No. 775,685. PATENTED NOV. 22, 1904.

H. L. SHUTE & H. C. HENSCHEN.

APPARATUS FOR MOLDING CONCRETE WALLS.

APPLICATION FILED JUNE 11, 1904.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

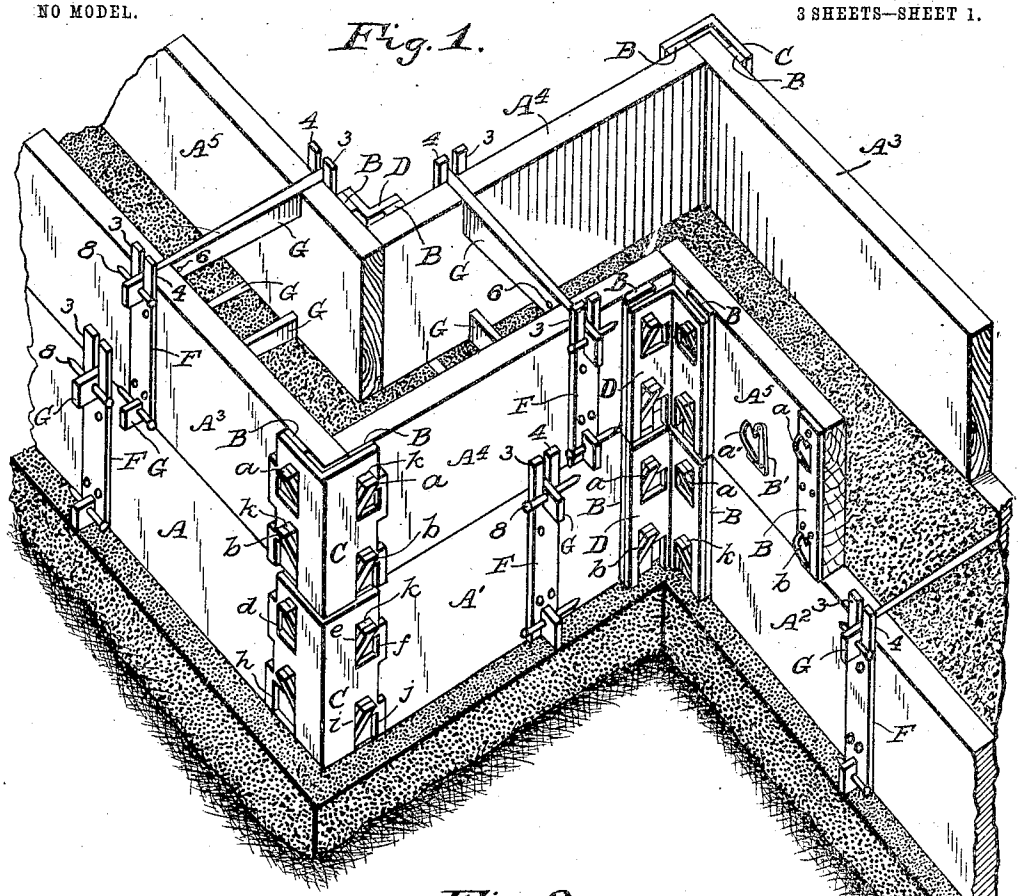


Fig. 2.

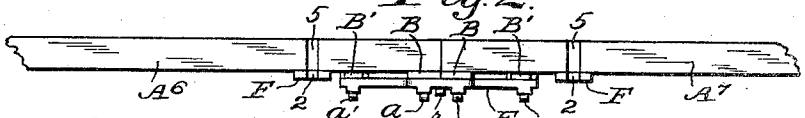
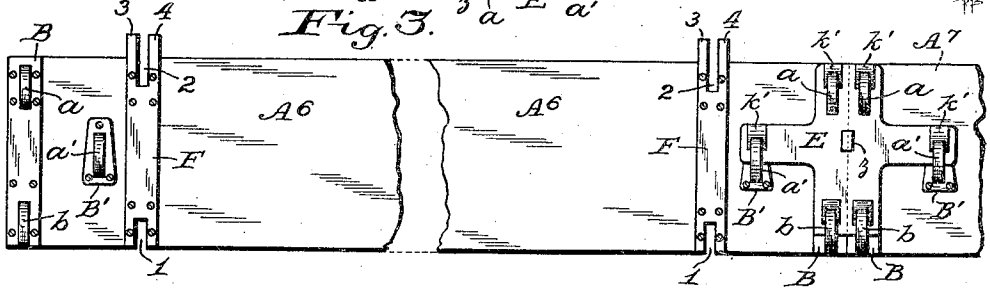


Fig. 3.



