March 15, 1932. G. W. HELLER 1,849,758

WALL MOLD

Filed Sept. 23, 1929 2 Sheets-Sheet 1

Fig. 1.

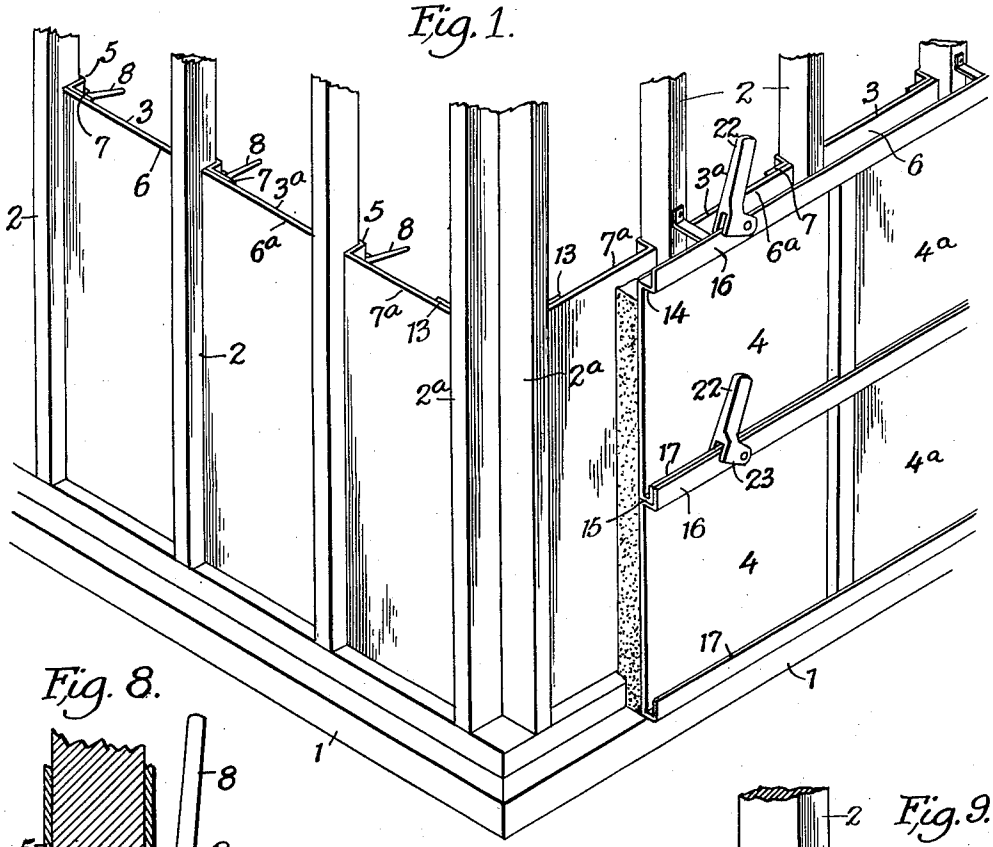


Fig. 8.

