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PATENTED JUNE 26, 1906.

B. A. MUELLER.
MOLD FOR CONCRETE WALL CONSTRUCTION.

APPLICATION FILED DEC. 30, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

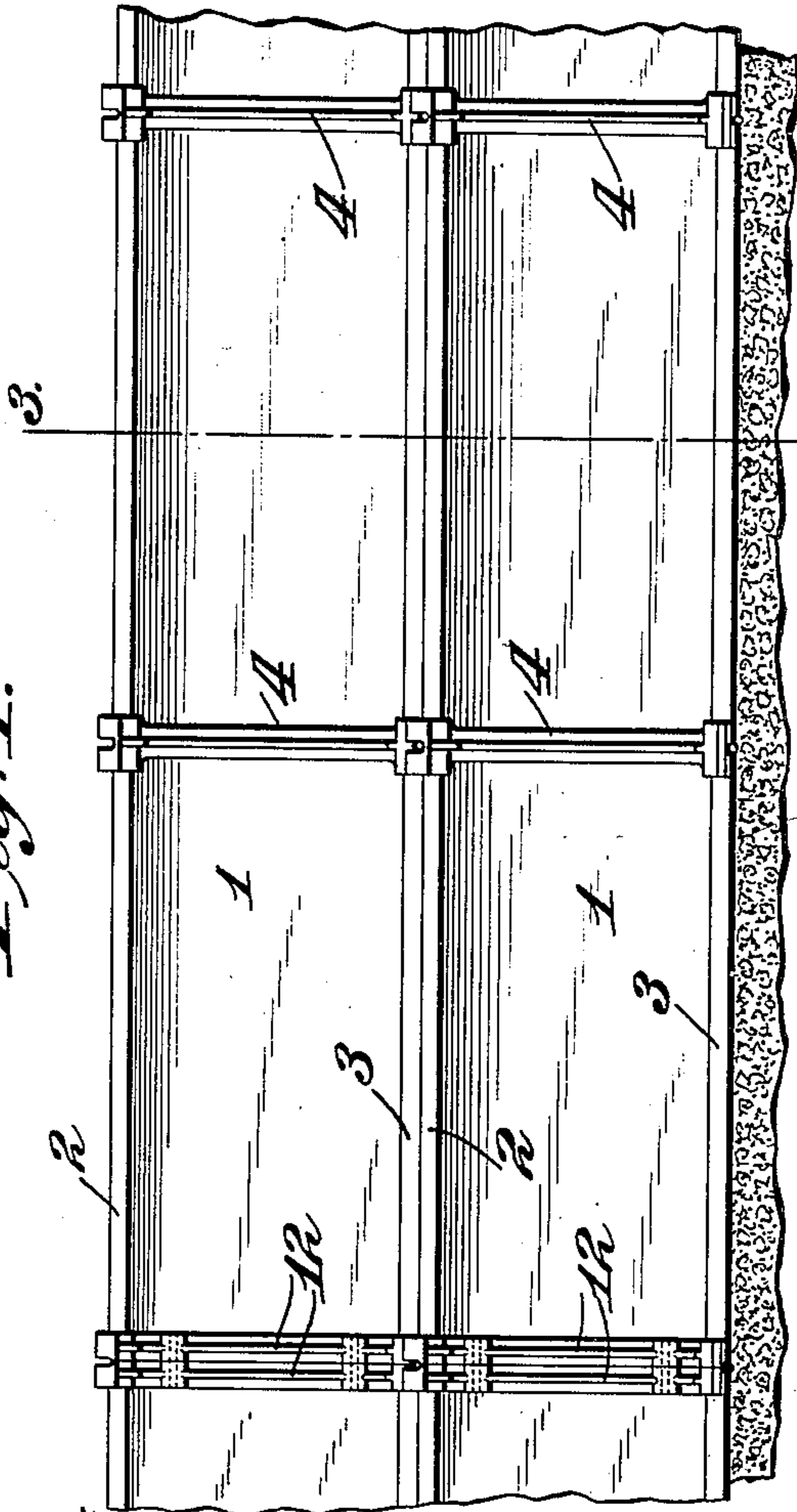


Fig. 2.

