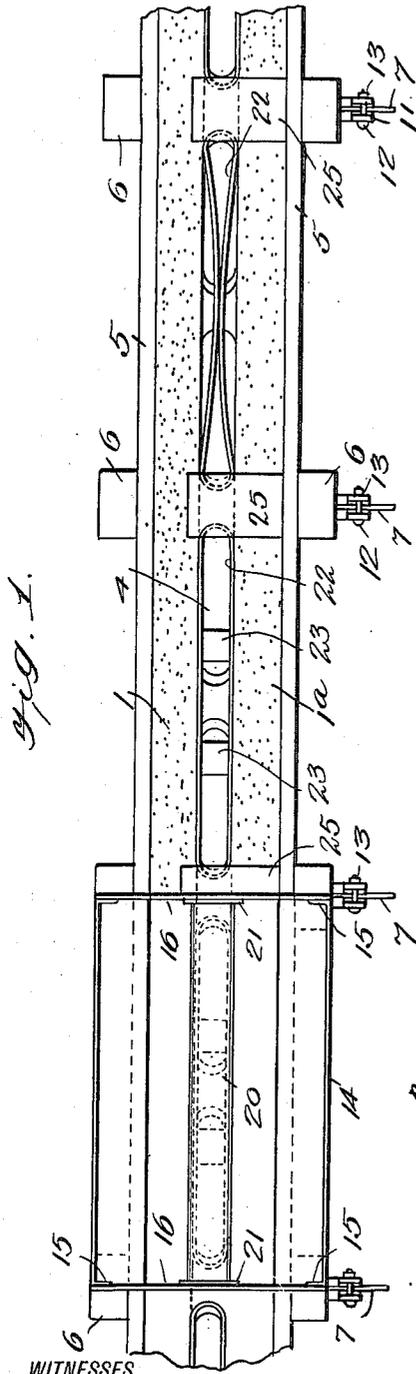


G. COUSINS.  
 WALL MOLDING STRUCTURE.  
 APPLICATION FILED JUNE 15, 1914.

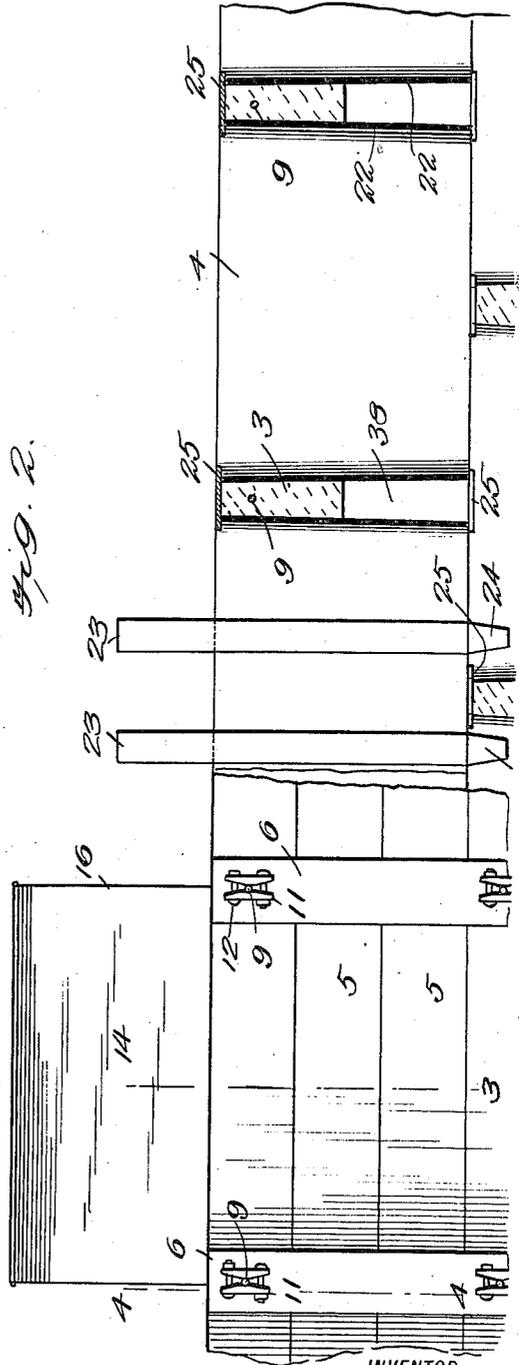
1,149,032.