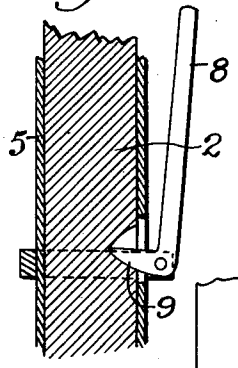


Fig. 2

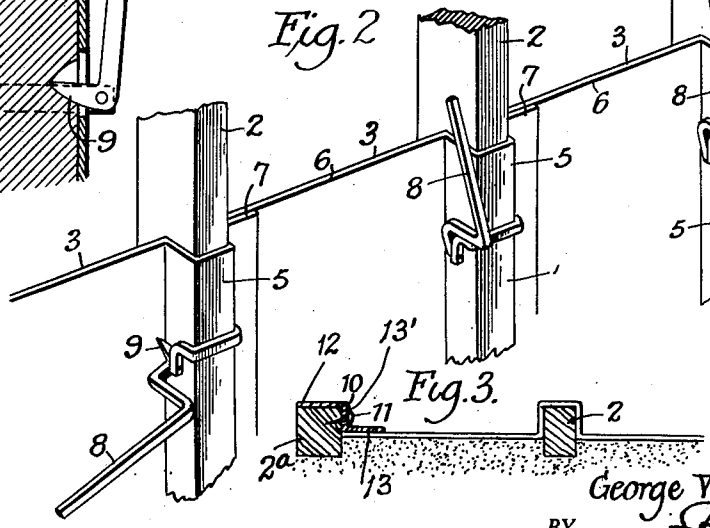
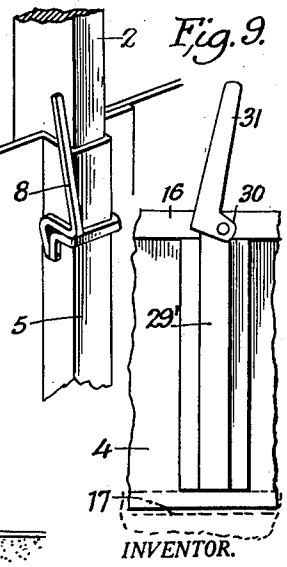


Fig. 3.

Fig. 9.



INVENTOR.

George W. Heller

BY

Paul S. Schilling

ATTORNEY.

March 15, 1932. G. W. HELLER 1,849,758

WALL MOLD

Filed Sept. 23, 1929 2 Sheets-Sheet 2

Fig. 4.

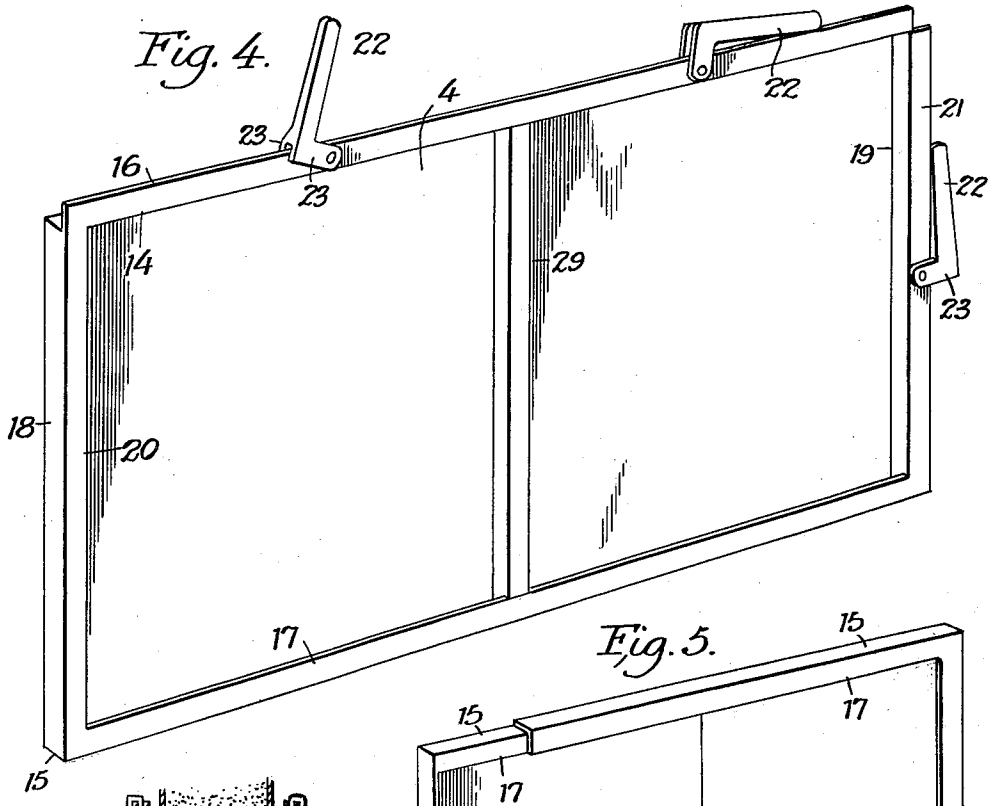


Fig. 5.

