No. 754,626. PATENTED MAR. 15, 1904.

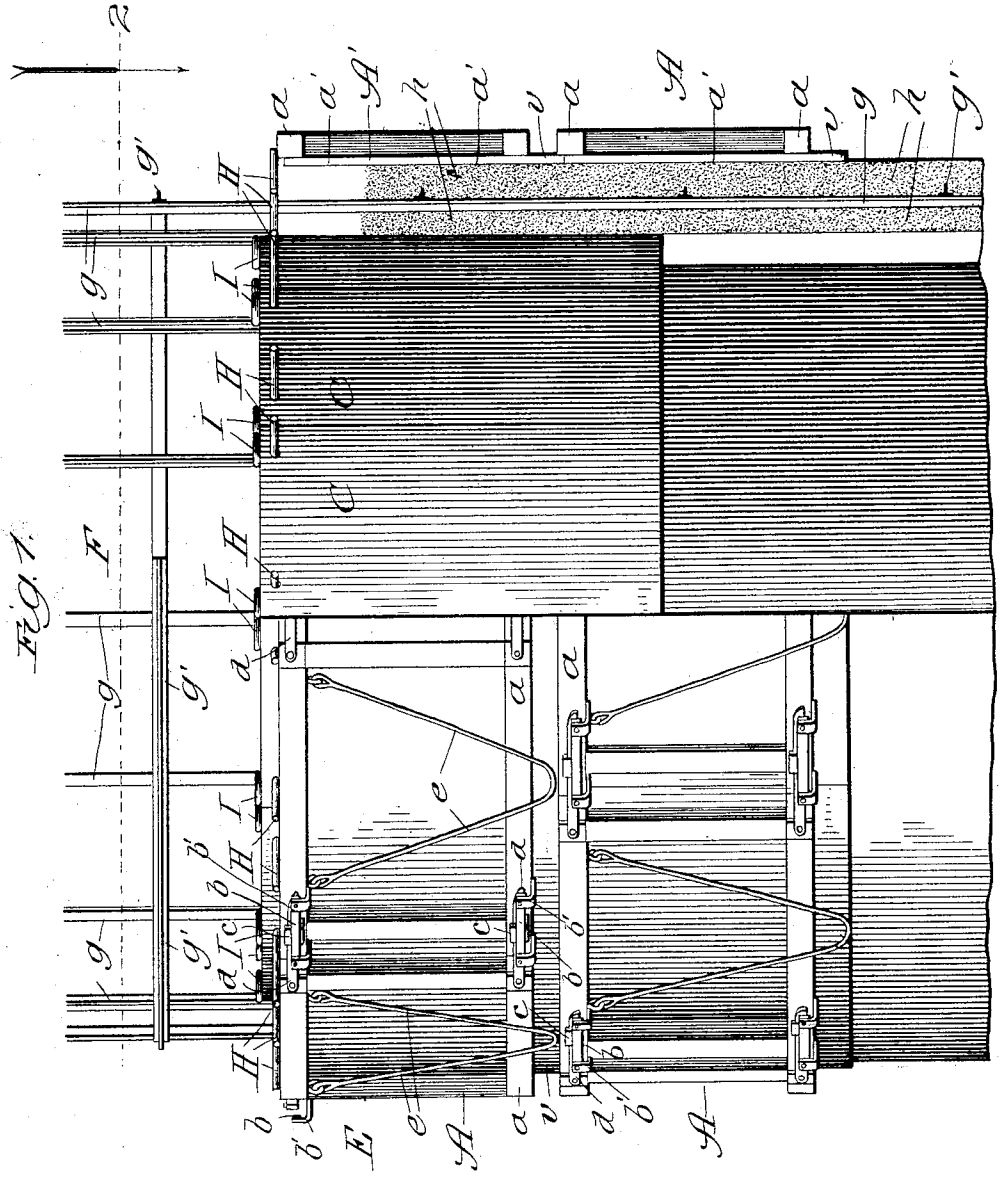
C. WEBER.

MOLD FOR METAL-CONCRETE CONSTRUCTION.

APPLICATION FILED JULY 21, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Carl E. Gaylord.
Geo. C. Darrow.

Inventor:
Carl Weber,
By Dyrenforth, Dyrenforth & Lee,
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 4 SHEETS—SHEET 2.