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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 4.

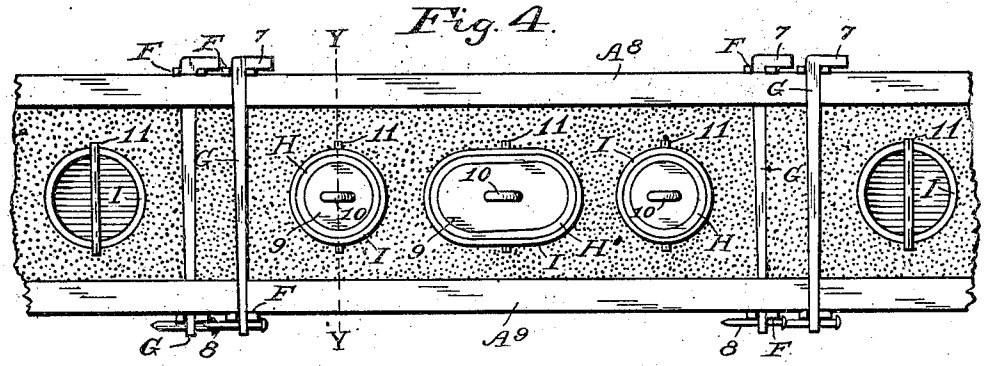


Fig. 5.

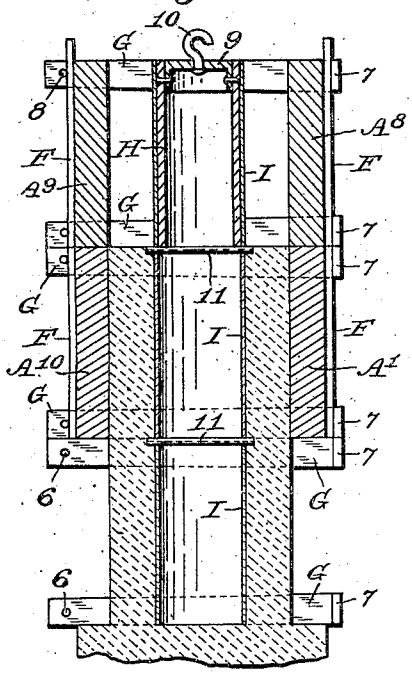


Fig. 6.

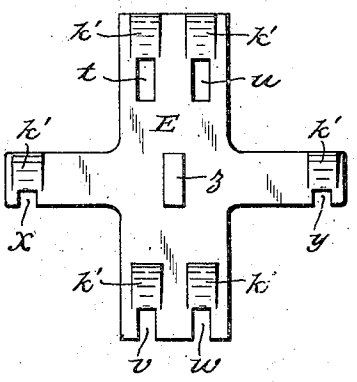


Fig. 7.

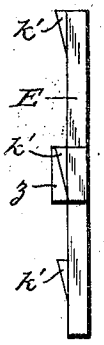


Fig. 8.

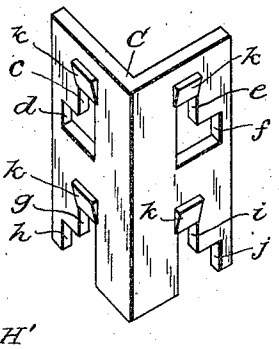


Fig. 9.

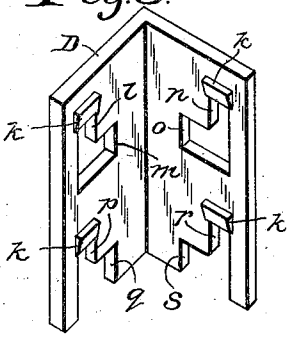
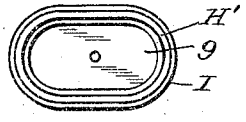


Fig. 10.