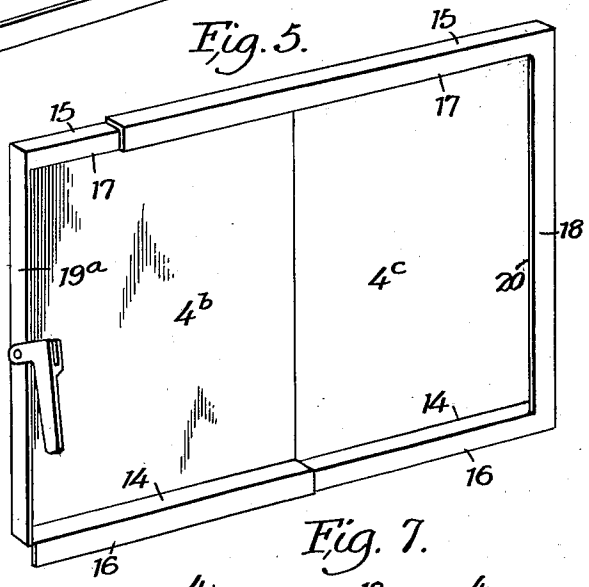


Fig. 10.

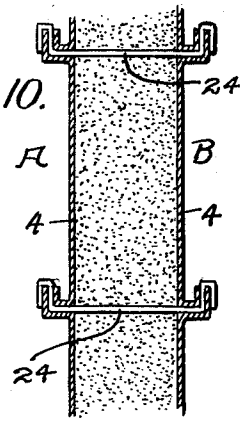


Fig. 7.

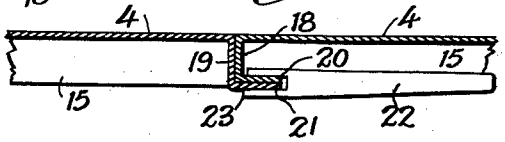
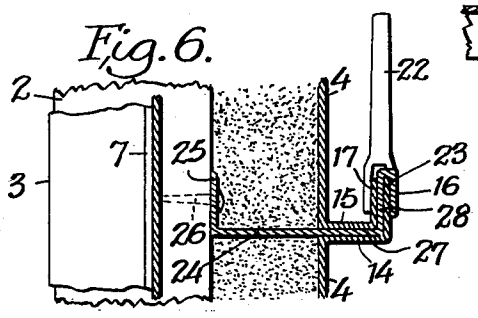


Fig. 6.



INVENTOR.
George W. Heller,
BY
ATTORNEY.

Patented Mar. 15, 1932 1,849,758

UNITED STATES PATENT OFFICE

GEORGE W. HELLER, OF CAMDEN, NEW JERSEY

WALL MOLD

Application filed September 23, 1929. Serial No. 394,510.

This invention relates to molds for the erection in situ of walls of concrete or other plastic materials.

One object of the invention is to provide inner and outer mold plates for the formation of inner and outer mold walls between which the wall of concrete is molded, which wall plates are designed to be supported by studs of a permanent framing about which the concrete wall is formed and to be detachably connected and arranged in horizontal zones or courses, so that a portion of the wall up to a certain height or level may be formed and the plates removed as soon as such wall portion is set and applied for use at a higher level, thus obviating the necessity of erecting the mold walls to any great height at one time and thereby reducing the number of mold plates necessary for use in forming a wall.

A further object of the invention is to provide mold plates and members which may be easily and quickly set up for use and taken down after use; which may be employed for molding a wall of any desired length, height and thickness; which provides inner wall plates which are secured directly to the studding and which, on removal, will leave a proper space between the studs and formed outer wall for the attachment of plaster board or lathing and plastering to the studs to form an inner wall and an intervening air space; and which embodies means for spacing the inner and outer wall molds from each other, which means may be left, if desired, to form retainers for a finishing coat.

A still further object of the invention is to provide outer wall forming plates which, in the formation of a wall where studs are not present, may be employed to form both inner and outer wall forming members which may be connected and detachably held in working position by the retainer-forming spacing means above referred to.

