged transversely to the sides and connecting the two clamp arms together about the middle and a locking device connecting one end of the tension strap to one of the clamp arms, the bent arm and tension strap being formed with a series of holes for adjustment to the thickness of the wall.

4. A wall mold having at one end a supporting foot, arranged at the upper edge of the mold in middle position between its sides, connected to the mold and projecting beyond the end of the same to rest on the previously laid wall layer.

5. A wall mold having at one end a supporting foot arranged at the upper edge of the mold in middle position between its sides and pivotally connected to the mold and projecting beyond the end of the same to rest on the previously laid wall layer, said foot being made adjustable to a position inside the end of the mold to allow the mold to be butted up against a vertical face.

6. A wall mold having at one end a supporting foot arranged at the upper edge of the mold and projecting beyond the same to rest on the previously laid wall layer, the

foot being formed with spring shanks having inturned ends and the upper edge of the wall mold being formed with holes to receive said ends and an overhanging flange to rest on the shanks.

7. A mold for making continuous hollow walls, comprising two outer side pieces, two inner side pieces of equal length to the outer ones having on their inner faces a plurality of vertically arranged and fixed wedge-shaped strips largest at the bottom, a plurality of movable wedges largest at the top corresponding in number to and arranged between pairs of the said strips and a movable cover-lid of equal length to the side pieces having connection with the movable wedges and covering and closing the top of the space between the two side pieces.

8. A mold for making continuous hollow walls, comprising two outer side pieces, two inner side pieces of equal length to the outer ones having on their inner faces a plurality of vertically arranged and fixed wedge-shaped strips largest at the bottom, a plurality of movable wedges largest at the top corresponding in number to and arranged between the pairs of the said strips, a movable cover-lid of equal length to the side pieces, having a lever connection with each of the movable wedges and operating the same by the movement of the lid in opening and closing the same.

9. A mold for making hollow walls, comprising two side pieces adjustable to or from each other, a cover lid of equal length to the side pieces extending over and closing the space between the side pieces, and spreading devices for the side pieces arranged between the same and beneath the lid and connected to be operated by the movement of the lid, said spreading devices consisting of reversely inclined wedges and levers connecting the wedges, side pieces and lid for parallel motion of the lid in opening and closing the same.

10. A wall mold for corners consisting of an outer wall casing and an inner wall casing, both extending around the corner angle and made in separate pieces with seat spaces for a clamp, the outer seat space being formed by projecting flanges on the opposite sides of the diagonal line, and the inner seat being formed by the inner angle of the mold and a clamp for the two pieces arranged diagonally in said seat spaces and held in position thereby.

11. The core mold for the corner mold consisting of semi-elliptical side pieces, reversely arranged wedges, one set of which is fixed and the other movable, a cover lid, levers connecting the cover lid to the movable wedge and fulcrumed to the side pieces and toggle arms connecting the movable wedge to the ends of the side pieces.

12. A wall mold for irregular forms of walls, consisting of outer side pieces, a clamp for holding the same together comprising a straight arm rigidly attached to one side and extending above it, a bent arm pivotally connected at its upper end to the top of the straight arm and extending downwardly at an angle to the top of the other side piece and down to the lower edge of the same, a tension strap connecting the middle portion of the clamp arms, a locking lever for the tension strap and arms and interior supplemental face plates of varying forms but of equal vertical depth to the outer side pieces and means for adjustably holding them in the main outer side pieces.

13. A wall mold for irregular forms of walls, consisting of outer side pieces, a clamp for holding the same together comprising a straight arm, a bent arm connected at its upper end to the straight arm, a tension strap connecting the middle portion of the clamp arms, a locking lever for the tension strap and arms and interior supplemental face plates of varying forms and means for adjustably holding them in the main outer side pieces, said inner face plates being flexible and adjustable to varying curves and means for fixing said adjustment.

14. A wall mold for ornamental forms of walls, consisting of outer metal side plates having perforated flanges along the top and bottom to receive supplemental inner face plates and stiffen the sides and a transverse clamp for holding them together consisting of two pivotally connected arms rigidly connected to the side pieces, supplemental inner face plates of the same vertical depth as the outer side plates having perforated out-turned flanges registering with the perforations of the flanges of the side plates and means for securing the same.

15. A wall mold for curved walls, consisting of outer metal side plates having flanges along the top and bottom, a transverse clamp for holding them together, curved flexible inner face plates and adjustable means connecting the curved flexible inner plates to the flanged outer side plates to spring the curve to the proper radius.

16. A wall mold for curved walls, consisting of outer metal side plates, means for holding them together, curved flexible inner face plates and adjustable means connecting the curved flexible inner face plates to the outer side plates to spring the curve to the proper radius.

In testimony whereof I affix my signature in presence of two witnesses.

DANIEL H. MAGDIEL.

Witnesses:

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JOHN R. WINDER.