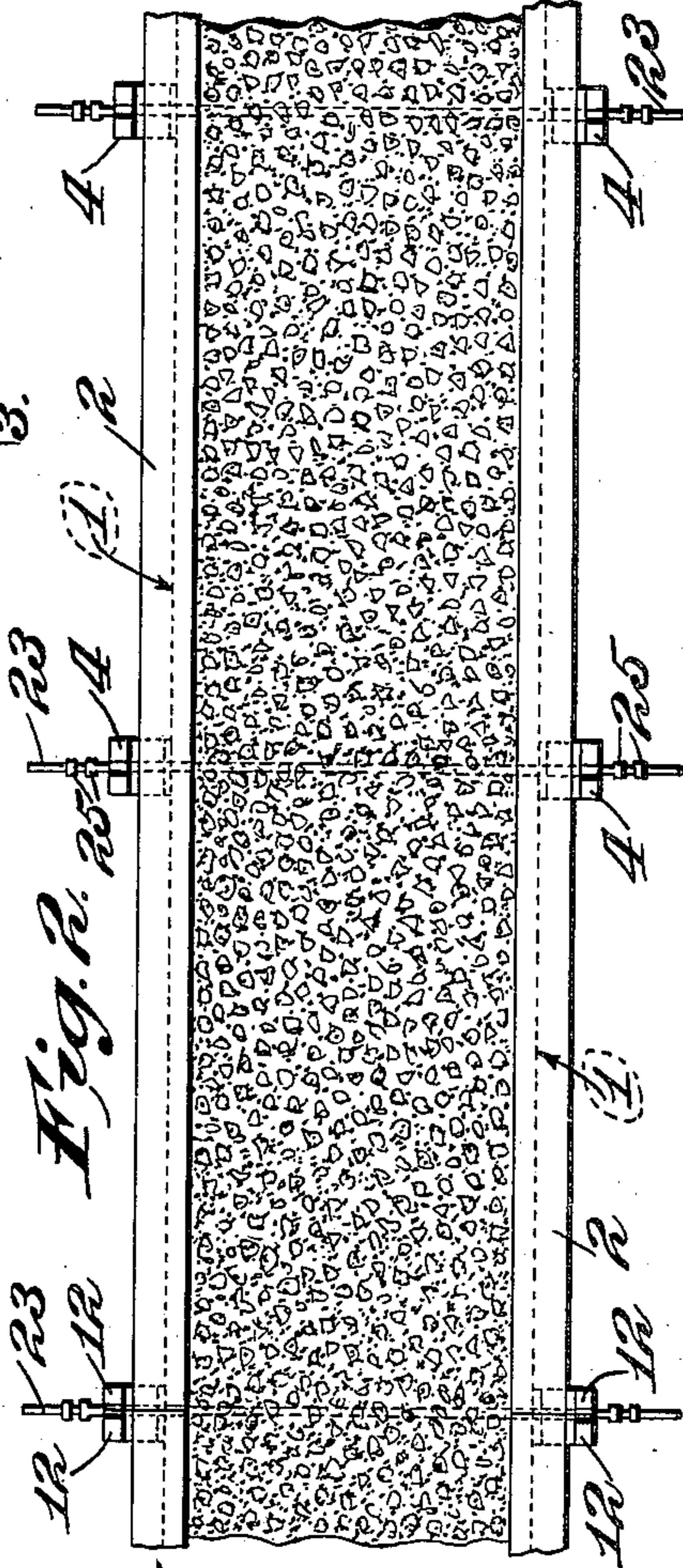
