

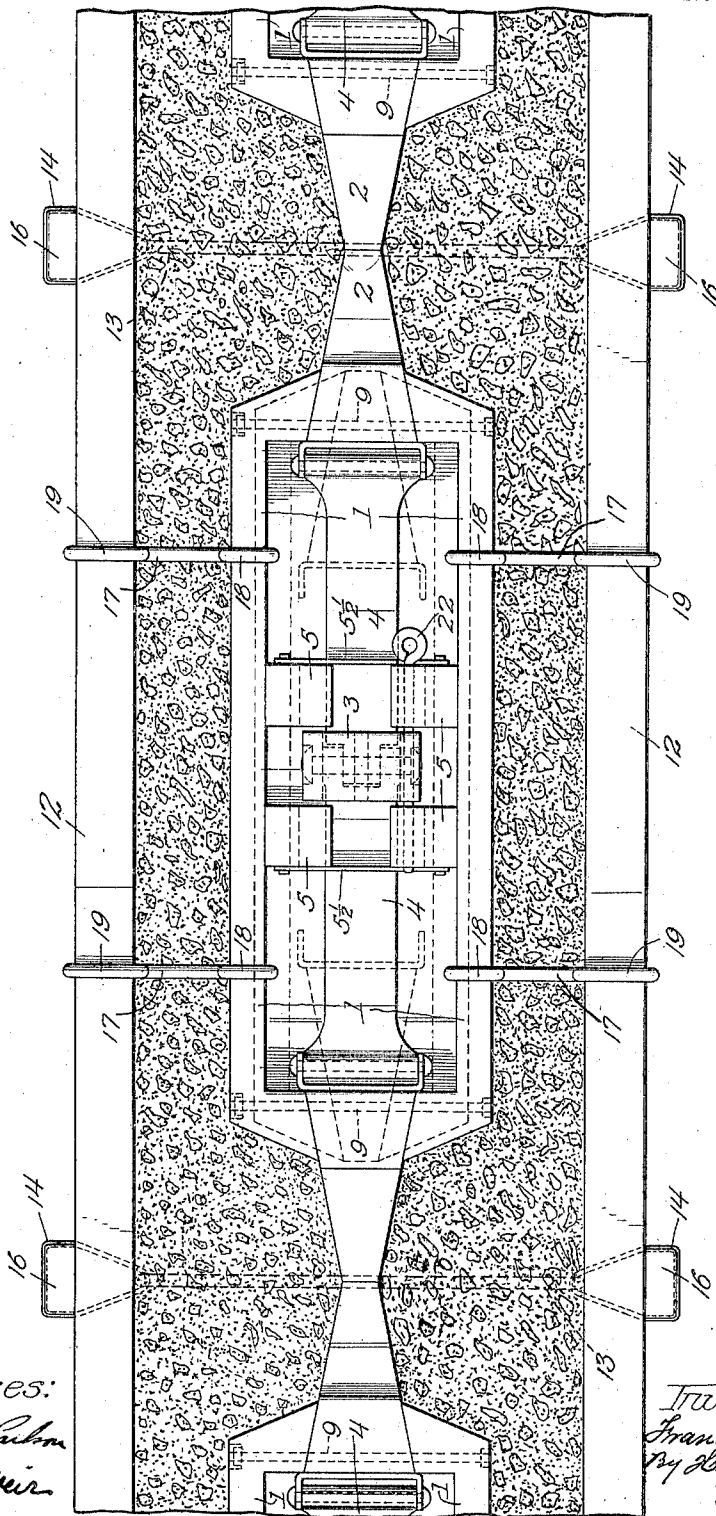
F. L. NORTON.
FORM FOR CONCRETE WORK AND STRUCTURES PRODUCED THEREFROM.
APPLICATION FILED OCT. 30, 1918.

1,321,938.