With these and other objects in view, the invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Fig. 1 is a perspective view, looking from the outer side, of a framing for walls meeting at a corner angle and showing how some of the inner and outer mold plates are set up for use.

Fig. 2 is a similar view looking toward the inner side of the framing and showing fragmentarily some of the inner mold plates arranged for use.

Fig. 3 is a sectional plan view showing the inner mold plates as designed for application to an end or corner stud and an adjacent row stud.

Fig. 4 is a perspective view of an outer mold plate.

Fig. 5 is a similar view of a telescopic mold plate.

Fig. 6 is a vertical section showing how a cross-tie is connected to outer mold plates.

Fig. 7 is a sectional plan view showing the fastening connection between dissimilar ends of two outer mold plates.

Fig. 8 is a sectional view showing the means for fastening an inner mold plate to a stud.

Fig. 9 is a fragmentary outer side view of an outer mold plate showing the use of an auxiliary brace.

Fig. 10 is a view showing the use of the "outer" mold plates disclosed in conjunction with cross-tie strips for forming both the inner and the outer mold walls where, for example, studs of a wall framing are not present.

Referring now more particularly to the drawings, 1 designates the sills and 2, 2^a the studs or uprights of a wall framing, in the spaces between and on the outer sides of which uprights an outer wall of concrete or the like is to be molded. Inner and outer wall forming mold plates 3, 3^a and 4, 4^a, respectively, are provided for this purpose.

Each inner wall forming mold plate 3 comprises a sheet metal body of a suitable height and of a width substantially equal to the distance between adjacent studs. Said plate is formed between its vertical center and one of its side edges with a U-shaped channeled portion 5 to embrace substantially the inner half of a stud 2, so as to dispose an applied plate in such manner that its long and short

wings or portions 6 and 7, arranged on opposite sides of the channel, will lie outwardly beyond the plane of the inner faces of the framing studs and in the spaces between the stud engaged by its channel and the adjacent studs on opposite sides thereof. The arrangement is such that the short and long wings of each plate respectively engage the long and short wings of adjacent plates 3 or 3ª on opposite sides thereof, so that a row or series of the plates engaging the spaced studs, arranged in a horizontal row or course, and with their wings overlapping each other at the joints, will close the spaces between the studs for a vertical height or distance equal to the depth or height of the plates. The channeled portions 5 of the respective plates 3 are provided with fastening means for holding them detachably engaged with the studs. In the present instance, a fastening device is mounted on each channeled portion 5 and comprises a lever-like clamping member 8 having a spur 9 at one end movable through an opening in the channeled portion to engage the stud 2, as shown particularly in Figs. 2 and 8, by means of which each plate 3 may be firmly secured in position for the molding operation and removed when the molding operation is completed. Each mold plate 3ª is similar in construction to the mold plates 3 but is provided with wings 6ª and 7ª of equal lengths, or of sufficient length to extend in opposite directions beyond the stud 2 engaged by its channeled portion 5 and adjacent studs at opposite sides of said engaged stud for the purpose of meeting certain conditions, as when the stud 2 engaged by the channeled portion of the plate is arranged adjacent to a corner stud 2ª, as illustrated in Fig. 3. In other words, the wing 7ª of plate 3ª, is prolonged as compared with wing 7 of a plate 3, in order to extend the full distance between the intermediate row stud and the corner stud in view of the fact that a plate with a channel 5 can not be used to engage a corner stud and a special corner plate 10 must be provided for this purpose. This corner plate is substantially Z-shaped, or comprises a body part 11 adapted to lie against one side of the post 2ª and having oppositely extending flanges 12 and 13 to respectively bear against the inner face of the post and the adjacent end of the wing 7ª of the coacting mold plate 3ª. In each instance where a corner angle plate 10 is used it may be secured to the post 2ª by nails or other suitable fastenings 13′ which may be withdrawn to permit of the removal of the plate 10 at the end of a filling operation.