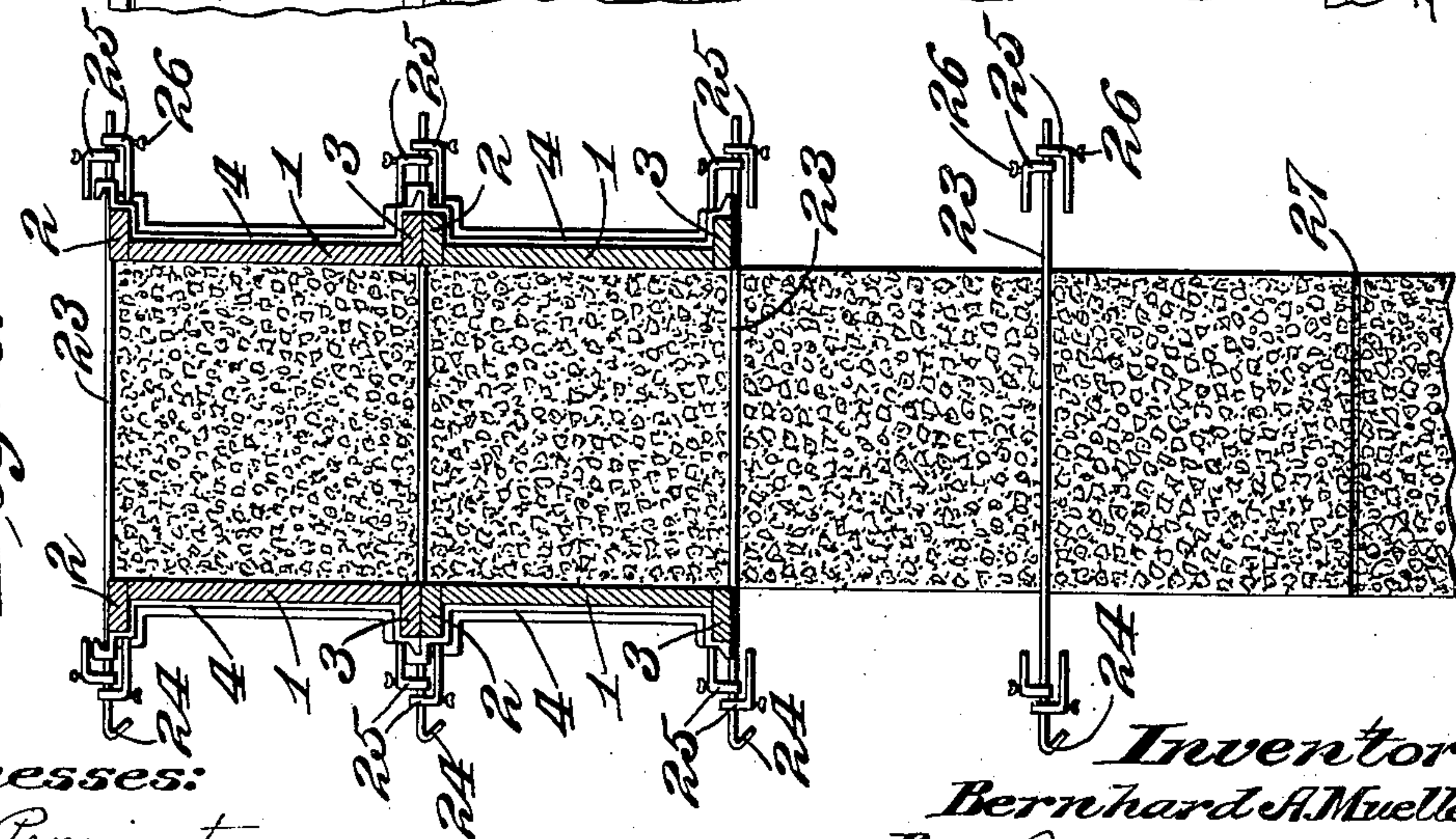