Patented Aug. 3, 1915.

4 SHEETS—SHEET 1.



WITNESSES  
*H. B. Barry*  
*C. E. Trammor*



INVENTOR  
*George Cousins*  
 BY *Munn & Co.*  
 ATTORNEYS

G. COUSINS.  
 WALL MOLDING STRUCTURE.  
 APPLICATION FILED JUNE 15, 1914.

1,149,032.

Patented Aug. 3, 1915.

4 SHEETS—SHEET 2.

Fig. 3.

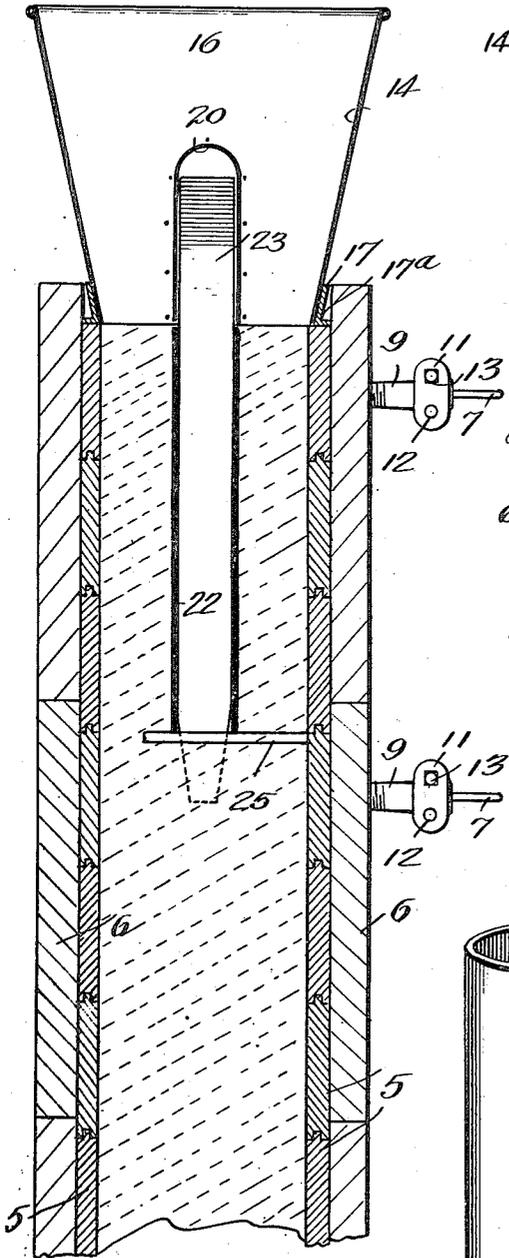
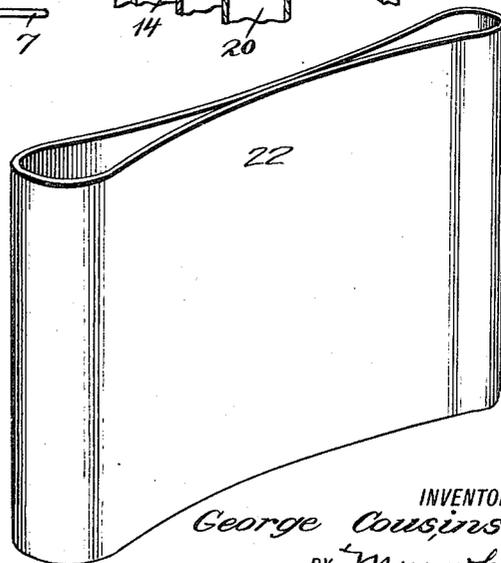
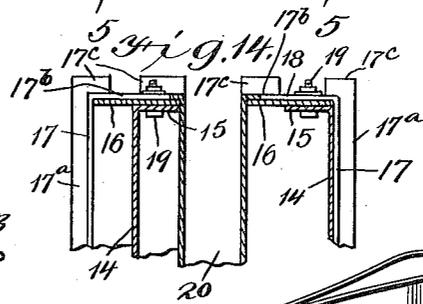
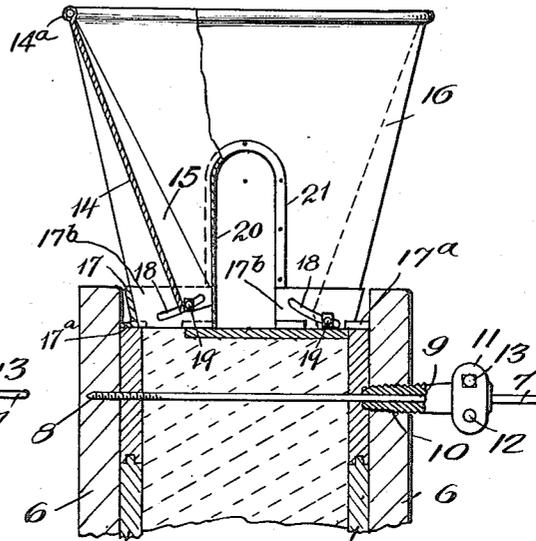