Patented Nov. 18, 1919.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Arthur W. Carlson
Robert W. Wier

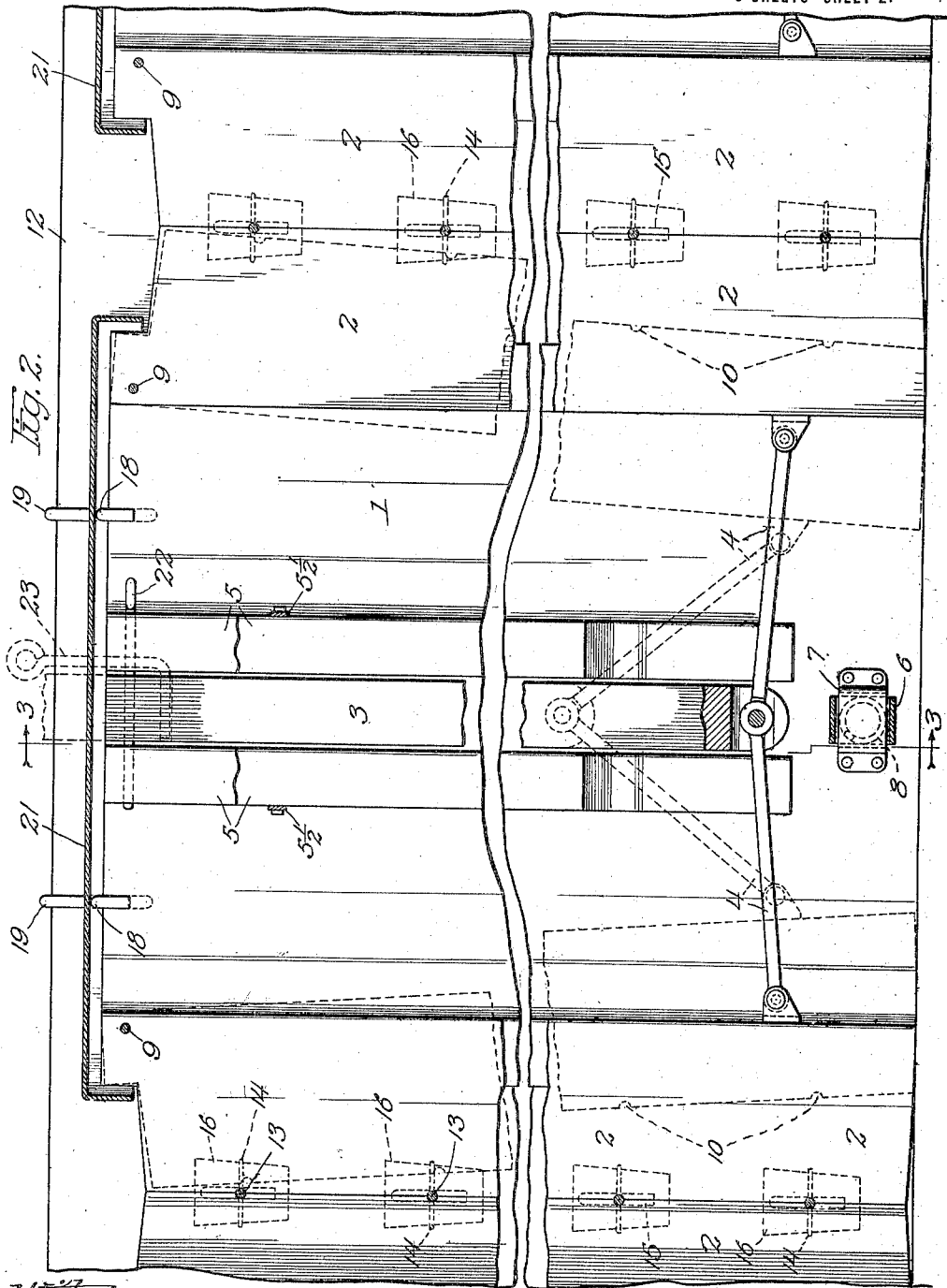
Inventor
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5 SHEETS—SHEET 2.



Witnesses:
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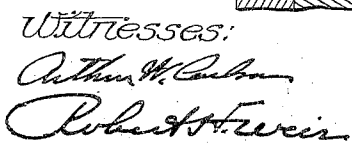
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Fig. 3.