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APPARATUS FOR MOLDING CONCRETE WALLS.

APPLICATION FILED JUNE 11, 1904.

NO MODEL. 3 SHEETS—SHEET 3.

Fig. 11.

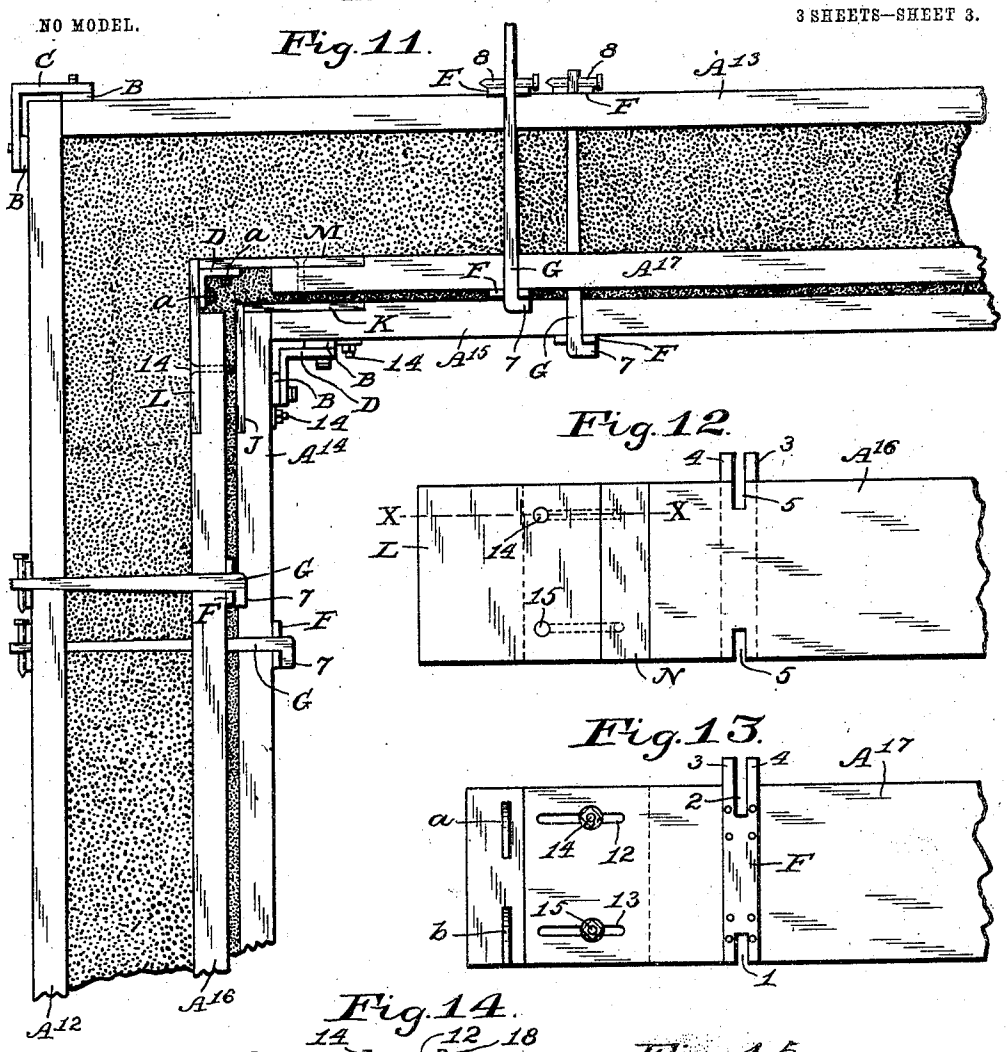


Fig. 12.

Fig. 13.

Fig. 14.

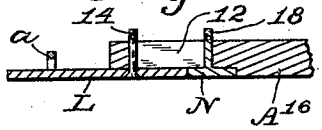


Fig. 15.

