

C. DIETRICH.
 APPARATUS FOR BUILDING CONCRETE STRUCTURES.
 APPLICATION FILED APR. 2, 1912. RENEWED DEC. 1, 1919.

1,361,315.

Patented Dec. 7, 1920.

Fig. 1.

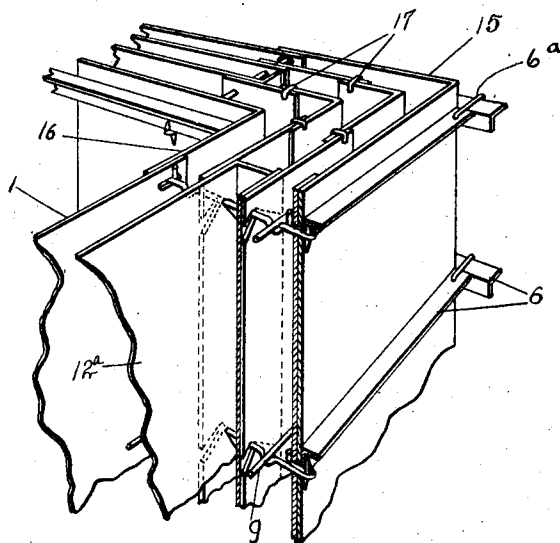


Fig. 2.

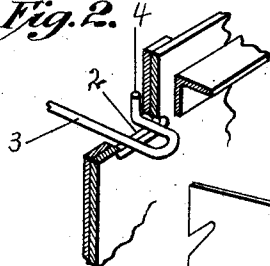


Fig. 3.

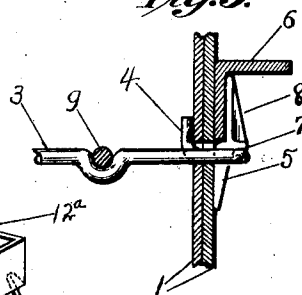


Fig. 4.

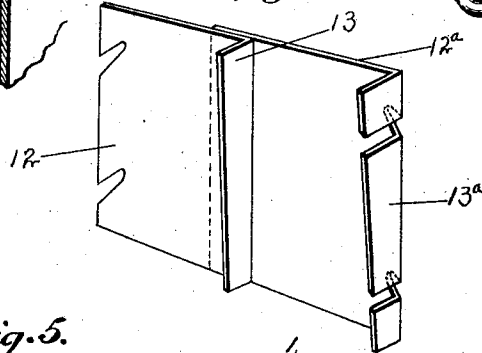
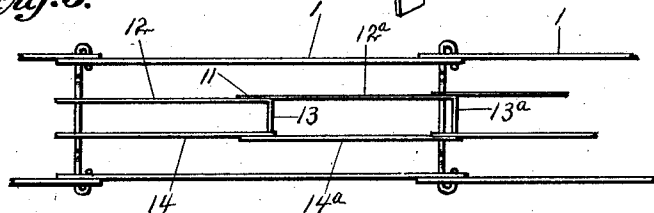


Fig. 5.



Test:
G. M. Taylor

Inventor:
 Charles Dietrich
 by *W. B. Morton*, his Atty

UNITED STATES PATENT OFFICE.

CHARLES DIETRICH, OF LITTLE FERRY, NEW JERSEY.

APPARATUS FOR BUILDING CONCRETE STRUCTURES.

1,361,315.

Specification of Letters Patent.

Patented Dec. 7, 1920.

Application filed April 2, 1912, Serial No. 688,069. Renewed December 1, 1919. Serial No. 341,720½.

To all whom it may concern:

Be it known that I, CHARLES DIETRICH, a citizen of the United States, residing at Little Ferry, New Jersey, have invented certain new and useful Improvements in Apparatus for Building Concrete Structures, of which the following is a specification.

This invention relates to apparatus for building concrete structures and more particularly to apparatus for building walls such as the walls of houses.