Fig. 4.



WITNESSES.

F. C. Barry  
 C. E. Franier

INVENTOR  
 George Cousins  
 BY *Munn & Co.*

Fig. 5.

ATTORNEYS

G. COUSINS.  
 WALL MOLDING STRUCTURE.  
 APPLICATION FILED JUNE 15, 1914.

1,149,032.

Patented Aug. 3, 1915.

4 SHEETS—SHEET 3.

Fig. 6.

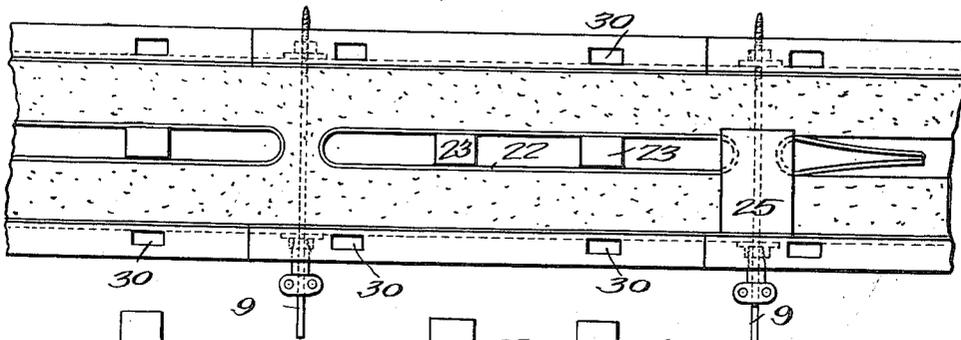


Fig. 7.

