Feb. 19, 1929. 1,702,659

J. W. MILES

WALL BUILDING FORM

Filed Aug. 13, 1927 3 Sheets-Sheet 1

Fig. 3.

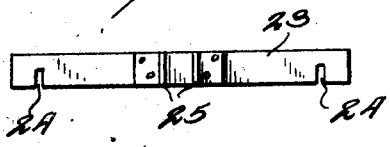
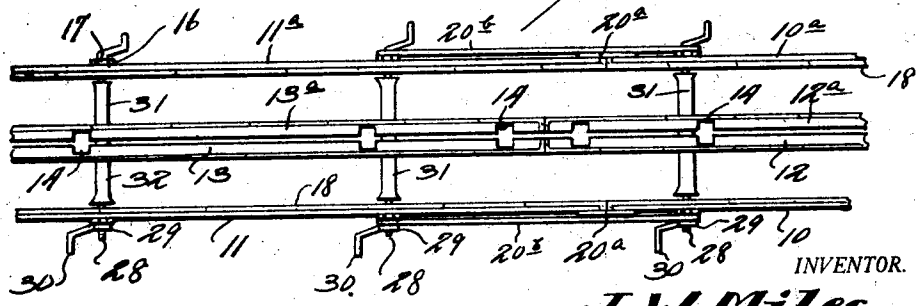


Fig. 4.



Fig. 1.

Fig. 2.



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Fig. 5.

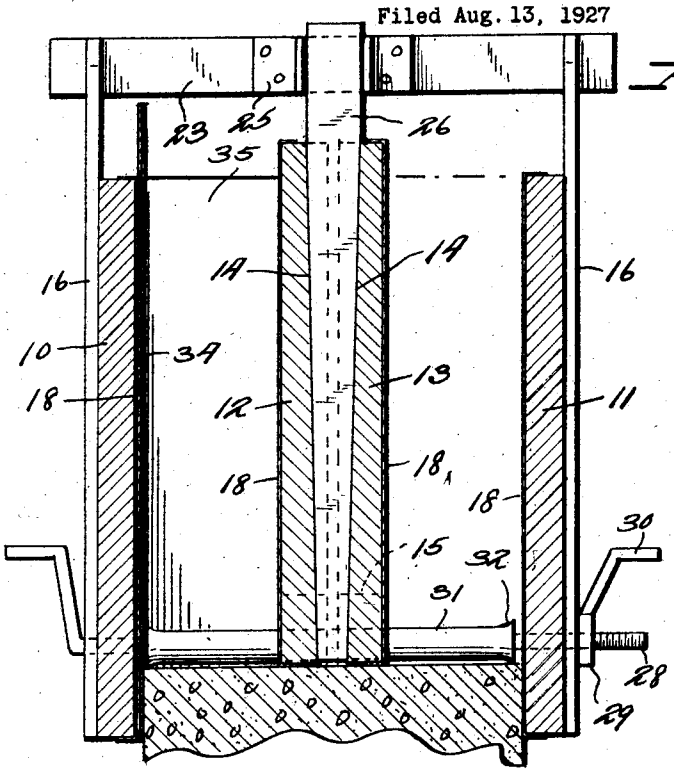


Fig. 7.

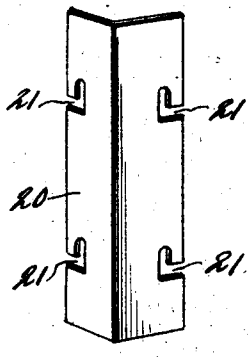


Fig. 6.

