W. N. BRITTON.

MOLD.

APPLICATION FILED MAR. 5, 1913.

1,173,166.

Patented Feb. 29, 1916.

3 SHEETS—SHEET 1.

Fig. 1

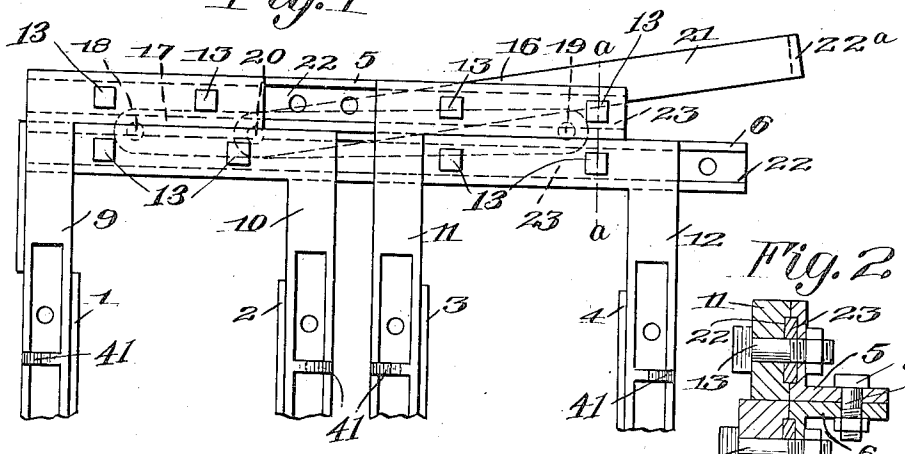


Fig. 2

Fig. 3

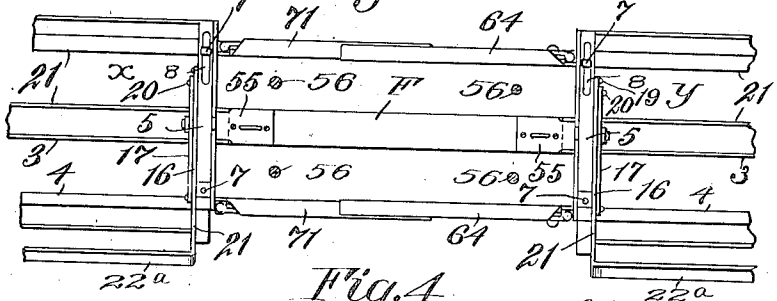
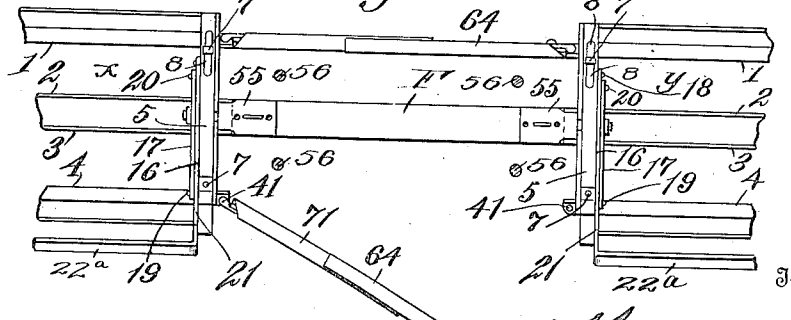


Fig. 4



Witnesses

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3 SHEETS—SHEET 2.