Fig. 3.



Witnesses:

G. A. Pennington
Fred P. Reimer

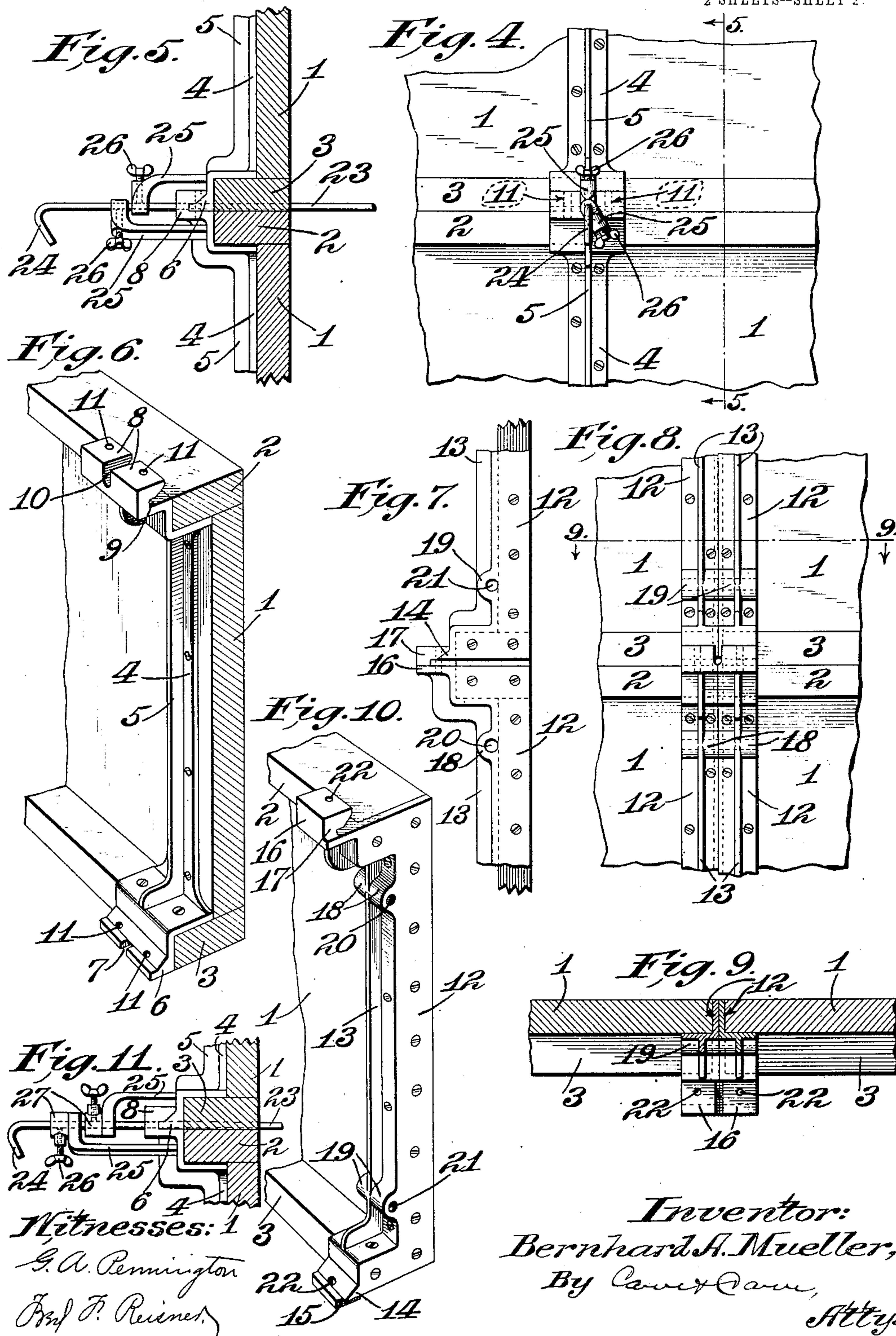
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B. A. MUELLER.

MOLD FOR CONCRETE WALL CONSTRUCTION.