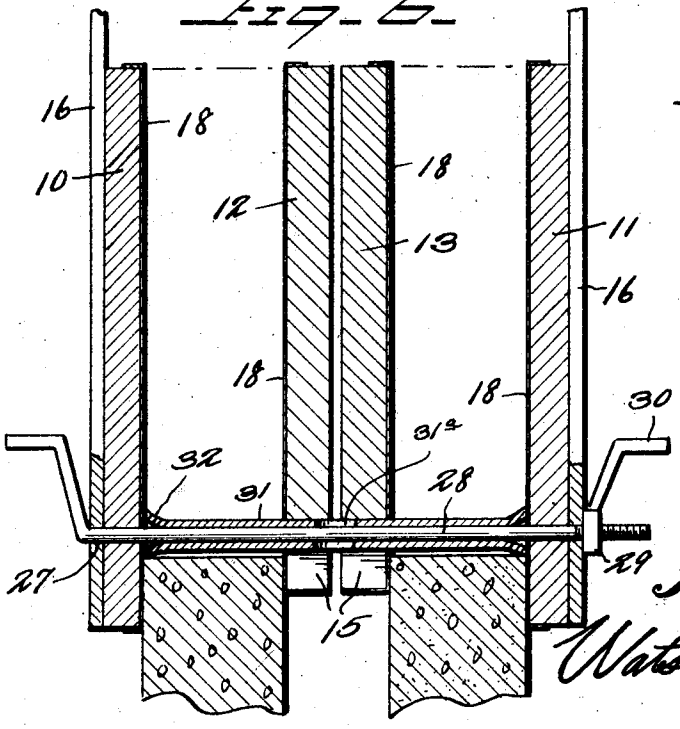
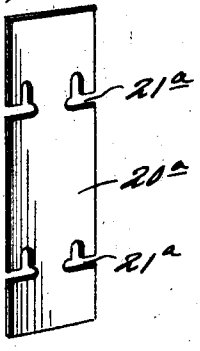


Fig. 8.



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WALL BUILDING FORM

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Fig. 9.

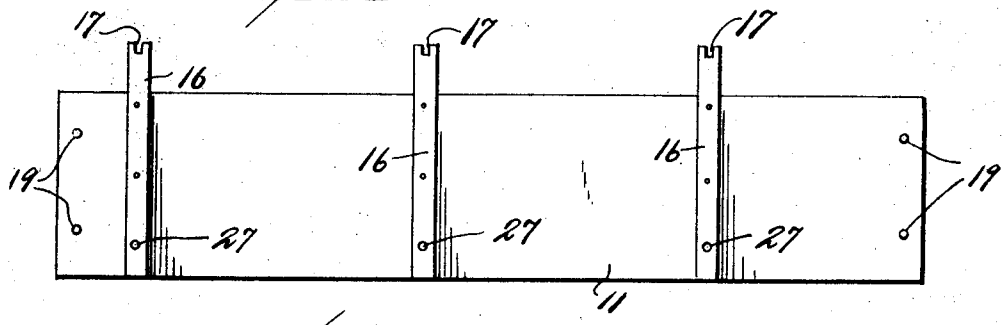


Fig. 10.

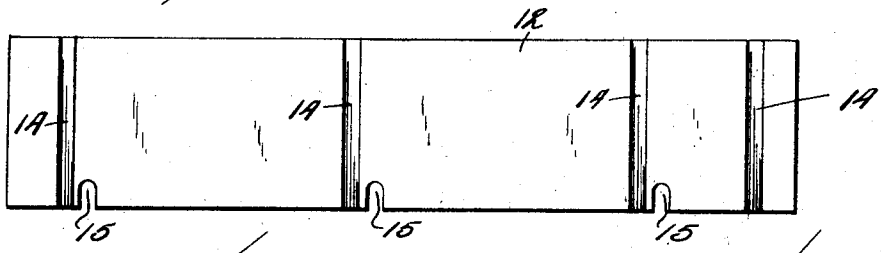


Fig. 11.

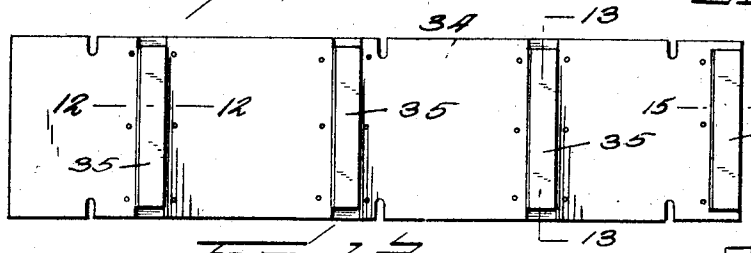


Fig. 15.

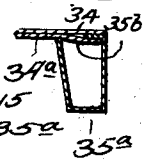


Fig. 12.

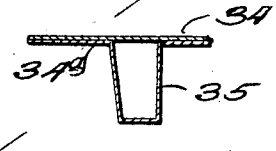


Fig. 13.