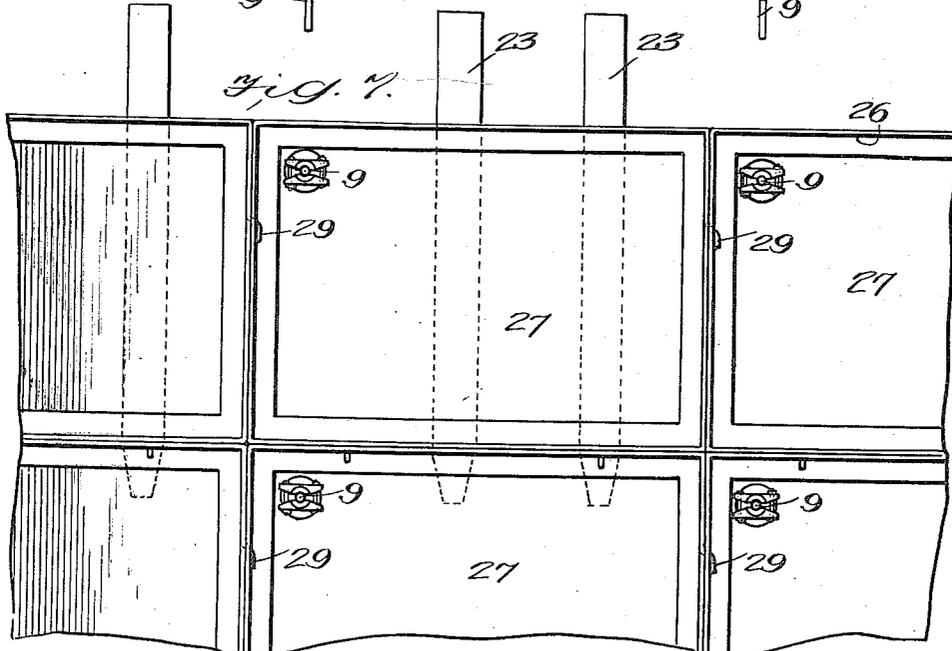


Fig. 8.

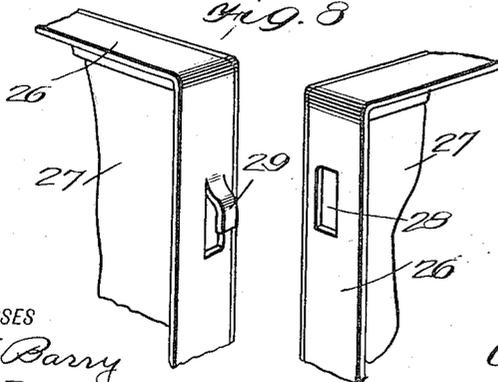
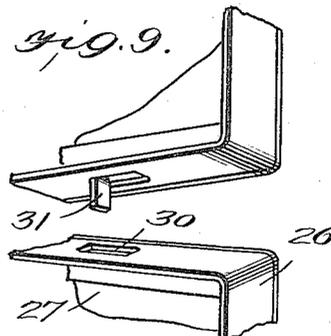


Fig. 9.



WITNESSES  
*F. C. Barry*  
*C. G. Francis*

INVENTOR  
*George Cousins*  
 BY *Munn & Co.*

ATTORNEYS

G. COUSINS.  
WALL MOLDING STRUCTURE.  
APPLICATION FILED JUNE 15, 1914.

1,149,032.

Patented Aug. 3, 1915.

4 SHEETS—SHEET 4.

Fig. 10.

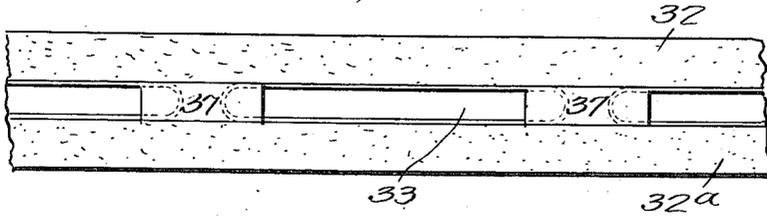


Fig. 11.