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2 SHEETS--SHEET 2.



UNITED STATES PATENT OFFICE.

BERNHARD A. MUELLER, OF EAST ST. LOUIS, ILLINOIS.

MOLD FOR CONCRETE-WALL CONSTRUCTION.

No. 824,192.

Specification of Letters Patent.

Patented June 26, 1906.

Application filed December 30, 1905. Serial No. 293,883.

To all whom it may concern:

Be it known that I, BERNHARD A. MUELLER, a citizen of the United States, and a resident of East St. Louis, county of St. Clair, and State of Illinois, have invented a new and useful Improvement in Molds for Concrete-Wall Construction, of which the following is a specification.

My invention relates to molds for concrete-wall construction, and has for its principal objects to provide a mold consisting of interchangeable sections, to provide for building the mold up as the wall hardens, using for this purpose the sections of the mold upon portions of the wall which have hardened sufficiently to require no further support, to dispense with the use of scaffolding to support the molds, and other objects hereinafter more fully appearing.

My invention consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, and wherein like symbols refer to like parts wherever they occur, Figure 1 is an elevational view of the mold and a fragment of the completed portion of the wall, the tie-rods and clamps being omitted. Fig. 2 is a plan view of the mold filled with concrete, the top tie-rods being omitted. Fig. 3 is a vertical sectional view through a concrete wall in course of construction and the molds. Fig. 4 is an enlarged side view of a fragment of the mold, showing the meeting ends of the intermediate braces. Fig. 5 is a sectional view on the line 5 5 of Fig. 4. Fig. 6 is an enlarged perspective sectional view through a section of the mold, showing an intermediate brace. Fig. 7 is an end view of fragments of two superposed sections of the mold, showing portions of the end braces. Fig. 8 is a side view of fragments of superposed and abutting sections of the mold, showing portions of the end braces. Fig. 9 is a horizontal view on the lines 9 9 of Fig. 8. Fig. 10 is a perspective view of the end of a section of the mold, showing an end brace; and Fig. 11 shows a modified form of clamping device.

The present mold for concrete-wall construction consists of a plurality of like sections which are mutually interchangeable. Each section comprises a plate or plank 1, having strips 2 3, wider than its thickness, secured to its upper and lower edges, respectively, and forming flanges. Thus comparatively wide

bearing-surfaces are provided at the edges of the plate or plank. The plank carries braces at its ends and at intervals between its ends. These braces are to prevent any warping of the plank and to provide interlocking means to secure the sections together in a built-up mold. The intermediate braces are all alike. The end braces are the reverse of each other. The upper and lower ends of all braces are complementary with respect to each other, and hence the lower end of any brace will fit into the upper end of any other brace.

Each intermediate brace 4 consists of a casting conforming in shape to the flanged plank which it fits and is reinforced by a strengthening-rib 5. At its lower end each brace terminates in a toe 6, which is substantially wedge shaped. The toe 6 and the lower edge of the flanged plank are provided with a groove 7 to accommodate a tie-rod. At its upper end the brace terminates in a projection 8, having a seat 9 conforming in shape to the toe 6, so that the toe of a similar brace may fit snugly therein. The projection 8 is provided with a groove 10 to accommodate a tie-rod. The toe 6 and the projection 8 are provided with aligned vertical holes 11, through which a nail or pin may be passed to hold the braces in proper relative position while the tie-rods and clamps are being adjusted.