Fig. 5

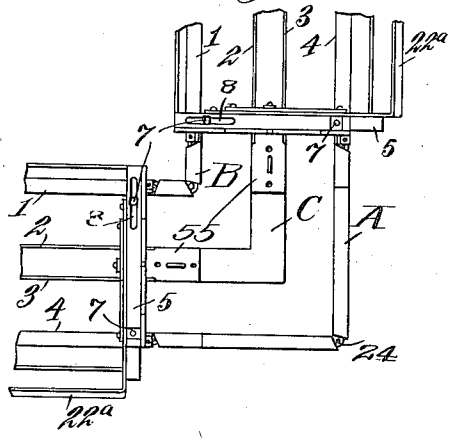


Fig. 6

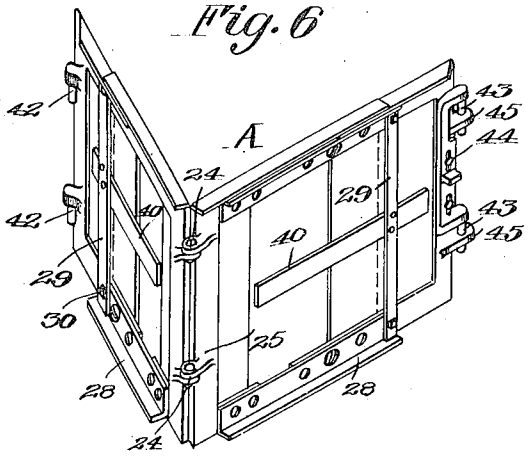


Fig. 9

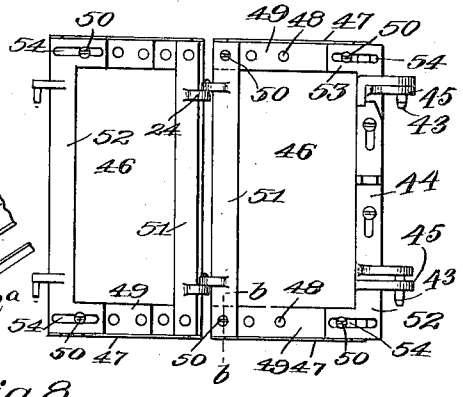


Fig. 7

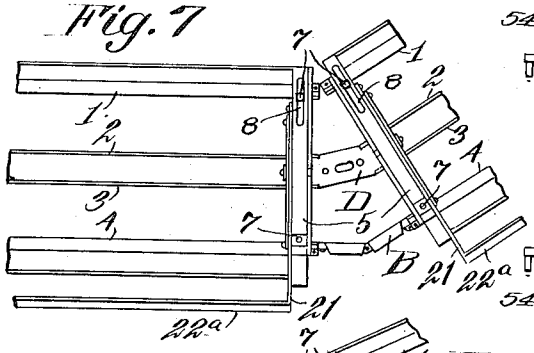


Fig. 8

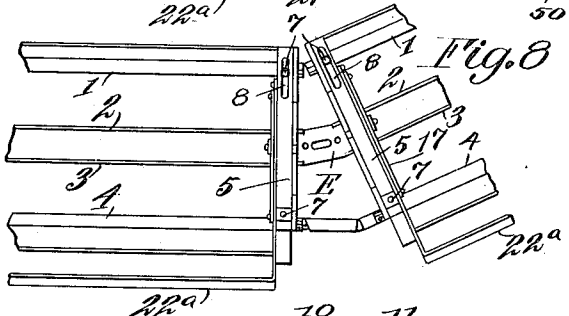


Fig. 10

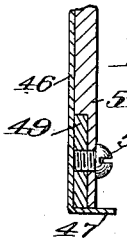
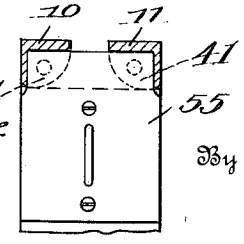


Fig. 11



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3 SHEETS—SHEET 3.