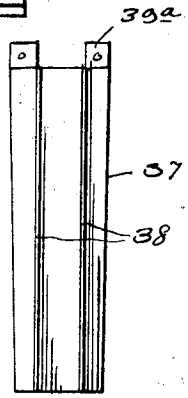
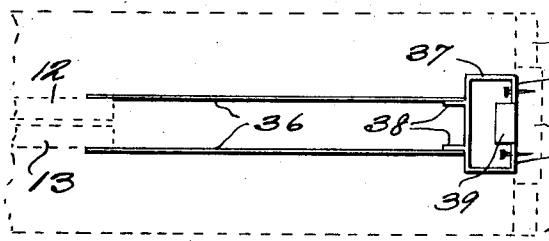


Fig. 14.



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Patented Feb. 19, 1929. 1,702,659

UNITED STATES PATENT OFFICE.

JOHN W. MILES, OF DUQUESNE, PENNSYLVANIA.

WALL-BUILDING FORM.

Application filed August 13, 1927. Serial No. 212,759.

This invention relates to forms for building concrete walls, and the general object of the invention is to provide forms which may be readily set up and as readily taken down and by which the walls of a building may be cast of concrete with an air space left in the middle of the wall and extending vertically upward and communicating adjacent the foundation, that is in the second course above the foundation or at any other desired point or course, with the outside air by transverse tubular ties so that the air may pass into the air space at the lower portion thereof and rise upward through the air space and be discharged at the upper end of the wall, the two separated portions of the wall above the tubular ties above referred to being connected by ties which are closed at their open ends by concrete when the wall is finished.

A further object of the invention is to provide forms of this character which may be used to form walls of different lengths, which may be readily shifted, which may be readily put together to form the corner of a building, and which may be used in connection with certain false or temporary work to leave proper spaces for door and window frames.

A still further object is to provide oppositely disposed wall forms with detachable cores used for the purpose of forming recesses for the ends of the floor joists.

Another object is to provide means whereby the mold sections into which the concrete is rammed may be held in proper spaced relation and against any tendency to spread.

Other objects have to do with the particular details of construction of these forms and mold sections and the particular arrangement of the parts as will hereinafter more fully appear.

My invention is illustrated in the accompanaying drawings, wherein:—

Figure 1 is a top plan view of a wall mold constructed in accordance with my invention;

Figure 2 is a like view to Figure 1 but showing the sections disposed in alignment;

Figure 3 is an elevation of one of the ties of the mold;

Figure 4 is a top plan view thereof;

Figure 5 is a vertical sectional view through the mold or form showing the manner in which the wedges are used;

Figure 6 is a like view to Figure 5, the section being taken, however, beyond the wedges;

Figure 7 is a perspective view of one of the corner angle irons;

Figure 8 is a perspective view of the iron used where the sections are placed in alignment with each other;

Figure 9 is an outside face view of one of the outer sections, as the section 11;

Figure 10 is an inner face view of one of the core sections;

Figure 11 is an inner face view of one of the sheet metal sections used for forming joist recesses;

Figure 12 is a section on the line 12—12 of Figure 11;

Figure 13 is an elevation of the form for the weight pocket;

Figure 14 is a fragmentary detail top plan view showing the manner in which the window casings are formed;

Figure 15 is a section on the line 15—15 of Figure 11.

In Figure 1, I have illustrated the mold sections of my invention as used to form two sides of a building and a corner thereof. It will be understood, however, that the sections may be used to form a straight wall just as well in a manner which will be later stated.

As illustrated, my improved building form comprises outer and inner mold sections 10 and 11, these being practically alike, but the section 10 being shorter than the section 11. Conjoined with these sections 10 and 11 are the sections 10^a and 11^a. The sections 11 and 11^a are longer than the sections 10 and 10^a so that the sections may be used to form the corner of a building, but these sections may be also placed with the sections 10 and 11 on the exterior of the wall and the sections 10^a and 11^a on the interior of the wall where a straight section of wall is being formed (see Figure 2).