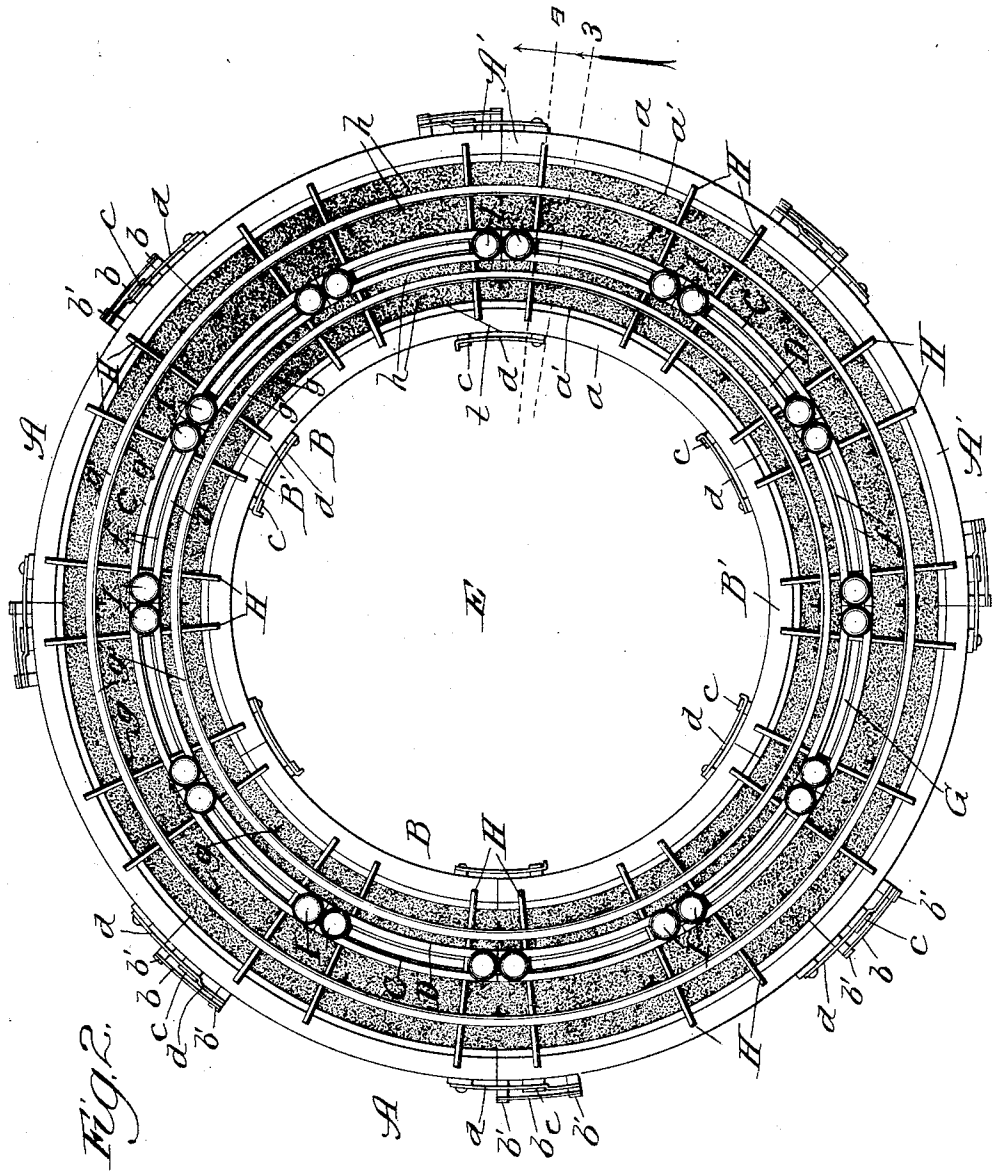


FIG. 2.

Witnesses:
C. C. Langford.
Geo. C. Lorimer.

Inventor:
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NO MODEL. 4 SHEETS—SHEET 3.

Fig. 3.