Fig. 12

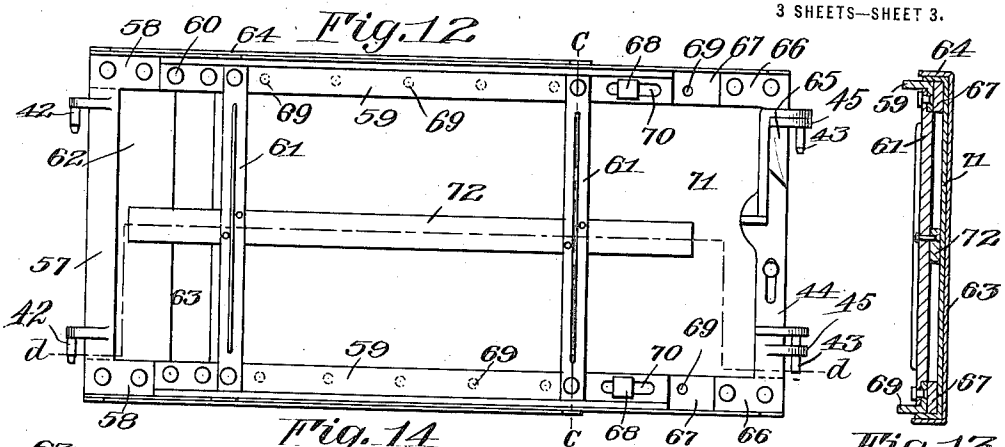


Fig. 14

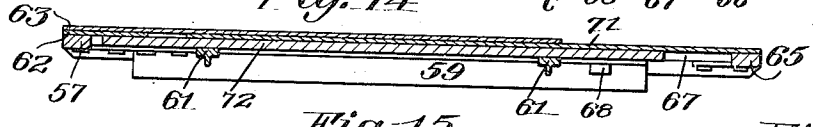


Fig. 13

Fig. 15

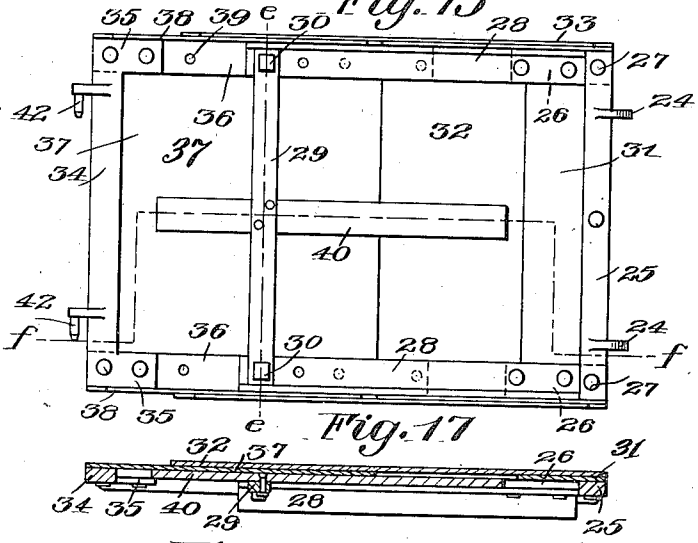


Fig. 16

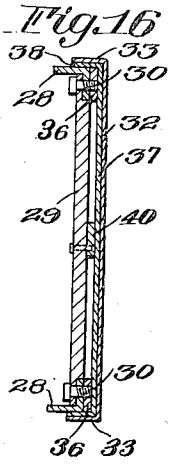
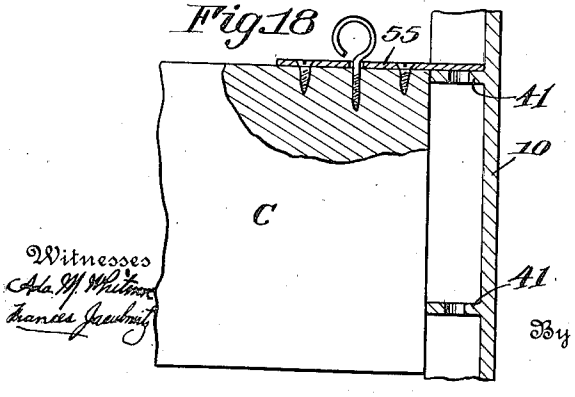


Fig. 17

Fig. 18



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UNITED STATES PATENT OFFICE.

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MOLD.

1,173,166. Specification of Letters Patent. Patented Feb. 29, 1916.

Application filed March 5, 1913. Serial No. 752,130.

To all whom it may concern:

Be it known that I, WILLIS N. BRITTON, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Molds, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

The present invention relates to molding machines and more particularly to that type in which a portable structure is employed for building cement walls *in situ*.

An object of this invention is to provide attachments to be used with such machines for the purpose of adapting them for forming various angles and corners in the walls and for passing about upright elements such as metal reinforcements, flues and the like.

To these and other ends the invention consists in certain parts and combinations of parts all of which will be hereinafter described, the novel features being pointed out in the appended claims.

In the drawing: Figure 1 is a detail view of the upper portion of a molding machine, showing certain improvements therein; Fig. 2 is a section on the line *a*—*a*, Fig. 1; Fig. 3 is a top view of two molding machines connected by two straight mold walls for passing about upright elements such as metallic reinforcements; Fig. 4 is a similar view showing one of the connecting mold walls swung outwardly to free the same from the molded wall; Fig. 5 is a top view of portions of two machines with angled mold walls connecting them for forming a right angled corner; Fig. 6 is a perspective view of one of the corner-forming mold walls; Fig. 7 is a top view of portions of two machines connected by one of the corner-forming walls used in Fig. 5; Fig. 8 is a top view of portions of two machines connected by an angled corner-forming wall of rigid construction; Fig. 9 is a plan view of the corner-forming wall shown in Figs. 5 and 7; Fig. 10 is a section on the line *b*—*b*, Fig. 9; Fig. 11 is a detail view showing the manner in which the core pieces are supported at the ends of the inner face-forming members of the molding machines; Fig. 12 is a side view of one of the connecting pieces shown in Figs. 3 and 4; Fig. 13 is a section on the line *c*—*c*, Fig. 12; Fig. 14 is a section on the line *d*—*d*, Fig. 12; Fig. 15 shows, in plan, one of the hinged members of the mold wall shown in Fig. 6; Fig. 16 is a section on the line *e*—*e*, Fig. 15; Fig. 17 is a section on the line *f*—*f*, Fig. 15; and Fig. 18 is a detail sectional view illustrating the manner in which the core members are supported on the molding machines.