Coacting with the sections 10 and 11 or 10^a and 11^a are the inner core sections 12 and 13 and 12^a and 13^a. These core sections 12 and 13 have a length somewhat greater than the sections 10 and 10^a but shorter than the sections 11 and 11^a so that they may turn the corner where the corner is being molded. These sections 12 and 13 or 12^a and 13^a are formed at intervals with vertical grooves 14 upon their inner faces (see Figure 10) and with vertical slots 15 extending upward from the lower edge of the section. The exterior faces of the sections 10 and 11 or 10^a and 11^a have upstanding braces 16 each notched at its upper end, as at 17. These braces are of

iron. The sections may be made of wood with a galvanized iron facing 18 which is attached to the wood in any suitable manner.

The ends of the sections 10 and 11 or 10ª and 11ª are provided with the outwardly projecting bolts or screws 19, these being disposed a distance from the adjacent ends of each section equal to the thickness of the section, as shown best in Figure 1, so that at the inside corners these screws may form stops holding the sections 10 and 10ª, for instance, in proper angular position, and where an angle is to be formed angle irons 20 are used, these irons being formed with bayonet joint slots 21 through which these screws may pass. By loosening the screws, it is obvious that the angle iron may be taken off to permit the sections to be released from their engagement with each other. Where the sections are disposed one in advance of the other in a straight line, as in forming a straight section of wall, the flat plates 20ª are utilized having the bayonet slots 21ª through which the screws 19 engage. While these angle plates are used upon the outside corner of the builder, no such angle plates need be used upon the inside corner. Thus if anything is a little out of square, the inside corner can give a little.

For the purpose of holding the sections 10 and 11 in spaced relation against the pressure of the concrete when it is rammed home, I provide the transverse locking bars 23 shown in Figure 3, each of these locking bars being adapted to be inserted in the corresponding slot 17 and each of these locking bars being slotted, as at 24, so as to interlock with the bars 16. Each of these locking bars is formed with outstanding lugs 25 for the purpose of supporting the wedges 26 which extend downward through the channels 14; these channels 14 confronting each other when the core sections 12 and 13 are placed in confronting relation, as shown in Figure 5. These wedges will hold the core sections spaced apart the desired distance to form a central air space in the wall. The sections 10 and 11 and 10ª and 11ª are formed with transverse apertures 27 for the passage of bolts 28. These bolts 28 may carry the nuts 29, one of these nuts having a handle 30 whereby it may be readily unscrewed. The bolts 28 pass through tubular tie rods or tie bars 31. These tie rods in the second course above the foundation are ten inches long so as to extend entirely through the wall and are perforated at the center, as at 31ª, (see Figure 6) so that after the wall is formed air may enter through the ends of the tubes 31 and pass upward into the space between the inner and outer sections of the wall so as to secure proper ventilation, as will be later stated. Above the second course these tie rods are only nine inches long. All of the tie bars are preferably flared at their ends so that the tie bars interlock with the concrete placed between the mold sections. These tie bars are made of ordinary pipe and may be made of scrap pipe and the flaring is very readily accomplished in an obvious manner. Thus the tie bars are very cheaply made and of the most ordinary materials.

It will be seen that these tie bolts and the tie rods are disposed adjacent the lower margins of the mold sections, while the locking bars 23 engage the upper ends of the vertical members 16 and hold the mold sections from spreading. Used in connection with the mold sections are the bulkheads 33 which are engaged with the ends of the mold sections 10 and 11 and 10ª and 11ª by means of the angle irons 20 previously described. Also used in connection with the mold sections and adapted to be applied upon the inner faces of the sections 10 and 11 or 10ª and 11ª are the joist pocket core plates. These, as shown in Figure 12, consist of an outer plate 34 and an inner plate 34ª, the inner plate being narrower than the outer plate so that the outer plate will project above and below the inner plate and this inner plate being formed with the inwardly projecting joist pocket cores 35. Except as hereafter stated, these pocket cores 35 are disposed at a distance of sixteen inches on centers, each core having a straight side and an inclined side. The last core 35ª, however, is detachable but when in place is disposed at a less distance than sixteen inches from the next adjacent core 35. This core 35ª is formed with a lug 35ᵇ which is adapted to be inserted between the outer and inner sheets 34 and 34ª.