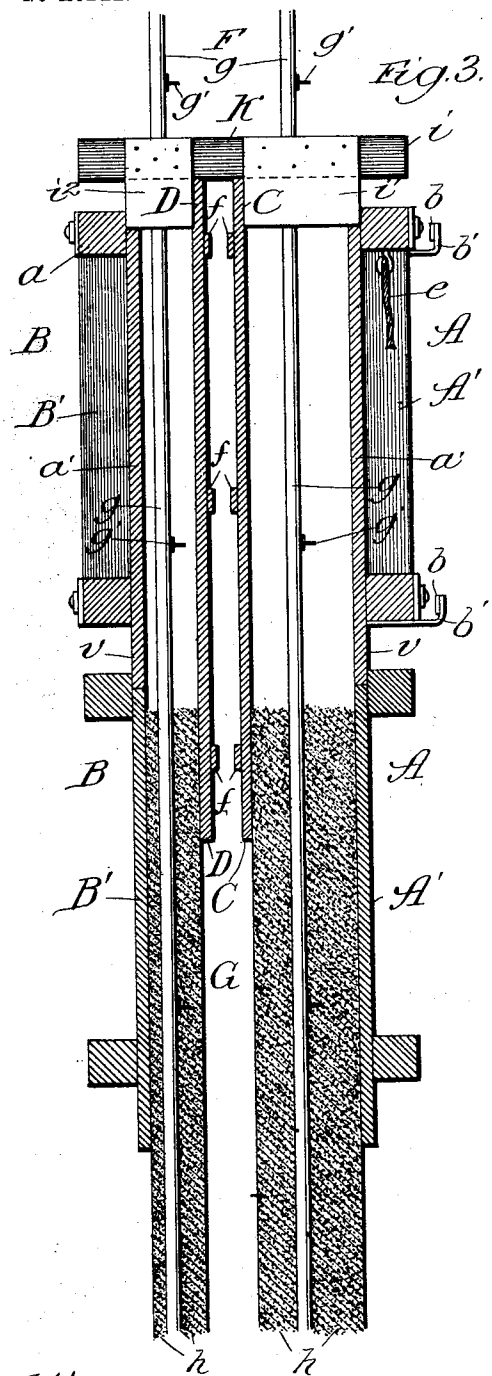
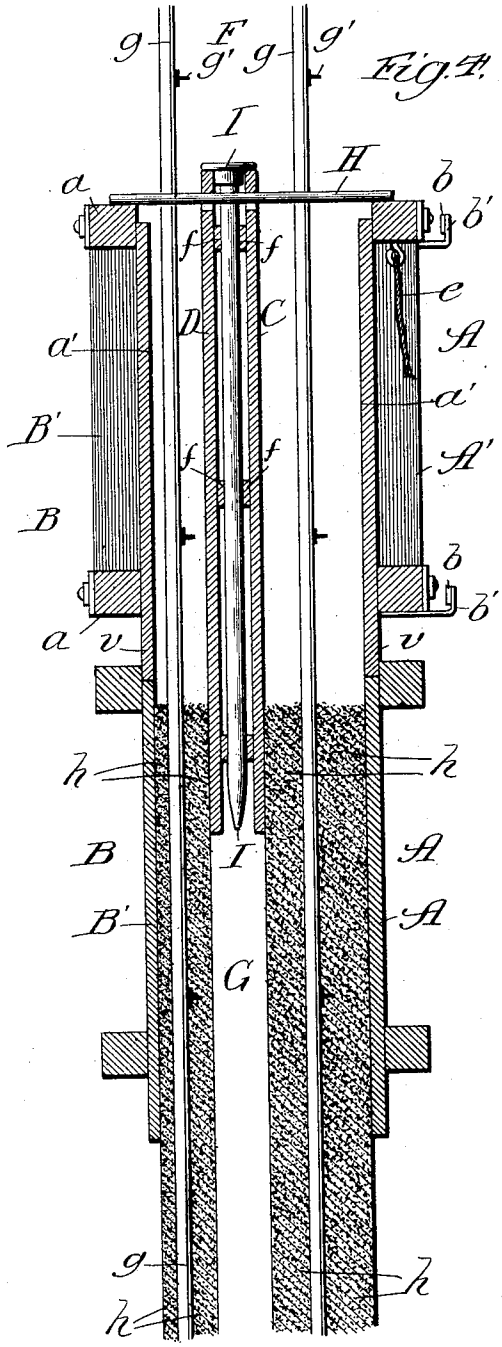


Fig. 4.



Witnesses:
Chas. S. Gaylord.
Geo. C. Pearson.

Inventor:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 754,626. PATENTED MAR. 15, 1904.

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MOLD FOR METAL-CONCRETE CONSTRUCTION.

APPLICATION FILED JULY 21, 1903.

NO MODEL. 4 SHEETS—SHEET 4.

Fig. 5.