The molding machines illustrated in this invention embody four walls 1, 2, 3 and 4 formed from sheet metal, the walls 1 and 4 providing outer face-forming members for forming the outer faces of the wall and the walls 2 and 3 providing inner face-forming members for forming inner faces on the walls of the buildings for the provision of an air space.

In the illustrated embodiment, the connections between these walls for permitting the relative movement thereof for the purpose of removing the machine after a portion of the wall has been formed, comprise two slide members arranged at opposite ends of the walls above the latter. These members, in this instance, comprise angle irons 5 and 6 arranged one above the other in abutting relation and being tied together by bolts 7 operating in slots 8 to limit the sliding movement. To these slide members, frame pieces 9, 10, 11 and 12 are connected, said frame pieces also being connected to the mold walls 1, 2, 3 and 4. In this instance, these frame pieces are in the form of inverted L-shaped members having their vertical portions connected to the walls 1, 2, 3 and 4 and their horizontal portions connected to the slide members 5 and 6, the frames 10 and 12 being connected to the lower slide member 6 and the frames 9 and 11 being connected to the upper slide member 5. This connection between the slides and the frame pieces, in this instance, is maintained by bolts 13, bolt openings being provided in the slide members 5 and 6 and also in the horizontal or laterally extending portions of the frame pieces 9, 10, 11 and 12, the number of said openings being sufficient to permit the frame pieces carried by each slide member to be adjusted relatively to each other so that walls of different thicknesses may be formed.

For the purpose of strengthening the connection between the frame pieces 9, 10, 11 and 12 and the slide members 5 and 6, the opposed faces of these parts are provided with matching horizontal grooves 22 which receive keys or strips 23. These keys or strips 23 bridge the joints between the frame pieces and the slide members and take the

strain off the bolts 13, said bolts passing through the strips and holding the latter in place.

It will be noted that one of the inner face-forming members and one of the outer face-forming members are carried by the upper slide 5 while the lower slide 6 also carries one of said members. In this way, if the slides are moved in one direction, the outer face-forming members move away from one another while the inner face-forming members move toward one another, thus enlarging the mold chambers, whereas, if the slide members 5 and 6 are moved in the other direction, a reverse movement of the face-forming members take place. Any suitable mechanism may be employed for effecting these movements. In the present instance, two links 16 and 17 are pivoted at 18 and 19 respectively to slide 6 and the slide 5, being in turn pivoted together at 20 to provide a toggle. Extending from the link 16 is an arm 21 which is connected to a like arm at the other end of the molding machine by a bar 22^a forming a common operating member for the toggles.

In the embodiment of the invention shown in Figs. 3 and 4, provision is made for connecting two molding machines in such a manner that the wall may be molded with vertically reinforcing portions at intervals about the same. The reinforcing pieces are indicated at 56 while the two molding machines are indicated by the letters *x* and *y*. The connecting walls are the same on both sides of the machine while the core-piece F is a straight block supported at its ends, as shown in Figs. 11 and 18, by the ends of the molding machine.