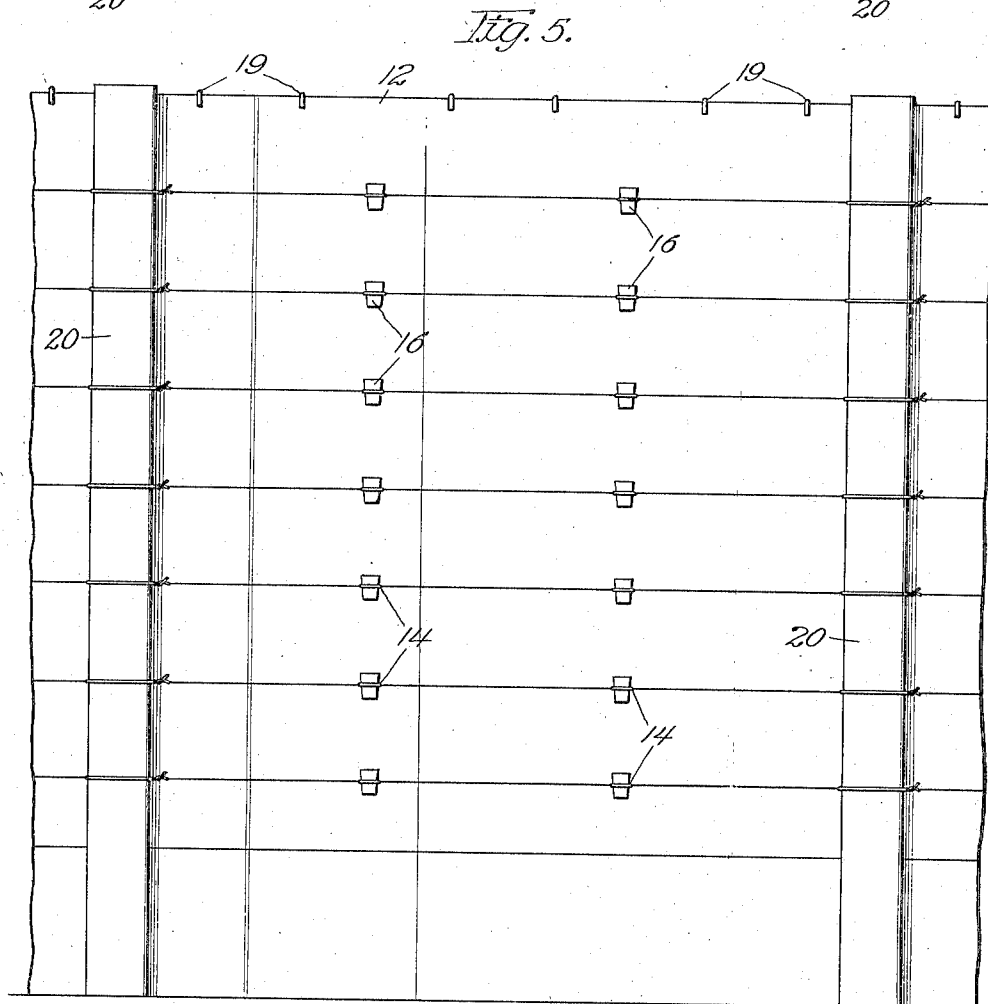
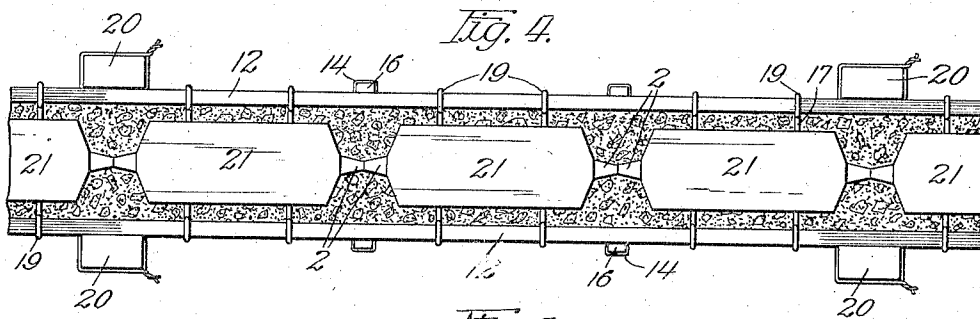