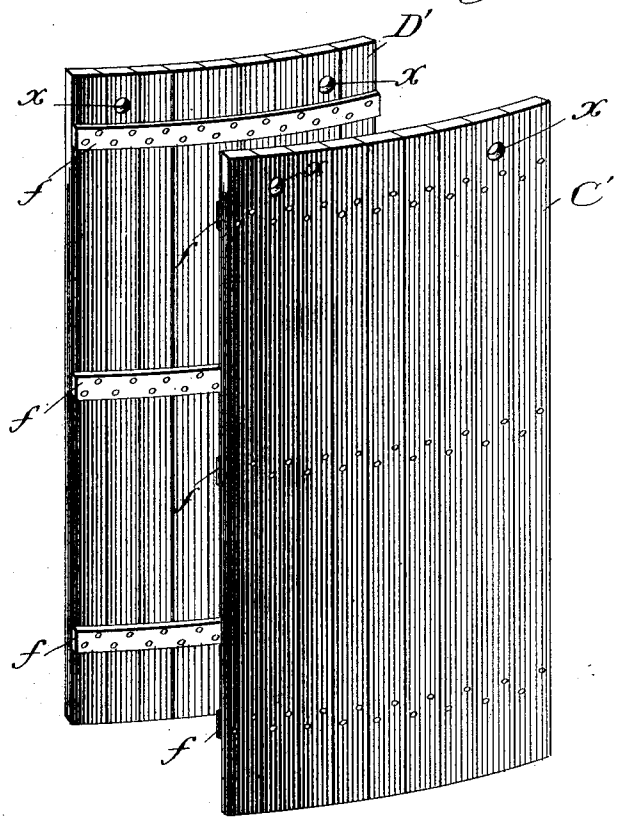
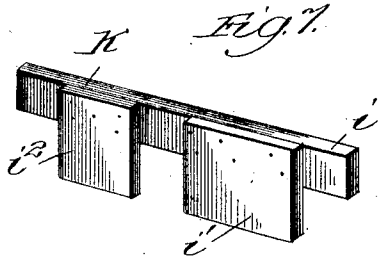


Fig. 6.



Fig. 7.



Witnesses:
Geo. C. Maylod.
Geo. C. Harrow.

Inventor:
Carl Weber.
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Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 754,626. Patented March 15, 1904.

UNITED STATES PATENT OFFICE.

CARL WEBER, OF CHICAGO, ILLINOIS, ASSIGNOR TO STEEL-CONCRETE CONSTRUCTION CO., OF CHICAGO, ILLINOIS, A CORPORATION OF MAINE.

MOLD FOR METAL-CONCRETE CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 754,626, dated March 15, 1904.

Application filed July 21, 1903. Serial No. 166,425. (No model.)

To all whom it may concern:

Be it known that I, CARL WEBER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Molds for Metal-Concrete Construction, of which the following is a specification.

My invention relates to an improved construction of molds for use in the erection of structures—such as chimneys, stand-pipes, water-towers, and the like—which are composed of structural metal beams or bars embedded in concrete, and more particularly of any such structure which is provided with a circumferential air-space between two walls, as in the case of the chimney forming the subject of my application, Serial No. 156,148, filed May 8, 1903.

The construction of the outer and inner molds forming the subject of this application is like that of the molds set forth in my application, Serial No. 163,461, filed June 29, 1903, for use in the practice of the method of erecting metal-concrete structures forming the subject of my application, Serial No. 163,462, filed June 29, 1903; and the invention in the present application relates especially to the intermediate molds and their coöperation with the inner and outer molds for forming the air-space.

Referring to the accompanying drawings, Figure 1 shows by a broken view in elevation, party sectional, my improved molds in use on a chimney of the variety hereinbefore referred to undergoing erection. Fig. 2 is a section taken at the line 2 on Fig. 1 and viewed in the direction of the arrow; Fig. 3, a section taken at the line 3 on Fig. 2 viewed in the direction of the arrow and enlarged; Fig. 4, a section taken at the line 4 on Fig. 2 viewed in the direction of the arrow and enlarged; Fig. 5, a perspective view showing the sections of which the intermediate molds used to form the air-space are composed; Fig. 6, a similar view of one of the bars used for spacing and spreading apart the intermediate molds, and Fig. 7 a similar view of a centering device for use on the intermediate molds at their upper ends.

As and for the purpose set forth in my aforesaid applications Serial Nos. 163,461 and 163,462, the molds in the present case are also adapted to be readily removed after a section of the structure undergoing erection has been molded and to be as readily raised and adjusted upon that section into position for molding the next succeeding section, this procedure being repeated throughout the erection.