The construction of the connecting walls is shown in Figs. 12, 13 and 14 each comprising a cast piece 57 having lateral integral extensions 58 at its ends. To these lateral extensions, angle bars 59 are riveted at 60, the latter being connected by bars 61 for the purpose of providing a rigid rectangular frame. To the casting 57, a narrow strip of sheet metal 62 is secured in order to space the sheet metal plate 63 from the angle bars 59, said plate 63 being secured at one edge only to the casting 57 and having its upper and lower edges 64 turned outwardly over the frame. The other frame of this connecting mold wall is U-shaped and embodies a casting 65 having integral extensions 66 at its ends to which bars or arms 67 are riveted, said bars being adjustably connected to the angle bars 59 of the other frame by means of bolts 68 which are adapted to be introduced in any one of the openings 69 formed in the bars 67 to hold the latter and the angle bars 59 together. The angle bars 59 are provided with slots 70 through which the bolts 68 work. The bolt opening 69 provides a rough adjustment between the two frames while the slots 70 provide for a finer adjustment. The U-shaped frame formed by the casting 65 and the arm 67, has a sheet metal plate 71 secured thereto, and said plate and the bars 67 operate between the plate 62 and the angle bars 59. A cross piece 72 connects the brace piece 61 and bears against the sheet metal plates to brace them at their overlapped portions. The casting 57 may be provided with integral depending pintles 42 to engage within the eyes 41 on one of the molding machines, whereas the frame piece 65 may carry a slide 44 with depending pintles 43 which interlock with the eyes 41 on the other molding machine.

In the embodiment of the invention shown in Fig. 5, the connection between the molding machines comprise two angular mold walls A and B and a core piece C. The mold wall A is shown in perspective in Fig. 6 and one member of this wall is illustrated in detail in Figs. 15. 16 and 17.

The wall A embodies two members hinged together at 24 and as each member is substantially a duplicate of the other, their common parts will be described with like reference characters. Each embodies a hinging member 25 in the form of a cast metal strip with laterally extending lugs forming the hinged connection 24. Short pieces 26 are riveted or otherwise secured at 27 to the ends of the strip 25 in order to extend laterally in the same direction from said strip, and to the outer faces of these short pieces angled bars or strips 28 are secured and extend in parallel direction, being connected at their outer ends by a strip 29 through the medium of bolts 30 thus forming a rectangular frame. Connecting the laterally extending pieces 26 is a strip of sheet metal 31 to the inner face of which is secured a sheet metal plate 32, the latter lying in spaced relation to the angled pieces 28 for a purpose which will be hereinafter described, its horizontal edges being turned outwardly at 33 to close up said space against the entrance of cement.

For coöperating with the frame section just described, another section is employed comprising a cast metal piece 34 having integral lateral extensions 35 at its ends formed with seats on their inner faces for the reception of bars 36. The latter are connected by a sheet metal plate 37 turned outwardly along its upper and lower edges at 38, said plate and bars operating in the space between the plate 32 and the angle bars 28 in order to lengthen and shorten the members of the mold wall A. To hold the two frame pieces in their relatively adjusted positions, the bars 36 are provided with openings 39 along their lengths for the reception of the bolts 30 which pass through the connecting piece 29, angle piece 28 and

the bars 36. The bar 29 carries on its inner face a cross piece 40 which extends from opposite sides of said bar 29 to coöperate with the outer face of the plate 37 and in this way tend to strengthen said plate and the plate 32 against outward pressure.

In order to detachably connect the mold wall A with two molding machines, interlocking connections are provided between said wall A and the two molding machines. In this instance, the molding machines are provided at each end of each of its walls 1, 2, 3 and 4 with perforated lugs or ears 41 which are preferably cast integrally with the frame pieces 9, 10, 11 and 12, these lugs being horizontally arranged in pairs the members of which are vertically one above the other and are located so as not to interfere with the molding faces of said walls 1, 2, 3 and 4. The mold wall A has one of its hinged members provided with two depending pintles or lugs 42, one arranged above and in alinement with the other so that they may pass through a pair of ears on one of the face-forming members 1 or 4 of a molding machine. The other hinged part of the wall A carries two depending lugs or projections 43 which are connected together by a slide 44 movably mounted on the frame piece 34 and guided in perforated ears 45. These ears guide the slide 44 and, at the same time, prevent strain on the bolts which secure the slide 44 to the frame. These depending projections 43 are adapted, after the projections 42 have been connected to one molding machine, to be connected with the pair of ears 41 on another molding machine as shown in Fig. 5 of the drawing in order to tie the two machines together.