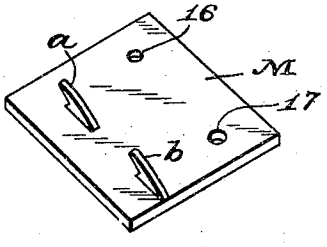
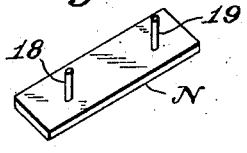


Fig. 16.



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No. 775,685. Patented November 22, 1904.

UNITED STATES PATENT OFFICE.

HAMLIN L. SHUTE AND HARRY C. HENSCHEN, OF INDIANAPOLIS, INDIANA.

APPARATUS FOR MOLDING CONCRETE WALLS.

SPECIFICATION forming part of Letters Patent No. 775,685, dated November 22, 1904.

Application filed June 11, 1904. Serial No. 212,072. (No model.)

To all whom it may concern:

Be it known that we, HAMLIN L. SHUTE and HARRY C. HENSCHEN, citizens of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented new and useful Improvements in Apparatus for Molding Concrete Walls; and we do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to the construction of continuous molded walls, piers, columns, and like structures formed of concrete composition; and the invention has particular reference to the molding-forms and the couplings therefor and to the supports and the gages for the forms, the object of the invention being to provide improved apparatus and appliances that may be used expeditiously and economically in the construction of structures of the character indicated.

With the above-mentioned and other objects in view the invention consists in improved mold-forms, couplers for the forms, supports and gages for the forms, and couplings for connecting the sections of the forms together; and the invention consists also in improved cores and appliances for forming hollow walls.

The invention consists, further, in the parts and the combinations and arrangements of parts, as hereinafter particularly described and claimed.

Referring to the drawings, Figure 1 is a fragmentary perspective view of parts of the apparatus and appliances in operative positions in connection with a concrete wall under construction; Fig. 2, a fragmentary top plan of two connected plane mold-forms; Fig. 3, a fragmentary front elevation of two connected plane forms; Fig. 4, a fragmentary top plan view of plane forms and a straight hollow wall and the cores for forming the same; Fig. 5, a transverse vertical sectional view, as at the line Y Y in Fig. 4, showing the hollow wall and the apparatus and appliances for forming the same; Fig. 6, a front elevation of one of the end couplings for the mold-forms; Fig. 7, a side elevation of the end coupling; Fig. 8, a perspective view of one of the outer corner-couplers for the mold-forms; Fig. 9, a perspective view of one of the inner corner-couplers for the mold-forms; Fig. 10, an inverted plan view of one of the cores and a sleeve as a lining for the aperture in the wall applied to the core; Fig. 11, a fragmentary plan view of the mold-forms in connection with a corner-wall, showing improved mold-forms adapted to be extended when the wall is to be narrowed above the different stories; Fig. 12, a fragmentary elevation of the inner side of an extensible mold-form; Fig. 13, a fragmentary elevation of the outer side of the improved form; Fig. 14, a fragmentary horizontal longitudinal sectional view on the plane of the line X X in Fig. 12; Fig. 15, a perspective view of one of the metallic extension ends of the mold-forms, and Fig. 16 is a perspective view of a filling-plate used in connection with the extensible forms.

Similar reference characters in the several figures of the drawings designate corresponding elements or features.

In construction the mold-forms are composed of wooden planks provided with metallic devices whereby they may be connected together by means of couplers and also provided with matching devices and other appliances to be hereinafter described. The forms A, A′, A^3, A^4, A^{12}, and A^{13} are designed to be used to form the outer sides of corner-walls, the forms A, A′, A^3, A^4, and A^{12} being adapted to also be used to form the inner sides of corner-walls, and the forms A^2, A^5, A^{14}, A^{15}, A^{16}, and A^{17} are for use in forming the inner sides of corner-walls. The forms A^6, A^7, A^8, A^9, A^{10}, and A^{11} are designed for forming straight or plane faces of walls.