There are two of these core-supporting plates, one equal to the length of the section 11 and the other equal to the length of the section 10, and the short one alone has the removable core form 35ª. The two plates from which the core support is formed are of galvanized iron and the two plates together have a thickness of about 1/8″. The two sheets are attached together in any suitable manner and when stood on edge are two inches higher than the outside sections of the builder, that is the sections 10 and 11 or 10ª and 11ª. Thus when in place the sheets project above the builder two inches. Thus, as shown in Figure 5, the joist form 35 will rest immediately upon the previously formed concrete portion of the wall and the upper end will project above the side of the form about two inches, as before stated.

In order to explain why this upward projection is necessary, I will have to explain just how the forms are removed and re-set. After the builder has been tamped tightly full of concrete, then the wedges should be pulled out, the bulkheads taken off, the core taken out, the angle irons 20 removed, the handled nuts removed from the tie rods or bolts 28, then the sections 11 and 11ª are re-

moved before the tie rods 28 are taken off, then the tie bolts are removed, and then the sections 10 and 10ª are removed. The joist pocket form now remains still in place against the wall with its projections 35 extending into the wall. The form sections are now taken over to the opposite side of the foundation, that is where the other end of these same joists will be, set the builder up at that corner, but before placing the wedges 26 in position, remove the joist pocket form, bring it over to where the builder is now set up but do not turn it around with the other end toward the corner but turn it upside down so that what was formerly the bottom edge now becomes the top edge and, of course, under these circumstances there will be a portion extending downward over the outside face of the wall, as shown in Figure 5. Where the joist pocket forms are not intended to be used, then a plate of the same thickness is to be used under the angle iron 20 on the bulkhead, this plate being equal in thickness to the two sheets 34 and 34ª. This plate will be about two inches wide and as long as the builder is high and with holes bored so that the screws 19 may pass through these holes. Such a plate must always be used when the joist pocket form is not in use, for otherwise there would be no room for the sheets to be placed between builder and wall.

As before remarked, the joist pocket form 35ª, which is removable, is not separated from the next adjacent joist pocket form by as great a distance as the other joist pocket forms. This is necessary because of the way in which lumber and lath are cut when they come from the mill, but where two joist pocket molds 34 are laid end to end, the regular spacing is carried onto the other sheet. Thus the spacing is the same everywhere, except the one place at the end, and when this device is to be used any where except on a corner, the odd space makes it necessary to remove the end pocket form 35ª. The joists are spaced regularly from one end of the building to the other.

Coacting with the core sections 12 and 13 when a window or door opening is to be formed are the metallic plates 36 (see Figure 14) which are made of galvanized iron and are adapted to be telescoped over the core sections 12 and 13. Used in connection with these plates 36 is a tapering core 37 (see Figure 13 and Figure 14) which is used to form the recess for the sash weights. This core 37 has projecting lugs 38 which can project, as shown in Figure 14, into the space between the plates 36. The core is formed with a hand hold 39 and with upwardly projecting lugs 39ª for temporary nails whereby the core may be held to the jack *a* and the temporary wood strips *b* shown in Figure 14.

In the use of the mechanism, the sections 10 and 11 and 10ª and 11ª are used for forming the foundation, except that no tubular tie bars are disposed through the foundation of concrete and no center core is used, tin tubes being used in place of the members 31. Considering that the foundation is already in, then to set up the builder on a corner, take the sections 10 and 11, put the handled bolts 28 through the holes therefor, through the hollow wall tie and through the holes in the section 11. The handled nuts are then placed in position upon these screws. The joist recess molding plates 34 are then put in place and the bulkheads 33 put in place. The core sections 12 and 13 are then inserted downward between the sections 10 and 11 and 10ª and 11ª. These core sections will stand up slightly above the lower sections for the first course only, inasmuch as these core sections will rest upon the foundation.

It will be understood that after the foundation is built, the sections 10 and 11 will be so disposed over the foundation that the ties 31 will rest upon the foundation, as shown in Figure 5. The angle irons 20 will be used at the corners and for holding the bulkheads in place, as previously stated, or if a straight section wall is to be built, the flat irons 20ª will be used to join the sections. The sections are to be leveled up true and if one end is low, the handled nuts are loosened at that end and the builder is raised up level and the nuts tightened again. After the builder is set up, a little concrete is placed in the outside space between the core section 13 and the wall 11 but this is for the first course only. The wedges 26 are then put in place in the grooves 14. After the first course the wedges are put in place before the concrete is poured. The cross bars 23 hold the builder from spreading at the top and also hold the wedges in place.