The outer wall forming plates 4 are of a length conforming to the distance between two or more studs 2 and 2ª and preferably of a depth or height equal to one-half the depth or height of the inner plates 3 and 3ª, so that two horizontal rows or courses of the plates 4 will be equal in depth to one row or course of the plates 3, 3ª, but, while this relative dimensioning of the plates is preferred, the outer wall plates may, if desired, be made of the same depth or height as the inner wall plates. Each outer wall plate 4 is, as shown, of oblong rectangular form and comprises a body portion provided with outturned longitudinal upper and lower edges 14 and 15, provided respectively with flanges 16 and 17, the former projecting upwardly from the edge 14 parallel with the body plate and the latter projecting upwardly from the edge 15 parallel with the body plate and lying opposite the same. Each plate 4 is also provided with outwardly turned end edges 18 and 19, respectively provided with flanges 20 and 21, the former projecting inwardly parallel with the plate body and the later projecting outwardly parallel with the plate body, as clearly shown in Fig. 7. This construction provides a shallow tray-like form of mold plate bounded by reinforcing marginal edges, and which, by the described arrangement of the flanges 17 and 20 is channeled or trough-shaped at one of its longitudinal edges and one of its end edges and provided with projecting flanges 16 and 21 at its remaining edges. This construction adapts the plates 4 to be mounted in superposed relation with the flanged edge 15 of one plate resting upon the flanged edge 14 of the underlying plate, so that the flanges 17 and 16 of the respective plates lie in abutting and parallel relationship, and so that the flanged end 18 of one plate 4 may lie in contact with the flanged end 19 of an adjacent plate in the same horizontal row or course with their flanges 20 and 21 abutting and overlapping as shown particularly in Fig. 7. The construction is therefore such that when two or more rows or courses of the marginally reinforced and flanged mold plates 4 are set up the reinforced portions of the plate will provide abutment surfaces to adequately support and reinforce the plates from one another with their lapping flanges so disposed as to permit of a ready and convenient fastening connection of the plates with one another.

For the purpose of joining the longitudinal and transverse edges of adjacent mold plates 4, each mold plate 4 may be provided upon its flanges 16 and 21 with pivoted clamps 22 having clamping jaws 23, whereby the lapping flanges 16 and 17 of superposed mold plates and the lapping flanges 20 and 21 of mold plates in abutting relation, may be clamped together, as illustrated in Figs. 6 and 7.

For the purpose of holding the outer wall mold formed by the plates 4 in spaced relation to the inner mold wall formed by the plates 3, 3ª, as well as to prevent any pos-

sibility of outward displacement of the outer mold wall, cross-ties 24 are provided for connecting the outer mold wall at points with the studs 2 and 2^a. Each of these cross-ties consists, as shown particularly in Fig. 6, of a metallic strip having a bent end 25 perforated for passage of a fastening nail 26 to secure it to a stud 2 or 2^a and having its opposite or free end normally bent in L-formation, as at 27, so as to be disposed to lie between the ends 14 and 15 of superposed mold plates 4 and between the flanges 16 and 17 thereof and then to be bent, after engagement therewith to form a retaining tongue 28, so that when the flanges 16 and 17 are engaged and held by the clamps 22 the cross-ties and mold plates 4 will be firmly united. When the mold plates are later taken down or disassembled, the bodies of the cross-ties 24 will be invested by the concrete which has been filled in between the mold walls to form the outer building wall, leaving the bent ends of the cross-ties projecting, which may thereupon be cut off or allowed to remain for use as retainers in case a finishing coating of any kind is applied upon the outer surface of the molded building wall.

From the foregoing it will be understood that, in erecting a building wall in which framing studs are provided, it is only necessary to set up the inner and outer mold plates, which will be supported by the studding and initially by the frame sills and later by the wall as erected, so that it is only necessary to erect the mold walls initially to a certain level, after which the concrete may be filled in to form the building wall up to such level, and upon the setting of the concrete, the molds may be removed and placed at a higher level to form another portion of the wall, and this procedure may be followed, for the erection of the molded wall in steps, or until said wall is completed. This obviates the necessity of setting up mold walls to the full height to which the building wall is to be erected, or setting up the mold walls to any very great height, which is objectionable for many reasons, among them the liability of bulging of the mold walls and imperfect formation of the building wall, and the number of molds and amount of material required in the erection of a building wall. All these disadvantages are overcome by means of my improved construction of mold plates, whereby the number of mold plates required for use at any time is reduced to the minimum, and a step by step operation of erecting the building wall permitted, with resulting convenience and economy in carrying on the work.