The couplers for connecting the ends of the forms together each include a pair of identical lug-plates B, that are secured to the outer faces of the forms, each plate having a pair of lugs *a* and *b* projecting outwardly and upwardly when the form is in operative position. Each lug has an inner wedge-face disposed toward its supporting-plate. In some cases the plates B are placed close to the ends of the forms, as at one end of A^4, A^6, and A^7, and in other cases the plates are at a distance

from the form end equal to the thickness of the form, as at the opposite end of A^4 and on A^3 and A^5. The couplers also include detachable locking-plates for coöperating with the lugs, there being both straight plates and angular plates.

The locking-plates C, comprising detachable parts of the outer corner-couplers, are formed as sections of L-shaped angle-bars, there being thus two wings designed to cooperate with both angles of a corner. The plate has four slots *c e g i*, the slots having side recesses *d f h j*, respectively disposed at the farther sides thereof from the corner of the plate to permit of movements of the plate when it is being connected to and disconnected from the lugs. Above each slot is a wedge *k* at the outer side of the plate integral therewith to engage the wedge-faces of the lugs on the plates B. The slots are adapted to receive the lugs which project through the plates when in use, as will be seen.

The locking-plates D, comprising detachable parts of the inner corner-couplers, are in form similar to the plates C in that they are angular and have slots *l n p r* to receive the lugs of the plates B, the slots having side recesses *m o q s*, respectively disposed at the nearer sides thereof to the corners of the plates to permit lateral movements of the wings of the plate with respect to the lugs. Wedges *k* are attached to the plate above the slots to engage the wedge-faces of the lugs of the plates B.

The locking-plates E, comprising detachable parts of the couplers for the ends of the plane molds, are each formed as a flat plate notched at its corners and provided with slots *t u v w* to receive the lugs of a pair of adjacent plates B, the plate E also having slots *x* and *y* to receive lugs *a'*, attached to plates B', that are secured to the forms, as A^6 and A^7, near the plates B. The plate is provided with integral wedges *k'* above the slots to engage the lugs of the form-plates. The middle portion of the plate E has a projection *z*, which may be hammered in order to release the locking-plate from the lugs.

Gage-plates F are secured to the outer faces of the forms, as A $A'A^2A^6$ A^7, each plate extending from the bottom of the form beyond the top thereof and having in the lower end thereof a slot 1, and in the upper end thereof a slot 2 deeper than the slot 1, the projecting upper end of the plate forming gage-fingers 3 and 4, against which a form may bear to insure matching of the forms one upon another, the inner faces of the fingers being in the same plane as the outer faces of the forms. In the edges of the forms are notches 5 opposite the slots 1 and 2.

Gage-bars G are employed for preventing the forms from spreading, and in the present case the bars are designed for use in thick walls, being tapering both in width and height, so as to be easily driven from the walls after removal of the forms. Each bar has a number of pin-holes 6 near the smaller end thereof and is provided with a head 7 at the larger end thereof, pins 8 being inserted in holes 6, the holes being so arranged as to serve as gages for walls of different thicknesses. The slots 1 and 2 are sufficiently large to freely admit the bars G.

When hollow walls are desired, suitable cores are employed, which may be either circular or oblong in plan, each core comprising a shell H or H', to which a top 9 is secured, a hook 10 being attached to the top for lifting the core from the concrete. In order to prevent the concrete from adhering to the core and rendering its withdrawal difficut, sleeves I are employed to cover the core-shell and remain as linings in the openings made by the cores. The cores are very slightly tapering, (not shown,) as much would be objectionable, and ordinarily they would stick to the concrete. The sleeves are preferably composed of cheap strawboard or tar-paper and permit the cores to be readily withdrawn therefrom, while the sleeves adhere as linings in the openings and may later be removed therefrom or left to perish in the course of time. Small wire bars 11 are laid on the wall courses for supporting the cores and sleeves temporarily while filling in the concrete about the cores, the bars usually being allowed to remain, although they may be bent and removed, if desired.