The mold wall B of Fig. 5 is shown in detail in Fig. 9 and embodies two parts or members hinged together at 24. These two parts are substantially the same so that their common features may have common reference characters. Each embodies a sheet metal plate 46 having flanges 47 turned outwardly along its upper and lower edges. Secured to said piece by rivets 48 are two metal strips 49, said strips being located in proximity to and parallel with the flanges 47. These strips are provided with screw threaded openings near their opposite ends for the reception of bolts 50 which serve to detachably secure the frame pieces 51 and 52 to the cross strips 49. The strips 51 have integral ears forming the hinge 24 while the strips 52 carry the devices for interlocking with the molding machine, said devices being the same as those shown and described with reference to the wall A. The strips 52 have, at opposite or upper and lower ends, lateral extensions 53 which are formed with slots 54 in which the bolts 50 operate in order that the mold wall B may be adjusted slightly to vary its effective length. In fact, one connection may be made longer than the other in order to vary the angle at which the two molding machines lie. By having the pieces 51 and 52 detachably connected to the pieces 49, it is possible to substitute sheet metal molding faces 46 of other widths. This also saves the cost of repair of the machine as a stock of the several parts may be kept on hand to be replaced when broken instead of requiring the purchase of an entirely new mold wall. The mold wall B may also be used for positioning two machines as shown in Fig. 7, in which instance only a differently formed core-piece D is used therewith.

The core piece C and in fact the core piece D and others used to effect the illustrated and other combinations are preferably in the form of pieces of wood shaped to produce the desired air space and having plates 55 secured thereto (see Figs. 11 and 18) and projecting beyond the ends thereof to rest upon the shoulders formed by the upper surfaces of the ears 41 on the frame pieces 10 and 11, thus supporting the core piece between two machines.

From the foregoing it will be seen that there has been provided connecting mold walls which will permit the formation of a molding space between the ends of two molding machines. These walls may be of different formation in order that walls of different forms may be built. They are connected to the machines in such a manner that they may be readily attached or detached and may be removed without injury to the wall while the latter is in a moist condition, this being due to the swinging movement of the mold wall upon one of the molding machines and its interlocking connection with the other. The angular connecting walls are formed with a hinged joint at their angle in order that the mold wall will clear the building wall corner without injury thereto. Each connecting wall is of novel construction and designed for the purpose of obtaining lightness, durability, strength and adjustability. The hinged connection between the two members of the angular connecting wall, when taken in connection with the adjustability of the two members, thereof permits two molding machines to be held at various angles to each other and in this way bay windows of various forms may be obtained.

The connecting mold walls act as extensions of the outer mold walls or face forming members of each machine or apparatus and project beyond the connecting slides and beyond the inner mold walls to form a space at one end of the machine beyond the inner mold walls and said connecting slides, the core member lying in said space and forming a continuation of the inner walls.

What I claim as my invention and desire to secure by Letters Patent is:

1. In combination in a concrete mold, a pair of outer walls, a pair of inner walls adapted to form an air space between the outer walls, connecting means between the inner and outer walls, arranged above said walls, extensions carried by the outer walls and projecting beyond said connecting means and beyond the inner walls, to form a space at one end of the mold beyond the inner walls and said connection, and a core extending parallel with the inner walls within the space between the extensions.

2. In combination in a concrete mold, a pair of outer walls, a pair of inner walls adapted to form an air space between the outer walls, connecting means between the inner and outer walls arranged above said walls, extensions carried by the outer walls and projecting beyond said connecting means and beyond the inner walls, to form a space at one end of the mold beyond the inner walls and said connection, and a core extending parallel with the inner walls within the space between the extensions, one at least of said extensions being hinged to swing relatively to the outer wall which carries it.

3. In combination in a concrete mold, a pair of outer walls, a pair of inner walls adapted to form an air space between the outer walls, connecting means between the inner and outer walls arranged above said walls, extensions carried by the outer walls and projecting beyond said connecting means and beyond the inner walls, to form a space at one end of the mold beyond the inner walls and said connection, and a core extending parallel with the inner walls within the space between the extensions, said extensions being detachably secured to the outer walls.

4. A concrete mold comprising a plurality of pairs of mold boards spaced apart from each other to provide an air space between the walls to be formed, the boards of each pair being spaced apart to receive concrete between them, a frame for supporting said mold boards, extensions carried by said outer mold boards projecting, at one end of the mold beyond the ends of the inner mold boards for the purpose of forming a rectangular space at one end of the mold, and a solid block detachably connected to said mold to extend longitudinally of said mold between and parallel with the extension on the outer mold boards, and acting to form a continuation of the inner mold boards.

5. In combination in a concrete mold, a pair of outer walls of equal lengths, a pair of inner walls of equal lengths arranged to form an air space between the outer walls, connecting frames between said walls, means detachably secured to said outer walls for forming a mold chamber beyond the ends of the inner walls, and beyond the connecting frames, and a removable core member for coöperating at one end with the inner walls to form an air space in continuation of the air space formed by the inner walls.