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Frank L. Norton
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Witnesses:
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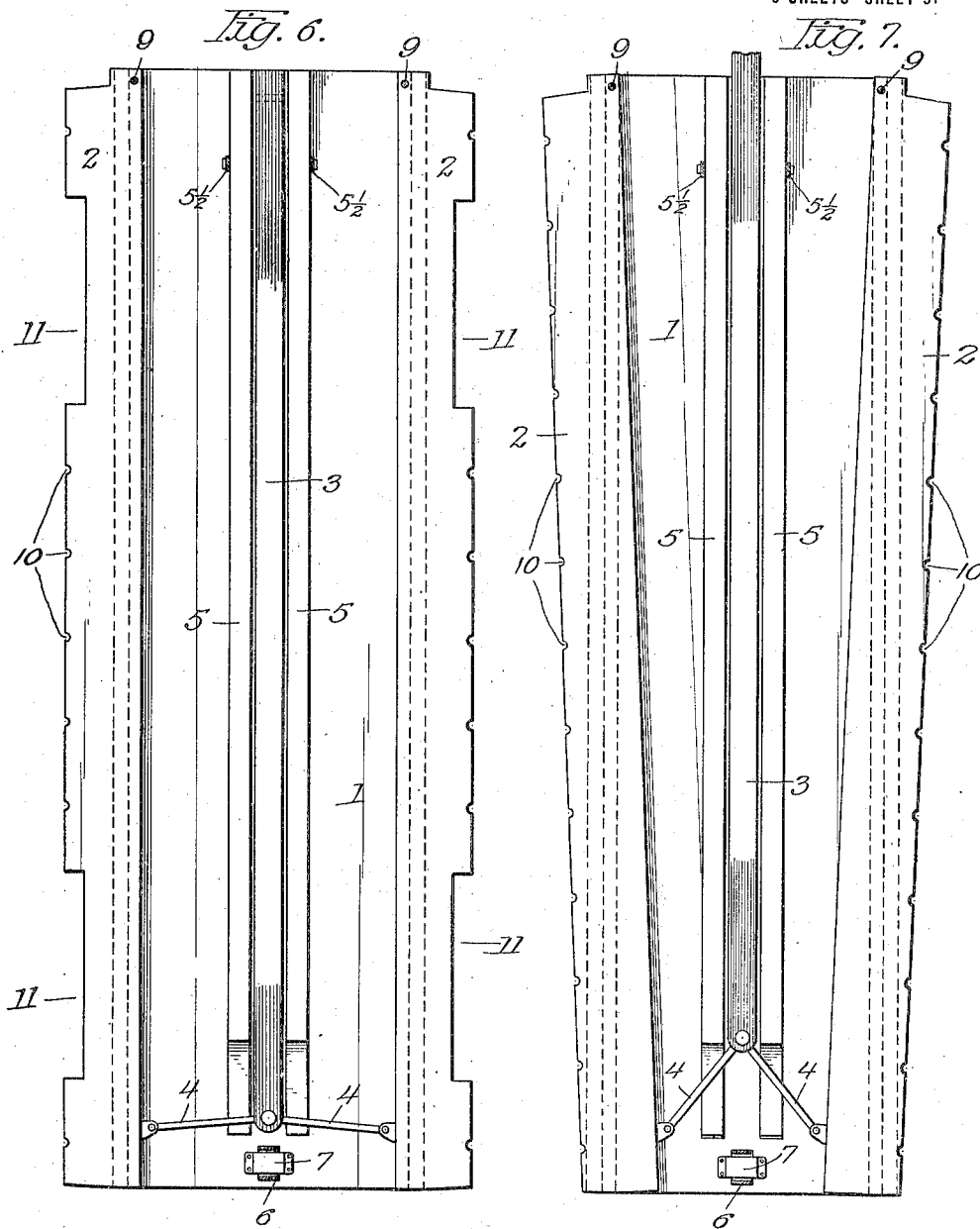
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5 SHEETS—SHEET 5.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

FRANK L. NORTON, OF LOS ANGELES, CALIFORNIA.

FORM FOR CONCRETE WORK AND STRUCTURES PRODUCED THEREFROM.

1,321,938.

Specification of Letters Patent.

Patented Nov. 18, 1919.

Application filed October 30, 1918. Serial No. 260,384.

To all whom it may concern:

Be it known that I, FRANK L. NORTON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles, in the State of California, have invented certain new and useful Improvements in Forms for Concrete Work and Structures Produced Therefrom, of which the following is a description.

My invention belongs to that general class of devices known as concrete forms, consisting of suitable devices for confining the plastic concrete in the desired conformation until it shall have had an opportunity to set. It particularly consists in a peculiarly constructed form acting as a core, which after the cement or concrete has set, may be readily removed, leaving a permanent space. Owing to the peculiar contour in the preferred construction, a wall constructed by the aid of my improved form will in itself contain novel features of distinct value.

The wall itself, constructed by the aid of my improved form, consists in a wall which might be termed cellular in its construction, that is, at measured points a cell extends from a point near the top to a point preferably near the bottom, the contiguous walls being connected by a narrowed portion. The two outer walls resulting from such construction are securely tied together at suitable points so as to maintain the whole in a solid and rigid form. By this construction there is an inner wall, and spaced therefrom an outer wall, the space serving for the circulation of air to a greater or less extent, and preventing moisture extending through to the inner wall where it may gather in a form that is usually termed "sweating", resulting in a wet, damp room.