It is to be understood, of course, that the mold plates are made of sheet or cast metal, preferably sheet metal, of a desired gage to secure the requisite stiffness, and that, wherever end or corner posts are encountered the inner mold plates 3^a and angle plates 10 are employed. Also in adapting an outer wall mold to be erected so that mold wall plates will properly meet at corner angles, as well as to provide for variations in the spacing between studs, mold plates or sections 4^a as shown in Fig. 5 are employed. These mold plates or sections 4^a conform generally in construction with the mold plates or sections 4, except that each mold plate 4^a is composed of sections 4^b and 4^c which are slidably or telescopically connected, so that a mold plate of less or greater length than normal may be provided whenever necessary.

The mold plates 4 and 4^a may be suitably reinforced. In the present instance I have shown the mold plates 4 provided each with a vertical transverse reinforcement 29, rigid with the plate and secured in any suitable manner to the plate body and edges 14 and 15. In order to provide means for similarly bracing the mold plates 4^a when properly adjusted for use, or for additionally bracing any mold plate 4 when necessary, an auxiliary reinforcement 29′ may be used and fitted for use between the edges 14 and 15 of a mold plate. Auxiliary brace 29′ is provided at one end with an extension 30 carrying a clamp 31 which may be similar in construction to the clamps 22. With this construction the brace 29′ may be fitted at one end in the channeled longitudinal portion of a mold plate so as to be retained from displacement by the flange 17, with its extension 30 lying parallel with the flange 16 of the mold plate, so that the lever 31 may be employed to connect said extension 30 with the flange 16 of the mold plate for detachably holding the auxiliary brace in position.

In case a concrete wall is to be formed where there is no frame studding for supporting the molds, both the inner and the outer mold walls A, B, respectively, as shown in Fig. 10, may be formed of connected "outer" mold plates 4, which may be connected and maintained in spaced relation during the molding operation by means of cross-ties 24 of the type previously described. Where concrete walls are to be formed some of which will encase a stud-framing and some not, a combination of the two mold forming arrangements of different mold plates may be used, as will be readily understood.

While the structure disclosed is preferred, it will, of course, be understood that various changes in the form, construction and arrangement of parts may be made within the scope of the invention as defined in the appended claims, without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described my invention, I claim:—

1. In a wall mold, mold plates each having outturned longitudinal and transverse edges, one longitudinal and one transverse

edge having outwardly extending flanges and one longitudinal and one transverse edge having inwardly extending flanges, a detachable brace disposed between the longitudinal edges of the plates and held at one end by the inturned longitudinal edge of the plate, a clamp for connecting the brace to the opposite outturned longitudinal edge of the plate, and means for connecting the outwardly extending flanges of a plate to the inwardly extending flanges of adjacent plates.

2. In a mold for forming a wall between and outwardly beyond upright frame studs, inner wall plates adapted to be secured to the studs, outer wall plates arranged outwardly beyond the studs and having abutting outturned edges provided with flanges, cross-ties secured at one end to the studs and having their opposite ends bent at an angle between the outturned edges and flanges of the outer wall plates, and clamping means uniting the flanged edges of the plates and holding the bent edges of the cross-ties therebetween.

3. In a wall mold, a mold plate having a channeled portion and wings at opposite sides thereof, said channeled portion being formed to embrace a face and opposite sides of a wall forming stud, and having an opening therein, and a fastening member pivotally mounted on said channeled portion of the mold plate and provided with a spur projectible through said opening to enter the stud and fasten the mold plate thereto.

In testimony whereof I affix my signature.

GEORGE W. HELLER.