One object of the invention is the provision of an apparatus which may be repeatedly handled in the building of concrete walls and the like and which forms when in service a chamber or mold into which the concrete may be poured and allowed to set.

A further object of the invention is to provide an apparatus of the class described which is composed of a minimum number of parts and is free from complicated joints and fastening so as to be readily and rapidly assembled and disassembled.

A further object of the invention is to provide an apparatus of the character described which is composed for the most part of "stock" materials, such as flat sheet metal, angle iron, etc., and requires few specially shaped parts, thereby materially reducing the cost of manufacture.

Further objects of the invention will appear in the following description, when read in connection with the accompanying drawings, and from the appended claims. In the said drawings I have illustrated a preferred embodiment of the invention but it is to be understood that the invention is not limited to the exact construction therein shown, but includes all such modifications thereof as properly fall within the scope of the said claims.

In the drawings:

Figure 1 is a perspective view of the apparatus employed in the construction of a corner of a hollow wall.

Figs. 2, 3, and 4 are detail views of portions of the apparatus which will be hereinafter described, and

Fig. 5 is a diagrammatic plan view showing the relative arrangement of the mold sections for a straight wall.

Referring now to the drawings in which like characters designate corresponding parts throughout the several views, 1 designates the plates forming the outer walls of the mold which plates preferably consist of

flat metal sheets of suitable gage and may be of a length equal to the desired height of the wall to be built. The plates 1 may be of any convenient width and are arranged to conform to the pattern of the wall to be built with their adjacent edges lapped as shown in Fig. 5. At suitable intervals vertically of the plates their lapped edges are provided with registering holes 2 through which the looped ends of the tie rods 3 project. These rods which may be formed of heavy wire have their ends which are bent back to form the loops turned up at right angles to the loops to form stops to engage the inner faces of the plates, as shown at 4. The loops thus formed project through the plates a sufficient distance to receive a fastening wedge 5, which when driven in place, tightly clamps the plates between the stops 4 and the wedges, thereby rigidly supporting and maintaining the outer wall sections at a fixed distance apart throughout.

In order to prevent the mold sections bulging outward with the weight of the concrete, the wedges 5 are shaped to provide supports for angle iron braces 6 which extend horizontally around the mold as shown in Fig. 1. As here shown the wedges are formed with shoulders 7 which rest on the loops of the rods 3 and with upward extensions 8 offset from their wedge portions a distance equal to the thickness of the angle irons. The ends of the angle iron braces 6 at the external corners of the mold are connected together by a suitable fastener for instance as shown in Fig. 1, wherein a hook 6* of heavy wire is swiveled in the end of one angle and engages over the flange of the other angle, the latter angle projecting beyond the end of the first mentioned angle in the manner shown in the drawing.

If it is desired to reinforce the wall the rods 3 may be bent to form seats for the reinforcing bars 9. This construction also serves the purpose of preventing the rods 3 being loosened when the mold sections are removed from the partially set concrete.

For the construction of hollow walls which are desirable for the reason that the interior air space prevents moisture which may pass through the outer wall section from reaching the inner wall section, it is necessary to provide in the space between the outer and inner sides of the mold a pair of spaced mold members which define the

space to be left within the wall. These interior mold members need not be rigidly secured together as are the exterior mold members but must be so supported as to be easily removed when the concrete has set. In the present apparatus the internal mold members consist of metal plates of a width slightly greater than half the width of the plates forming the outer mold members so that they may be supported on the rods 3 with their adjacent edges slightly lapped as shown at 11 in Fig. 5. In order to maintain the inner mold members the proper distance apart and prevent their being displaced by the weight of the concrete, the plates 12, 12^a, which form one side of the interior air space are bent at one end to form lateral flanges 13, 13^a, respectively, which extend across the air space and abut against the lapped edges of the plates 14, 14^a, on the opposite side of the air space.