A is the outer mold, and B is the inner mold, each formed of a plurality of segmental sections (denoted at A′ and B′, respectively, on the drawings) releasably locked together, though the outer mold, being of the greater diameter, contains the greater number or greater length of sections. Each of these mold-sections is preferably, but not necessarily, formed of wood and comprises a substantial frame *a* of required shape, having fastened to one side matched boards forming an unbroken face *a′*, which projects below the lower frame member, as represented at *v*. On the outer side of the frame, near each corner at one end of the mold-section, is fastened a catch *c*, crossed by a guard, serving the purpose hereinafter described and comprising a bar *b*, fastened at its ends to bearings *b′*, projecting from the upper and lower frame members. On the same side of the frame near each corner at the opposite end of the mold-section is pivoted a latch *d*. From the upper frame member of each section A′ there depends a hanger *e*, preferably in the form of a rope, for the purpose hereinafter described.

C and D denote the intermediate molds to coöperate, respectively, with the molds A and B and formed, like them, of segmental sections C′ and D′, preferably of the construction represented in Fig. 5, in which each of the sections is shown to comprise a series of matched boards fitted edgewise together to present smooth surfaces and fastened together by cross-bars *f*, of which three are shown on each section nailed or screwed to one side thereof. Near the upper end of each section C′ and D′, at opposite sides of its longitudinal center, it is provided with apertures *x x*, for a purpose hereinafter described.

To employ the molds thus described in the

erection of a round chimney E, containing an air-space G, after the foundation (not shown) is laid, the frame structure F, Fig. 1, comprising upright T-bars *g*, rising from the foundation in the two circular series, one concentrically within the other and each encircled at intervals by similar bars *g'* in annular form, is erected for a portion of the structure. About the base of the framework for the outer wall the outer mold A is adjusted by placing sections A' edgewise together and locking them from one to the other by engaging the latches *d* on each with the catches *c* on the one next adjacent thereto, and the inner mold B is adjusted inside the inner framework by placing sections B' edgewise together and locking them from one to the other by engaging the latches *d* on each with the catches *c* on the one next adjacent thereto. The meeting edges of two of the sections of the inner mold B are oblique, as shown at *t* in Fig. 2, to facilitate adjustment of the sections and dismemberment of the mold, as hereinafter described. Within the circle described by the outer mold A at a distance from it according to the thickness desired of the outer wall the mold C is adjusted by abutting its sections C' together in required number with the ribbed surfaces innermost; and in a similar manner the mold D is adjusted in place concentrically with and between the molds C and B at a distance from the former according to the width of air-space G desired and at a distance from the latter according to the thickness desired of the inner wall of the structure.

For a purpose hereinafter explained the sections of the intermediate molds, all of the same dimensions, extend somewhat higher or are longer than those of the molds of A and B.

With the four molds forming the first set thereof adjusted on the foundation, as described, the space between the molds A and C and that between the molds D and B are filled with concrete *h* about the portion of the framework within the respective spaces, whereby the beams are embedded in the concrete. When the concrete has set, another similar set of four molds is adjusted in the manner described of the lowermost set upon the latter, whereby the upper edges of the molds A and B of the first set receive and overlap the lower edges of the molds imposed upon them, and the molds C and D of the second set project in the space G below the junctions of the two sets of outer and inner molds and somewhat beyond their upper ends. To support the molds C and D of the second set, rods H H are passed through coinciding openings *x x* in their sections C' D' to rest at their ends on the molds A and B. When the second pair of intermediate molds has been adjusted in place, they are centered at their lower ends by protrusion of the latter into the air-space G, and to spread and space them uniformly apart headed spacer-bars I, pointed at their extremities and which may be hollow for lightness, are inserted between them adjacent to the rods H, as represented in Fig. 2, to hang by their heads on the upper edges of the intermediate molds, the diameter of each spacer-bar corresponding with the width of space between the cross-bars *f* of the sections C' D' when they are properly centered. To prevent any deflection in the wall-surfaces forming the air-space G, the upper protruding ends of the molds C and D require to be centered, and for this purpose the centering device K, Figs. 3 and 7, is provided, comprising a board *i*, having fastened to one side blocks *i'* and *i²* to depend from it at a suitable distance apart to cause the block *i'*, of proper width for the purpose, to extend across the space between the molds C and A and the block *i²*, of proper width for the purpose, to extend across the space between the molds D and B, as represented in Fig. 3, while the blocks embrace between them the molds C D, these spacing devices being employed at suitable intervals apart about the last-adjusted set of molds. The spaces between the second set of molds A B and C D are then filled with concrete *h*. When this concrete becomes set, the hanger *e* on each section A' of the lowermost outer mold is raised and caught on a suitably-placed hook or holder, (not shown,) whereupon the latches of all those sections are disengaged from their respective catches and the sections separate or become readily separable, but cannot fall apart because of being held by suspension on the hangers *e*. The latches locking together the section of the inner mold B are disengaged from their catches to enable the sections B' to be separated, and the laborers, who work on a suitable scaffolding (not shown) built inside the chimney E as the erection thereof progresses, raise the mold-sections on top of the molds last placed and adjust them on the latter in the manner already described of adjusting the second set of molds on the lowermost set thereof. The spaces between the newly-adjusted molds are then filled with concrete, and when it becomes set the molds of the then lowermost set of four are dismembered and the sections are raised upon the last-finished section of the structure and adjusted in the manner already described. Thus the work proceeds of dismembering the lowermost set of molds and adjusting them for use on the last-finished portion of the structure and repeating this operation, for which only two sets of the molds are required, until the erection is completed, which may involve splicing further lengths of the beams *g* to the upper ends of those embedded and encircling these upright extensions at intervals with annular beams *g'*.