Each end brace 12 consists of a casting which is angular in cross-section and conforms in shape to the end of the flanged plank. The flange of the brace fitting over the end of the plank is flat and provided with screw-holes. A strengthening-rib 13 is provided on the outer flange of the brace. The brace terminates at its lower end in a substantially wedge-shaped toe 14, which is similar to the toe 6 on the intermediate brace, but is only half as wide as the latter. A notch 15 is provided at the corner of the toe and along the lower edge of the flat flange of the brace to accommodate a tie-rod. At its upper end each end brace has a projection 16, provided with a seat conforming in shape to the toe 14 of the brace and similar to the projection 8 of each of the intermediate braces, but only half as wide as the latter. At the end corner the projection 16 is provided with a notch 17 to accommodate a tie-rod. Near the top and bottom each end brace is provided with enlargements 18 19, through which holes 20 21, respectively, extend. Pins, nails, or the like may be inserted in said holes to secure abutting planks together while the rods are

being adjusted or at any other time. The toe 14 and projections 16 are provided with alined holes 22, which serve the same purpose as the holes 11 in the intermediate
5 braces.

In constructing a concrete wall as many of the sections above described as are required may be used. The sections are arranged in tiers separated from each other by a distance
10 equal to the desired thickness of the wall. The tiers consist of as many superposed horizontal rows of sections as may be desired. The superposed sections are arranged so that the toes of the upper braces fit into the seats
15 in the projections of the lower braces in vertical alinement therewith. The intermediate braces may interlock with intermediate braces or with end braces. In Fig. 1 the sections of the two superposed rows are shown
20 as meeting in the same vertical plane. The sections of the upper row could be arranged to meet in the plane of an intermediate brace, if desired. This is possible because the upper and lower ends of the intermediate
25 braces are twice as wide as the end braces. Thus two end braces can be interlocked with a single intermediate brace. When the sections are arranged as described, tie-rods 23 are passed through the holes formed by the
30 grooves in the meeting faces of the braces and extend through the opposite tiers of sections. The tie-rods are preferably provided with a crook 24 or the like on one end, which may be engaged by a tool. Clamps 25 are
35 arranged on the outer ends of tie-rods, two clamps to each end. Each clamp is substantially L-shaped, having one arm extending substantially parallel with the rod and having in the other arm a hole, through which
40 the tie-rod extends. The clamp is securely fixed in position on the tie-rod by means of a set-screw 26. In the construction illustrated in Figs. 3, 4, and 5 this set-screw 26 works in a threaded hole in the clamp itself, in which
45 case it locks the clamp directly to the rod and prevents any relative movement. In the construction illustrated in Fig. 11 the set-screw 26 works in a nut or collar 27, specially provided on the tie-rod for the purpose, and
50 this construction has the advantage that it allows the tie-rod to be rotated to break its bond with the concrete during the period of hardening without affecting the position or adjustment of the clamp. One clamp of
55 each pair of clamps is adjusted so that the end of its arm bears upon the upper section in the adjacent tier, while the other clamp is adjusted so that the end of its arm bears upon the lower section in the adjacent tier.
60 In order to permit the adjustment of the two clamps independently of each other, the arm of one of them is made longer than the arm of the other, as illustrated in Figs. 5 and 11. The set-screws being tightened, the tiers of

sections will be securely held so that they 65 cannot spread apart. The mold being thus assembled, the concrete is put inside and permitted to set sufficiently to retain its shape rigidly and sustain the weight of another layer of concrete. Then one or more of the
70 lower horizontal rows of sections are removed by loosening the corresponding clamps. The tie-rods are of course embedded in the concrete. They can, however, be loosened by applying a tool to the crook and
75 turning them to loosen them. Then they can be withdrawn and used again. The resulting holes 27 in the walls are pointed up by hand. The sections removed from below are then superposed on the top row of the re-
80 maining rows of the tier, being assembled in the same manner as before. The concrete is then put in the mold so built up and another horizontal portion of the wall formed. These steps being repeated, the wall may be con-
85 structed to any height desired, the same sections being used over and over again, the mold being built up as the work progresses and being supported by the completed portion of the wall. The sections of the mold
90 may be used indefinitely, as they are not injured in assembling and disassembling the mold.

Obviously my mold is capable of considerable modification within the scope of my in- 95 vention, and therefore I do not wish to be limited to the specific construction shown and described. The braces and their interlocking means may be given a great variety of forms. For example, one end of a brace 100 may be a simple loop or plain projection with an eye and the other end or toe may be a simple inclined pin adapted to enter the loop or eye of another brace by movement at a slight angle to the vertical. So construct- 105 ed the interlocking parts cannot be disengaged by accidental tilting of a section.