The object of my invention is to produce a form of the type described that will be effective for the purpose set forth in producing the particular type of wall described at low cost and at a considerable saving of time.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like or similar reference characters indicate like or corresponding parts,

Figure 1 is a top plan view of my improved form in position with retaining boards substantially ready for a pour;

Fig. 2 is a sectional view substantially on line 2—2 of Fig. 3;

Fig. 3 is a sectional view substantially on line 3—3 of Fig. 2;

Fig. 4 is a top plan view of a set up; illustrating the position of a group or plurality of forms, with covers over the top ready for a pour;

Fig. 5 is a side elevation of the same showing the outer boards of the particular part shown in Fig. 4;

Fig. 6 is a side elevation of my improved form with the side boards removed to disclose the interior construction when the form is extended in place, the wedge boards being slightly modified to provide concrete connecting ties; and

Fig. 7 is a similar view showing the same with the wedge boards as first shown and partially collapsed for the purpose of withdrawing the form from the wall.

As best shown in Figs. 1, 3, 6 and 7, 1—1 are the side boards of a form, suitably spaced apart to maintain between them the controlling mechanism for the device. These boards are spaced apart at the edges by wedge members 2—2, which may be moved inward or outward from toward the center to vary the distance between the boards 1—1. As clearly shown in Figs. 2, 6 and 7, a longitudinally movable bar 3 extends from a point near the top of the form downward, with its lower end pivotally connected to toggle links 4—4, or equivalent means, having their outer ends pivotally connected to the inner walls of the wedge pieces 2—2. The bar 3 is suitably retained in proper relative position by means of guide pieces 5—5 carried by the side boards of the device. The side boards at or near the bottom are preferably resiliently connected together by means of cooperating U-shaped links 6—7, confining between them a spring 8, as best shown in Fig. 3. The free ends of the U-shaped members extend in opposite directions and are attached to the side members 1 so as to serve to operatively connect the two members to prevent accidental disengagement, while the resilient member permits the ends of the two boards to move nearer together when the wedge members are withdrawn inward, as shown in Fig. 7, permitting the withdrawal of the form. Near the top suitable slotted links 5½ may be secured to the guides 5—5, permitting the collapsing of the side boards at the top, but preventing excess

movement when the pins, or bolts 9—9 are withdrawn. At the upper end the wedge members 2 are preferably secured between the side members 1 by means of bolts or equivalent parts 9, permitting a pivotal action as the lower ends of the wedge members are drawn together, as shown in Fig. 7. The pins or bolts 9 may be in a suitable form so that they may be readily withdrawn if desired, permitting the upper end of the wedge members to be drawn inward if desired, and thus permitting the collapse of the side boards at the upper part as well as at the bottom.

In the preferred construction shown, the outer edges of the wedge members are provided with a series of indentations or equivalent forms 10, which in practical operation are simply indentations suitable to seat a spacing and tie rod while the devices are in position for a pour. These indentations 10 may be spaced apart any desired distance, but I have found it convenient to make them about six inches in order that I may use side boards of that general width, as hereafter described.

In some instances it may be preferable to cut away a portion of the edges of the wedge member at one or more points, so as to permit the concrete to flow therethrough, inclosing the spacing wires and constituting a plurality of concrete ties extending from one outer wall to the other. In addition to this, the concrete enveloping the tie rods protects the same from rusting. Such cut away portions are indicated at 11, Fig. 6. One or more such cut away portions may be employed as desired, or if preferred, they may be dispensed with.

Calling attention particularly to Figs. 1 and 3, it will be seen that the outer retaining boards 12—12, preferably of uniform width, are laid up edge-wise, the form being centrally maintained between them. At suitably spaced intervals, preferably at the meeting edges of the wedge boards, links 13 extend from one side to the other on the interior, being positioned in the indentations 10 on the edges of the wedge boards. A wire loop 14 at each end is engaged on the inside by the transversely bent hooks 15 on the ends of said rods, and extending through to the exterior a wedge 16, driven through the loop, serves to bind the boards of the two sides firmly together during the pouring and setting of the concrete. Bent rods 17, or their equivalents, at the top hook over the upper edge of the side boards as at 18, and over the upper edge to the outside board 12 as at 19.