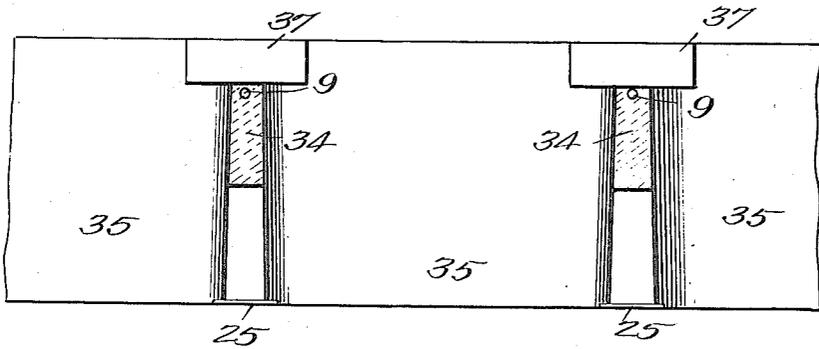


Fig. 12.

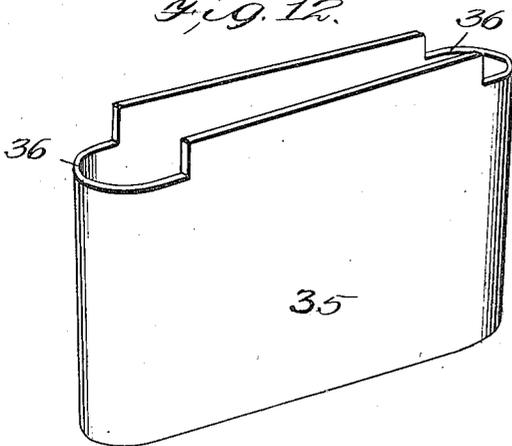
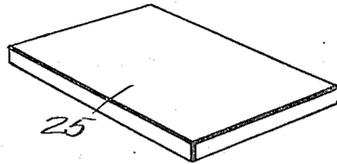


Fig. 13.



WITNESSES  
G. E. Barry  
C. E. Frazer

INVENTOR  
George Cousins  
BY *Munn & Co.*  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

GEORGE COUSINS, OF OSWEGO, NEW YORK.

## WALL-MOLDING STRUCTURE.

1,149,032.

Specification of Letters Patent.

Patented Aug. 3, 1915.

Application filed June 15, 1914. Serial No. 845,244.

*To all whom it may concern:*

Be it known that I, GEORGE COUSINS, a citizen of the United States, and a resident of Oswego, in the county of Oswego and State of New York, have made certain new and useful Improvements in Wall-Molding Structure, of which the following is a specification.

My invention is an improvement in wall molding structure, and has for its object to provide mechanism for permitting a wall to be formed from plastic material capable of hardening, as for instance concrete, cement or the like, comprising connected inner and outer walls having an air space between them, and having means for supporting reinforcements for the walls.

In the drawings: Figure 1 is a top plan view of the improved structure, Fig. 2 is a side view with parts broken away, Figs. 3 and 4 are sections on the lines 3-3, and 4-4, respectively, of Fig. 2, Fig. 5 is a perspective view of one of the contractible cores, Fig. 6 is a top plan view of a wall and the form showing the spacer bolts, Fig. 7 is a side view of Fig. 6, Fig. 8 is a perspective view of the interlocking connection showing the parts in one position, Fig. 9 is a similar view showing the parts in another position, Fig. 10 is a top plan view of the completed wall, Fig. 11 is a vertical section through the same, Fig. 12 is a perspective view of a modified form of core, Fig. 13 is a perspective view of one of the core supporting plates, and Fig. 14 is a partial horizontal section through the hopper.