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

1. A mold for concrete-wall construction 110 comprising a plurality of interchangeable horizontal sections, each of said sections comprising a plate provided with flanges at its upper and lower edges, and a plurality of vertical braces secured to said plate at regular 115 intervals and each having a projection at one end and a corresponding seat at the other end, whereby the sections may be interlocked with each other.

2. A mold for concrete-wall construction 120 comprising a plurality of interchangeable sections, each of said sections comprising a plate provided with flanges at its upper and lower edges, end braces and intermediate braces secured to said plate, the ends of said 125 intermediate braces being twice as wide as the ends of said end braces, each of said braces having a projection at one end and a

corresponding seat at the other end, whereby the sections may be interlocked with each other.

3. A mold for concrete-wall construction comprising tiers of interchangeable sections, each of said sections comprising a plate flanged at its upper and lower edges and a plurality of braces secured to said plate at regular intervals and each having a projection at one end and a corresponding seat at the other end, whereby the sections in each tier may be interlocked with each other, tie-rods extending from one tier to the other, and clamps adjustably mounted upon the outer ends of said tie-rods and arranged to bear upon adjacent sections of the mold.

4. A mold for concrete-wall construction comprising tiers of interchangeable sections, each of said sections comprising a plate flanged at its upper and lower edges and a plurality of braces secured to said plate at regular intervals and each having a projection at one end and a corresponding seat at the other end, whereby the sections in each tier may be interlocked with each other, tie-rods extending from one tier to the other, and clamps adjustably mounted upon the outer ends of said tie-rods and arranged to bear upon adjacent sections of the mold, each of said clamps comprising an L-shaped member and a set-screw.

5. A mold for concrete-wall construction comprising tiers of interchangeable sections, each of said sections comprising a plate flanged at its upper and lower edges and a plurality of braces secured to said plate at regular intervals and each having a projection at one end and a corresponding seat at the other end, whereby the sections in each tier may be interlocked with each other, tie-rods extending from one tier to the other, and clamps adjustably mounted upon the outer ends of said tie-rods and arranged to bear upon adjacent sections of the mold, each of said clamps comprising an L-shaped member, a collar and a set-screw on said collar.

6. A mold for concrete-wall construction

comprising tiers of interchangeable sections, each of said tiers comprising plates, and braces secured to said plates and interlocking with each other, tie-rods extending from one of said tiers to the other, and a pair of clamps secured to each outer end of each of said tie-rods and having arms extending substantially parallel to said tie-rods, one of the clamps of each pair of clamps having a longer arm than the other, and each of said clamps bearing upon one of the adjacent sections of said mold.

7. A mold for concrete-wall construction comprising tiers of interchangeable sections, each of said tiers comprising a plurality of flanged plates, and braces secured to said plates and interlocking with each other, the meeting portions of said braces being provided with corresponding grooves, tie-bars extending through the holes formed by said grooves and from one of said tiers to the other and clamps secured to the outer ends of said tie-rods and bearing upon adjacent sections of said tiers.

8. A brace for a concrete-mold comprising a body terminating at one end in a toe and provided at the other end with a seat adapted to receive the toe of a similar brace in alinement therewith.

9. A brace for a concrete-mold comprising a body terminating at one end in a substantially wedge-shaped toe and provided at the other end with a seat adapted to receive the toe of a similar brace.

10. A mold for a concrete-wall construction comprising a plurality of flanged plates and braces secured to said plates and so interlocking with each other as to resist the tilting of said plates.

In testimony whereof I have hereunto signed my name, in the presence of two subscribing witnesses, this 18th day of December, 1905.

BERNHARD A. MUELLER.

In presence of—
WM. P. CARR,
J. B. MEGOWN.