In addition to the wedges 16, at suitable intervals a piece of timber, for illustration a piece two by four inches, may extend from the top to the bottom of the form as shown at 20 in Figs. 4 and 5. This piece extend-

ing from the bottom to the top of the boards serves to retain them in suitable position and support them against outward pressure or other undesirable transverse bulging or movement. In practice my form is of such size that the wedges 16 are spaced apart substantially sixteen inches, as shown in Figs. 4 and 5, while the posts 20 are spaced apart substantially forty-eight inches. Of course these distances and sizes may be modified as may be desired. I prefer to provide a cover 21 for each of the forms so that before pouring this cover may be placed in position, preventing any accidental entrance of the concrete to the interior of the mold, thus interfering with its operation as the concrete sets.

The preferred size of the forms generally used is substantially sixteen inches from edge to edge of the wedge pieces 2 when the form is open, by forty-two inches in height. This is found to be a convenient size for general use.

Any preferred means may be employed to lock the sliding bar 3 in suitable position when the form is in operative condition, as shown in Figs. 1 and 6. As shown, this may be accomplished by means of a pin or bolt 22 passing through a suitable aperture in the guides 5—5 and through the upper part of the bar 3. The bar may be released and the form removed by withdrawing the pin 22, when a suitable tool 23 (Fig. 2) may be inserted in an aperture in the upper end of the bar, thereby enabling it to be withdrawn, and the lower ends of the wedge boards 2 drawn together, substantially as shown in Figs. 2 and 7. The wedge boards 2 may be readily released at the top, permitting them to move inward and allow the upper ends of the side boards 1—1 to move closer together by removing the pins 9—9. Such is not generally necessary, however, as the collapsing of the lower end of the form is sufficient for the purpose.

In practical use enough forms are usually employed to extend around the wall of the building. They may be of such size as may be desired to secure the dimensions required. The first pour preferably fills the form to a point from one to two inches below the top of the center form. After the concrete has set, the central form is collapsed as set forth and withdrawn. A second form is then built up substantially as described, and the operation repeated until the wall is completed.

The central form or core may be made of wood treated with oil, paint, tar or other water proofing material, or galvanized sheet metal or its equivalent may be used for the side pieces, with wood or iron wedge pieces if desired. The wall constructed is monolithic in type, and is preferable for many constructions. The tie bars 13 are

preferably painted or otherwise coated with a protecting material before they are placed in position. The width of the air space between the two walls at the approximate meeting edges of the wedge blocks 2—2, as shown in Fig. 1, is preferably substantially an inch, and as before mentioned and as shown in Fig. 6, at certain points the concrete may extend through this opening, incasing the rods 13 and serving to connect the two outer walls.

In erecting the form it will not be necessary to use nails or scaffolding, and the wall thus formed may be finished with a coat of plaster direct upon the concrete without the necessity of lathing. Any desired finish for the outside wall may be secured by forming the outer boards for that purpose.

The same central forms may be employed with substantially any thickness of wall, the thickness of the wall depending upon the length of the tie rods 13, and hence the distance from side to side of the retaining outer boards. It is also obvious that the thickness of the wall may thus be decreased at any desired point by simply employing shorter tie rods 13 as the form is set up. Thus a thick wall may be constructed up to the point where the floor joists are placed. Here the wall may be thinner, leaving a shelf for the ends of the joist to rest upon, while if desired the same course may be followed with the succeeding floors. Any suitable means for reinforcing the wall may also be employed, such as using wire netting, steel rods or their equivalents, positioning them in the outer space before the pouring. The great importance of my invention rests in the fact that the wall is monolithic and composed of two walls suitably spaced apart and firmly tied together, so as to provide a ventilating air space between the two substantially throughout, thus insuring a dry inner wall. Also that the thickness of the wall may be varied as desired. In addition to this that the means described are simple and effective for the purpose, and that the wall may be erected therewith at a minimum cost with a maximum of efficiency for the purpose described.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

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

1. In a form of the kind described, relatively collapsible side pieces, and movable wedge pieces arranged between the approximate outer edges of the sides adapted by

their position to regulate the distance between the side pieces, in combination with a longitudinally movable bar positioned between the side pieces, and connecting means between the bar and the wedge pieces, whereby the position of the wedge pieces may be adjusted by the movable bar to control the relative position of the side pieces.