The improved wall, as shown in Fig. 1, is formed of laterally spaced walls 1 and 1<sup>a</sup>, connected at intervals by transverse ties 3, and intercommunicating air spaces 4 are provided between the walls and the ties. The material forming the walls is poured between retaining or form walls the said form or retaining walls being composed of tongue and groove boards 5, which are supported by studding sections 6, held in spaced relation by the spacer bolts shown. The said bolts form the subject matter of my prior Patent, No. 1,108,888 filed Sept. 1, 1914, each comprising a rod 7 having one of its ends pointed and threaded, as indicated at 8. The rod is passed through registering openings in the studding sections 6, and the form plates 5 of one retaining form wall, transversely of the space between the retaining or form walls, and into threaded en-

agement with the wall plates and studding sections of the other form wall. A sleeve 9 of frusto-conical shape and having a threaded portion fits over the rod 7, and is threaded into an opening 10 in the studding section and wall plate, and the said sleeve is split over a portion of its length. At each side of the split the sleeve is provided with a cross head 11, and bolts 12 are passed transversely of the ends of the cross heads, and are engaged by nuts 13 on the opposite side, to clamp the split end of the sleeve on the rod.

The rod having a threaded engagement with one form wall, and the sleeve having a threaded engagement with the other form wall, and mounted to slide on the rod, it will be evident that the form walls may be spaced apart any desired distance, and may be clamped in this position by means of the bolts 12 and the nuts 13. The retaining walls are built up in this manner, the studding sections being arranged one above the other, and locked together by the spacing bolts, and a hopper is provided for insuring the proper insertion of the cement or concrete.

The hopper comprises a frame and a body of sheet material. The frame is sectional, consisting of similar sections. Each of the sections comprises a side member 17, and end extensions 17<sup>b</sup> integral with the side members 17. The side members are of angle material as shown, each consisting of substantially vertical portions 17 before mentioned, and a horizontal portion 17<sup>a</sup>, integral therewith, and the end extensions 17<sup>b</sup> have also angular extensions 17<sup>c</sup> at their lower edges. The sections of the frame are connected by a hood 20 of U-shape. The hood is of sheet material and the ends of the hood are flanged outwardly as shown at 21, and these flanges are secured to the end extensions 17<sup>b</sup> of the frame sections and to the sheet metal ends 16 of the hopper. The hopper is completed by side walls 14, which are hinged to the end walls at the top of the hopper, as indicated at 14<sup>a</sup>. The upper edges of the side walls 14 are beaded as shown, and the pintle or pivot rod of the hinge passes through the beads of the side wall. Each side wall has at each end an extension 15 fitting against the inner face of the adjacent end wall 16, and the side walls are adjustable toward and from the hood to vary the effective openings through

the hopper for the material to be poured. Slots 18 are provided in the end walls and in the extensions 17<sup>b</sup> of the frame, and bolts 19 are passed through the slots and through openings in the extensions 14<sup>b</sup>, and are engaged by nuts at the outer face of the hopper. It will be evident that when the nuts on the bolts are loosened the side walls may be swung toward or from each other to vary the width of the openings between their lower edges and the lower edges of the side walls of the hood. The air spaces 4 are formed by the cores 22. Each of the said cores is formed from an endless strip of sheet material, having the cross section of the air space desired when expanded.

Normally the side walls of the core fit upon each other, intermediate the ends of the core, as shown in Fig. 5, and at the right of Fig. 1, and these walls may be expanded by the expanding sticks 23. The said sticks 23 are square in cross section and of a diameter equal to that of the core when expanded, and the lower end of each stick is tapering, as shown at 24.

The cores 22 have a depth corresponding to the aggregate width of three of the form boards or plates 5, and they are arranged between the form walls in courses so to say, and the members of the courses are lapped or staggered with respect to the adjacent courses. Referring to Figs. 1 and 2 of the drawing, it will be noted that the spaces between the cores of the uppermost course are at the center of the cores of the preceding course. The cores are supported by plates 25 of suitable material, as for instance fiber board, the said plates being arranged transversely of the centers and ends of the cores and extending across the air space. Each of the plates 25, as shown more particularly in Fig. 1 extends from one form wall just beyond the air space, and each plate is at the center or end of the core which it supports. The cores are placed in the wall between the form walls, and are expanded by the expanding sticks 23. Two sticks are used for each core, and they are passed between the side walls of the core on opposite sides of the center. Each stick is pushed downward, until the pointed lower end 24 thereof is below the lower end of the core. The sticks are of such length that a portion of each stick will extend above the upper end of a core, and the openings 20 in the ends of the hopper permit the hopper to be moved longitudinally of the form wall between the same without interference by the sticks, the upper ends of the sticks passing through the openings.