6. In combination in a concrete mold, a pair of outer walls of equal lengths, a pair of inner walls of equal lengths arranged to form an air space between the outer walls, connecting frames between said walls, means detachably secured to said outer walls for forming a mold chamber beyond the ends of the inner walls, and beyond the connecting frames and a removable core member for coöperating at one end with the inner walls to form an air space in continuation of the air space formed by the inner walls, said core member extending parallel with said inner walls.

7. The combination with two molding apparatus each having a pair of outer walls, a pair of inner walls between the outer walls to form an air space, and means for connecting said walls to permit a relative movement between the outer walls and a relative movement between the inner walls, of mold walls detachably connected to the outer walls of the two apparatus to form a mold chamber between the two apparatus.

8. The combination with two molding apparatus each having a pair of outer walls, a pair of inner walls between the outer walls to form an air space and means for connecting said walls to permit a relative movement between the outer walls and a relative movement between the inner walls, of mold walls detachably connected to the outer walls of the two apparatus to form a mold chamber between the two apparatus and a core member detachably supported at its ends on the two inner mold walls.

9. The combination with two molding apparatus, each having a pair of outer walls, a pair of inner walls between the outer walls to form an air space, and means connecting said walls to permit a relative movement between the outer walls and a relative movement between the inner walls, of an angular mold wall detachably connected to an outer mold wall on each of said apparatus to form an angular mold space between the apparatus.

10. The combination with two molding apparatus, each having a pair of outer walls, a pair of inner walls between the outer walls to form an air space, and means connecting said walls to permit a relative movement between the outer walls and a relative movement between the inner walls, of a mold wall connecting an outer mold wall on one apparatus with an outer mold wall on the other apparatus, and devices permitting said mold wall to be detached from one of said outer

walls and to swing outwardly on the other outer mold wall.

11. The combination with two molding apparatus, each having a pair of outer walls, a pair of inner walls between the outer walls to form an air space, and means connecting said walls to permit a relative movement between the outer walls and a relative movement between the inner walls, of a mold wall connecting an outer mold wall on one apparatus with an outer mold wall on the other apparatus, and devices permitting said mold wall to be detached from one of said outer walls and to swing outwardly on the other outer mold wall, said devices comprising perforated ears on the outer walls of the molding apparatus and projections at the ends of the swinging wall, the projections at the swinging end of said wall being movable on the wall to connect and disconnect with the perforated ears.

12. A mold wall comprising two frames having arms adjustably connected, a sheet of metal secured near one side of one frame and spaced apart from the arms of said frame to provide a space through which the arms of the other frame may operate, a sheet of metal secured to the other frame, the two sheets overlapping, a connecting piece between the arms of the first named frame, and a bracing strip extending transversely of said connecting piece and cooperating with the overlapping sheet metal plates in order to brace the latter.

13. The combination with two molding apparatus each having a pair of outer mold walls, a pair of inner walls between the outer walls to form an air space, and means connecting said walls to permit a relative movement between the outer walls and a relative movement between the inner walls, of an angular mold wall detachably connected to an outer mold wall of each apparatus to form an angular space between the apparatus, said mold wall having a hinged joint at its corner permitting the angle of said wall to be changed.

14. An extensible wall for molds comprising a casting having a laterally turned extension at its ends, angle bars secured to the outer faces of said laterally turned extensions, a sheet metal plate secured to the casting at one edge, a U-shaped frame having its arms adjustably connected to the angle bars between the latter and the sheet metal plate, a sheet metal plate secured to the U-shaped frame and overlapping the sheet metal plate on the other frame, a connecting piece between the free ends of the angle bars, and a cross piece carried by the connecting piece and serving to support the sheet metal plate at their overlapped portions.

15. An extensible wall for molds comprising a rectangular frame carrying a cross piece on one of the arms thereof, a U-shaped frame adjustable on two other arms of the rectangular frame, two sheet metal plates, each secured to one of the frames and one passing between the other plate and the frame which carries said other plate so that said plates overlap, the cross piece bracing the overlapped portions.

16. A mold comprising a pair of cooperating slides, a pair of face forming members having L-shaped frames at their ends secured to the slides, the opposed faces of the frames and the slides being grooved, keys arranged in said grooves to bridge the joints between the extensions and the slides and bolts for securing the extensions to the slides.

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