The extensible mold-forms, as A^{14} and A^{15}, are provided with removable filling-plates J and K, respectively, the inner sides of the forms being suitably recessed to receive the plates as well as the extension-plates L and and M, which are substituted for the filling-plates, as on forms A^{16} and A^{17}, when the wall is to be narrowed at the top of a story. The forms have horizontally-disposed slots 12 and 13, in which are bolts 14 and 15 for securing the plates to the forms. Each plate L and M has bolt-holes 16 and 17 to receive the bolts, and it is provided with integral lugs *a* and *b* to be engaged by the plate D. When the plates L and M are moved out, so as to increase the lengths of the forms, the gaps in the faces of the forms are filled by filling-plates N, having each a pair of studs 18 and 19 inserted in the slots 12 and 13 and suitably secured therein.

In practical use, as will be seen in Fig. 1, the lower course of concrete has been filled in the mold-forms upon the foundation, and the next upper course of forms has been set on the lower forms ready to be filled with the concrete, after which the lower forms may be removed, the upper forms then being supported by the bars G. The plates C, D, and E may be released by driving them upwardly somewhat, after which they may be lifted from the lugs of the coupler-plates B B'. As

seen in Fig. 5, the lower course is completed and the lower bars G may be removed. The sleeve I remains, but may also be removed. The next upper course appears as complete, but is supposed to be setting, while a third course may be built up in the forms already set in position, the cores also being positioned. In Fig. 11 a thick wall is supposed to have been built and the forms A^{16} and A^{17} are set in and extended at their ends, so that the wall may be narrowed. After building up a story the plates L and M may be further extended to suit a narrower wall, the filling-plates N being then attached to the forms, as in Fig. 12. In other respects the forms and attachments are used in the ordinary manner.

Having thus described the invention, what we claim as new is—

1. Apparatus, for molding concrete walls, including forms provided with slotted gage-plates having fingers extending beyond the top edges of the forms, and gage-bars coöperating with the slotted gage-plates.

2. Apparatus, for molding concrete walls, including forms having recesses in the tops and bottoms thereof, and gage-plates each having slots opposite the recesses in the forms and extending beyond the top edges of the forms.

3. Apparatus, for molding concrete walls, including a pair of mold-forms provided each with a plate having a pair of lugs wedge shape at their inner sides, and a slotted coupler-plate coöperating with the plates and the lugs thereof in engagement with the wedge-shape inner sides of the lugs.

4. Apparatus, for molding concrete walls, including forms, couplers for the form ends comprising each a locking-plate notched at its corners and provided with slots to receive lugs, a pair of plates having each a pair of wedging-lugs attached thereto, and a pair of plates having each a single wedging-lug attached thereto, the plates being secured to the forms, and the locking-plate coöperating with the wedging-lugs and their supporting-plates.

5. Apparatus, for molding concrete walls, including forms provided with extensible ends having lugs, filling-plates to coöperate with the forms, and angular coupler-plates having slots to receive the lugs.

6. Apparatus, for molding concrete walls, including a pair of mold-forms, a pair of plates attached to the forms and having each a pair of lugs, and a coupler-plate having slots therein to receive the lugs and provided with wedges to engage the lugs.

7. Apparatus, for molding concrete walls, including a plurality of mold-forms provided each at an end thereof with a coupler-plate having a pair of lugs and also a coupler-plate having a single lug, and a locking-plate having slots therein to receive the lugs of two adjacent ends of the forms.

8. In apparatus for molding concrete walls, the combination of a locking-plate having two wings each having a plurality of slots therein having recesses at the sides thereof, and wedges adjacent to the slots, with mold-forms provided with coupler-plates having lugs for coöperating in the slots with the wedges.

9. In apparatus for molding concrete walls, the combination of recessed mold-forms provided with extension-plates mounted adjustably in the recesses of the forms and having lugs thereon, filling-plates for the recesses of the form, and a locking-plate for coöperation with the extension-plates and the lugs thereof.

10. In apparatus for molding concrete walls, the combination of mold-forms, extension-plates for coöperation with the forms provided with lugs, filling-plates for the form, and a locking-plate having slots therein and wedges adjacent to the slots for coöperating with the lugs.

In testimony whereof we affix our signatures in presence of two witnesses.

HAMLIN L. SHUTE.
HARRY C. HENSCHEN.

Witnesses:
WM. H. PAYNE,
E. T. SILVIUS.