2. In a form of the kind described, relatively collapsible side pieces, means for maintaining the operable relative positions between the side pieces, and movable wedge pieces arranged between the approximate outer edges of the sides adapted by their position to regulate the distance between the side pieces, in combination with a longitudinally movable bar positioned between the side pieces, and link members connecting the bar with the wedge pieces, whereby the position of the wedge pieces may be adjusted by the movement of the bar to control the relative position of the side pieces.

3. In a form of the kind described, relatively collapsible side pieces, resilient means connecting the side members near one end thereof, and movable wedge pieces arranged between the approximate outer edges of the sides adapted by their position to regulate the distance between the side pieces, in combination with a longitudinally movable and guided bar positioned between the side pieces, and link members connecting the bar with the wedge pieces, whereby the position of the wedge pieces may be adjusted by the movement of the bar to control the relative position of the side pieces.

4. In a form of the kind described, relatively collapsible side pieces, resilient means connecting the side pieces near one end thereof, means loosely connecting the opposite end of the side pieces, wedge pieces arranged between the approximate outer edges of the sides adapted by their position to regulate the distance between the side pieces, said wedge pieces being pivotally carried near the outer end of the side pieces, in combination with a longitudinally movable and guided bar positioned between the side pieces, and link members pivotally carried by the lower end of the bar and extending to and pivotally engaging the lower portion of the wedge pieces, whereby the position of the wedge pieces may be adjusted to control the relative position of the side pieces.

5. In a form of the kind described, mating side pieces, resilient means connecting said side pieces near one end and a loosely retaining means connecting them near the other end, centrally disposed longitudinal guiding means between the side pieces, and movable wedge pieces arranged between the approximate outer edges of the sides

adapted by their position to regulate the distance between the side pieces, in combination with a longitudinally movable bar positioned between the guiding means and extending from a point near the top to a point near the bottom of the side pieces, connecting links between the lower end of the bar and the approximate faces of the wedge pieces, and means for maintaining the upper ends of the wedge pieces in position.

6. In a form of the kind described, mating side pieces, means for maintaining said side pieces in relative operable position, transversely movable wedge pieces arranged between the approximate outer edges of the sides adapted by their position to regulate the distance between the side pieces, the outer edges of said pieces at one or more points being cut away to permit concrete to flow thereby, in combination with a longitudinally movable and guided bar positioned between the side pieces, extending from a point near the upper part of the form to a point near the lower portion, and operable means connecting the lower end of the bar to the adjacent walls of the wedge members, substantially as described.

7. Mating forms for concrete constructions formed to be placed edge to edge in operable position, each of said forms comprising side pieces, means for maintaining said side pieces in relative operable position, transversely movable wedge pieces arranged between the approximate outer edges of the sides adapted by their position to regulate the distance between the said pieces, the outer edges of said wedge pieces at spaced distances being formed to receive transversely extending tie rods partially supported between the approximate meeting edges of the wedge members of a pair of forms, in combination with a longitudinally movable and guided bar positioned between the side pieces of each form, extending from a point near the upper part of the form to a point near the lower portion, and operable means connecting the lower end of

the bar to the adjacent walls of the wedge members, substantially as described. 50

8. Coöperating core forms for concrete constructions adapted to be placed edge to edge in making up the concrete form, each of said core forms comprising mating side pieces, means for maintaining said side pieces in relative operable position, transversely movable wedge pieces extending between the approximate outer edges of the sides adapted by their position to regulate the distance between the side pieces, the outer edges of said wedge pieces at one or more points being cut away to permit concrete to flow thereby, and the meeting edges of the approximate edges of the wedges of a pair of said forms being constructed to receive transversely extending tie rods, in combination with a longitudinally movable and guided bar positioned between the side pieces of each unit, extending from a point near the upper part of the form to a point near the lower portion, and operable means connecting the lower end of the bar to the adjacent walls of the wedge members, substantially as described. 60 65 70

9. In a core form of the kind described, relatively collapsible side pieces, and movable members wedge-shaped in a horizontal plane coöperating with the side pieces to close the same against the entrance of concrete and to regulate the distance between the side pieces, in combination with a longitudinally movable bar positioned between the side pieces, means connecting the bar with the wedge members, whereby as the longitudinally movable bar is operated, the said wedge members will be moved inward toward each other or forced outward to separate the side pieces. 75 80 85

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses. 90

FRANK L. NORTON.

Witnesses:

A. H. McDONALD,
J. H. BEST.