As stated above the inner mold plates are supported on the rods 3. In the present apparatus this is effected by providing the plates 12 and 14 which lie to the right of the adjacent rod 3 with upwardly inclined notches in their left vertical edges, and providing the plates 12^a and 14^a with similar notches in their right vertical edges, so that the plates may be withdrawn by merely lifting them to the right or left as the case may be. In order to prevent the edges of the flanges 13, 13^a binding against the opposite plates, the flanges are slightly tapered as shown in Fig. 4, so that when once loosened the plates may be easily lifted.

For forming a corner in a hollow wall, outer corner plates 15 and inner corner plates 16 are employed in addition to the apparatus described. The outer corner plates may be attached to the adjacent straight plates by the same means that is used for connecting the adjacent straight plates, but as the inner corner plates cannot be moved laterally in either direction on account of the concrete in the molds, they are suspended from the adjacent inner plates by means of hooks 17 attached to their upper edges as shown in Fig. 1, so that they may be withdrawn by a straight upward movement.

The apparatus for forming hollow walls has been selected for illustration in the drawings but it will of course be understood that for solid walls it is merely necessary to omit the inner mold members from the structure shown.

In using the apparatus in the construction of walls, the members are assembled in the way shown in Figs. 1 and 5, in the desired configuration. The concrete is then poured in and allowed to "set" sufficiently to retain its shape without support. The inner mold members are then removed by simply lifting them off the stay rods in the manner de-

scribed. The outer members are next removed by taking off the angle iron braces and knocking the wedges out of the loops in the ends on the stay rods. The rods themselves are not removed but are cut off at the surface and left in place to reinforce the wall.

If it be desired to build a wall of greater height than convenient for a single length of mold plates, the same plates used for the lower section of the wall may be set in place on top of the lower section to form a mold for the next section and so on until the desired height is attained. When this is done the loops are left on the stay rods at the top of the wall section and the lowest holes in the plates are slipped over these loops when the mold is assembled for the next section.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In an apparatus of the class described, the combination of a plurality of flat mold plates arranged to form two parallel walls, stay rods connecting said walls, said rods having loops projecting through said plates and shoulders engaging the inner faces of said plates, wedges in said loops for clamping said plates against said shoulders, brace bars extending longitudinally of said wall, means formed on said wedges for maintaining said brace bars in fixed relation to said plates, inner mold members and means for supporting said mold members between said external mold plates.

2. In an apparatus for constructing hollow concrete walls, the combination of external mold plates, stay rods at different points vertically in each pair of plates having means for maintaining said plates a fixed distance apart, inner mold plates arranged in parallel relation to said external plates and having inclined notches in their vertical edges engaging said stay rods and means for maintaining said inner plates a fixed distance apart.

3. In an apparatus for forming hollow concrete walls, the combination of external mold plates at different points vertically in each pair of plates, stay rods having means for maintaining said plates a fixed distance apart, and pairs of inner mold plates arranged in parallel relation to said external members, said inner plates having inclined notches in their vertical edges engaging said stay rods, and one of each pair of said inner plates having a flange along one of its vertical edges for engaging the other plate of said pair and maintaining said inner plates a fixed distance apart.

4. In an apparatus of the class described, the combination of a series of mold plates, stay rods connecting said plates and maintaining them in fixed parallel relation and spaced apart the thickness of the wall to be

built, a plurality of such rods being provided
for each pair of opposite plates, said rods
being arranged at different points vertically
in each pair of plates and at a distance from
5 the horizontal edges thereof, said rods hav-
ing loops in their ends projecting through
holes in said plates, projections on said rods
engaging the inner face of said plates, and
wedges driven in said loops and clamping
10 said plates against said projections, said
wedges being arranged in horizontal, paral-
lel rows throughout the series, and reinforc-
ing bars supported on said wedges for

strengthening the mold plates intermediate
their ends, said wedges being formed with 15
bar-engaging portions for maintaining said
bars clamped against said plates.

In testimony whereof, I have signed my
name to this specification in the presence of
two subscribing witnesses, this 12th day of 20
March, 1912.

CHARLES DIETRICH.

Witnesses:

W. B. MORTON,
G. M. TAYLOR.