The ties 3 that connect the walls 1 and 1<sup>a</sup> are at the tops of the cores and extend about half the depth of the cores. The rods 9 before mentioned extend through the tie walls. The hopper may be moved longitudinally

by sliding it along on the form walls, and the upper end of the expanding sticks 23 move through the passageway within the hood or shield 20, as shown in Fig. 3.

If desired the form walls may be arranged as shown in Figs. 6 and 7. In this construction, each of the walls consists of similar units arranged in courses, and with the courses one above the other. Each of the units comprises a substantially rectangular frame 26 composed of angle material, and a closing plate 27 connected to the frame. One end wall of each frame has a slot 28, and the opposite end wall is provided with a struck up tongue 29 for engaging the slot of the preceding frame. The slot and the tongue are so arranged with respect to each other, that when the lower side walls of the frames are in alinement the tongue will engage the lower end of the slot. The upper side edge of each frame is also provided with a plurality of slots 30, and the lower side wall of each frame is provided with tongues 31 struck up from the material of the side wall, for engaging the slots of the adjacent frame or unit of the preceding course. The opposite walls are held together by the spacing bolts shown in Figs. 1 to 4, and described above, and the cores 22 are used in the same manner, as are also the spacing sticks 23. The fiber boards 25 which support the cores are also used in the same manner.

In Figs. 10 and 11 a modified construction of wall is shown. In this construction the walls 32 and 32<sup>a</sup> are provided with intercommunicating air spaces 33, and the walls are connected by ties or bonds 34. The cores used are shown in Fig. 12. Each of the said cores 35 is similar to the core 22 shown in Fig. 5, except that at its upper edge the core is notched at each end, as indicated at 36. The cores are placed in between the form walls in the same manner as before mentioned, and they are supported by fiber boards 25, and the boards are arranged at the ends of the cores instead of at their centers.

Each of the supporting boards is arranged with respect to the wall in the same manner as shown in Fig. 1, but instead of being at the center of a core, each board assists in supporting two cores. The notched ends of the cores are for permitting the insertion of core blocks 37. These blocks are arranged in the notches 36 of two adjacent cores, and the blocks thus assist in spacing the cores.

In using the improved structure, the form walls are built a portion at a time. In the construction of Figs. 1 to 4, three form boards are set up at once, and the cores 22 are placed on the wall already formed. Supporting plates 25 are arranged below the adjacent ends of the cores 22, the said plates assisting in supporting the cores. A core block 37 is arranged on the alternate plates 25, between the adjacent cores, the block ex-

tending about half the height of the cores. The cores are expanded by pushing down the spreading sticks 23, and after the wall has been set up as above described, the hopper is placed at the beginning of the wall, and the first section is poured and tamped. The hopper is then moved and the second section is poured and tamped. This is continued until the complete length of the wall has been gone over. After the wall has set sufficiently, the cores are withdrawn, by withdrawing the spreading sticks. When this is done the cores collapse intermediate their ends, as shown at the right of Fig. 1, and they may be easily withdrawn. The succeeding section of wall is then built in the same manner.

The spacing bolts hold the wall forms from closing in or spreading, and the hopper not only acts as a guide for the insertion of the cement, but also as a guide for the spacing sticks. It will be understood that two spacing sticks are used for each full length of core, and that the lower pointed end of each stick extends into the air space formed by the core of the next lower course. The sticks also center and position the upper side of the core.