In Fig. 1 only one (the inner) circular series of beams for the frame structure is represented above the completed portion of the chimney, the outer framework being omitted

to avoid the confusion in the figure which its representation would tend to produce.

The guards *b* shield the latches *d*, provided with them, against being engaged by the mold-sections A′ being raised past them and dislodged thereby from the catches.

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

1. A set of molds for the purpose set forth, comprising an outer mold and an inner mold each composed of a series of sections provided with means for releasably locking them one to another, and two intermediate molds to cooperate, respectively, with said outer and inner molds, each comprising a series of edgewise-abutting sections, substantially as described.

2. A set of molds for the purpose set forth, comprising an outer mold and an inner mold each composed of a series of sections provided with means for releasably locking them one to another, and two intermediate molds to cooperate, respectively, with said outer and inner molds, each comprising a series of edgewise-abutting sections provided with openings to receive supporting-rods, substantially as described.

3. A set of molds for the purpose set forth, comprising an outer mold and an inner mold each composed of a series of sections provided with means for releasably locking them one to another, hangers on the sections of the outer mold, and two intermediate molds to coöperate, respectively, with said outer and inner molds, each comprising a series of edgewise-abutting sections, substantially as described.

4. A set of molds for the purpose set forth, comprising an outer mold and an inner mold each composed of a series of sections provided with means for locking them one to another and each formed of a frame provided with a facing projecting beyond its lower end, and two intermediate molds to coöperate, respectively, with said outer and inner molds, each comprising a series of edgewise-abutting sections of greater length than the sections of said outer and inner molds, substantially as described.

5. A set of molds for the purpose set forth, comprising an outer mold and an inner mold each composed of a series of sections provided with means for releasably locking them one to another and each formed of a frame provided with a facing projecting beyond its lower end, and two intermediate molds to coöperate, respectively, with said outer and inner molds, each comprising a series of edgewise-abutting sections of greater length than the sections of said outer and inner molds and provided with openings to receive supporting-rods, substantially as described.

6. A set of molds for the purpose set forth, comprising an outer mold and an inner mold each composed of a series of sections provided with means for releasably locking them one to another and each formed of a frame provided with a facing projecting beyond its lower end, and two intermediate molds to cooperate, respectively, with said outer and inner molds, each comprising a series of edgewise-abutting sections of greater length than the sections of said outer and inner molds and having cross-bars for coöperation with spreader-rods inserted between the intermediate molds, substantially as described.

7. A set of molds for the purpose set forth, comprising an outer mold and an inner mold each composed of a series of sections provided with means for releasably locking them one to another and each formed of a frame provided with a facing projecting beyond its lower end, and two intermediate molds to cooperate, respectively, with said outer and inner molds, each comprising a series of edgewise-abutting sections of greater length than the sections of said outer and inner molds to project beyond the latter at their opposite ends and cöoperate at their upper ends with a centering piece, said intermediate mold-sections having openings to receive supporting-rods and cross-bars for coöperation with spreader-rods inserted between said last-named molds, substantially as described.

CARL WEBER.

In presence of—
W. B. DAVIES,
WALTER N. WINBERG.