I claim:

1. A mold for building walls of plastic material capable of hardening and consisting of spaced parallel walls separated by a dead air space, said mold comprising oppositely arranged walls, each wall being composed of units, and the units being arranged in superposed courses and in alinement horizontally and vertically, each unit comprising a substantially rectangular frame of angle material, hollow cores arranged midway between the walls for providing the dead air space, and a filling of sheet material secured to the frame, and a hopper for permitting the pouring of the plastic material, said hopper comprising a frame of angle material and having a portion extending outwardly to rest upon the upper edges of the form walls and a portion inclined outwardly at an acute angle to the first-named portion, the end walls of the hopper having notches at their centers and in their lower edges, and a substantially U-shaped shield for preventing the entrance of the plastic material into the hollow cores extending longitudinally of the hopper and having its ends secured to the end plates around the openings, and side plates adjustably connected to the frame at their lower edges for inward and outward swinging movement.

2. A core for use in building cellular walls of plastic material, the cores being of resilient sheet material and of elliptical cross section when expanded, the side walls of the core normally lying in contact and adapted to be spread into parallelism by

spacer bars, each core being notched at the ends of its upper edge.

3. A core for use in building cellular walls of plastic material, the cores being of resilient sheet material and of elliptical cross section when expanded, the side walls of the core normally lying in contact and adapted to be spread into parallelism by spacer bars.

4. A core for use in building cellular walls of plastic material capable of hardening, of sheet material and of elliptical cross section when expanded, the side walls normally contacting in combination with a removable means for expanding the same by inserting between said walls.

5. Apparatus for building cellular walls from plastic material capable of hardening, and comprising oppositely arranged sectional form walls, spacer bolts for holding the form walls in spaced relation, cores of elliptical cross section, the side walls of the cores normally contacting intermediate their ends, spacer bars for expanding the core blocks, plates for supporting the cores, the cores being arranged in courses and the cores of each course lapping the cores of the succeeding course, said cores being notched at their ends and at their tops to support core blocks lapping the ends of adjacent cores, and an adjustable hopper having a covered longitudinally extending passage at its inner side for permitting the hopper to pass over the cover and spacing bars.

6. Apparatus for building cellular walls from plastic material capable of hardening, and comprising oppositely arranged sectional form walls, spacer bolts for holding the form walls in spaced relation, cores of elliptical cross section, the side walls of the cores normally contacting intermediate their ends, spacer bars for expanding the core blocks, plates for supporting the cores, the cores being arranged in courses and the cores of each course lapping the cores of the succeeding course, said cores being notched at their ends and at their tops to support core blocks lapping the ends of the adjacent cores.

7. In an apparatus for building cellular walls from plastic material capable of hardening, a core of approximately elliptical cross section and having its side walls normally adjacent and capable of being moved away from each other to expand the core, and spacer bars adapted to be inserted between the adjacent side walls to separate the said walls to expand the core, said bars tapering at their lower ends to permit their easy insertion between the walls.

8. In an apparatus for building cellular walls from plastic material capable of hardening, a core of approximately elliptical cross section and having its side walls normally adjacent and capable of being moved

away from each other to expand the core, and spacer bars adapted to be inserted between the adjacent side walls to separate the said walls to expand the core.

5 9. In an apparatus for building cellular walls from plastic material capable of hardening, a core of approximately elliptical cross section and having its side walls normally adjacent and capable of being moved

10 away from each other to expand the core, and spacer bars adapted to be inserted between the adjacent side walls to separate the said walls to expand the core, the spacer bars being of greater length than the depth

of the cores and adapted to extend above the tops of the cores, and a hopper for permitting the material to be poured and having a substantially U-shaped hood or shield extending longitudinally of the hopper at the bottom thereof and of a width corresponding to the width of the cores and of a height corresponding to the excess height of the spacer bars over the cores. 15 20

GEORGE COUSINS.

Witnesses:

CHAS. H. GRIGGS,

W. J. FRANKLIN.