After the builder is rammed full of concrete, using a mix such as used for making concrete blocks, which mix when used with a small amount of water will set quickly, the builder can be taken apart. After a corner is made and if it is desired to build a straight wall, the section 11 will pair with the section 11ª and the section 10 with the section 10ª and the core sections will, of course, pair in an obvious manner so as to provide for a longitudinally extending straight core section. Any of these pairs can be swung around and used with the other end forms when needed to come closer to or further from the door and window frames. The second time around the wall, ten and a half-inch wall ties are used instead of nine-inch wall ties, and when the wall is nearly high enough to set the window frames the most suitable pair of mold sections as, for instance, 11 and 11ª and 13 and 13ª are used and a bulkhead, such as the bulkhead 33, is put in both ends set so that the inside of the bulkhead at one end is even with the point where the side of the window is to be. Then a temporary bulkhead of 1x4

wood is placed even with the other side of the window and braced back to the regular bulkhead, then the builder can be filled to the desired height and shaped with the proper curve or droop on the outside.

After repeating this until the foundation for all the frames at the same height are ready, then the frame can be set. The window frames and door frames can be made of regular stock size stuff and are centered in the wall, for in the building, the construction of which I am describing, I contemplate that there will be no casing for the window but just a small cove mold on the outside and inside and on the inside the usual stool, apron and corner piece.

In order to form pockets for weights, I provide the metallic core 37 which has been previously described, and the iron plates 36 may form extensions of the core sections 11 and 13. There are to be two pairs of these sheet iron sections 36, one pair eighteen inches long and the other pair eight inches long. Thus in working toward a frame, the core can be turned with the most suitable end toward the frame and this end can be placed so that it is not more than seventeen inches away from the lugs on the pocket core 37, and then a pair of eighteen-inch plates will extend from the ends of the core sections 12 and 13 to the lugs 38. If the core sections should reach too far and go past the lugs on the weight pocket core 37, the core can be moved back two feet and turned with the other end toward frame and then a pair of the iron plates 36 would reach the remainder of the distance.

After the concrete of the wall has set and the sections 10 and 10^a and 11 and 11^a have been removed, the three-eighths inch holes through which the bolts 28 pass are to be closed with cement but the openings which coincide with the tubular ties 31 used in the second course and which are formed by the bolts 28 for said ties are to be left open on the outside and on the inside the floor base will cover them. By leaving recesses for the joists, rafters or floor beams, the concrete is not caused to be molded around the joists, which would be bad practice as they would have a tendency to swell up and burst the concrete. When it is seen that a wall tie 31 is coming so close to a window frame that the iron plates 36 cannot be used, then that particular tie is omitted and just a double wire put through and twisted tight. In cases where the window frames are so close together that even the shortest core section cannot be used, then the iron plates 36 only can be used.

The wood plate on top of this wall should be of 2 x 4, one placed on each side of the air space so that warm air in the air space can rise and pass out through a ventilator in the gable or roof. It will be seen that the provision of this air space in the middle of the wall permits a constant circulation of air through the openings formed by the bolts 28 and through the tubular ties 31 and into the air space, these ties being formed with openings 28^a communicating with the interior of the air space. Thus the wall will be warm and dry in winter and dry and cool in summer, the outside of the wall protecting the inside section of the wall from heat. The circulation of air through this air space would, of course, be stopped by proper operation of ventilating shutters, etc.

This builder can be taken apart without jarring the concrete, for there are no pins to stick and have to be pounded loose and no levers to lift, which would tend to put a strain on the fresh concrete. It will not be necessary to take all of the burs or nuts off at all times but just loosen them on the inside of this wall. The bolts are to be kept greased and the wedges paraffined. In forming a second course, the builder should be set up at the same corner where it was originally set up for the first corner, for there the concrete will be the hardest.

In order that the details of this device may be understood so that it may be properly made and operated, it is pointed out that the weight pocket form shown in Figure 13 is slightly tapered from top to bottom so that it can be easily pulled upward after the concrete is rammed. The temporary nails shown in Figure 14 are to keep the weight form from moving when the concrete is rammed. The nails are, of course, withdrawn after the ramming is done. The wedge 26 should only be tapered to that part which goes down between the core sections. The upper portion of the wedge is not tapered. The iron brace, designated 20^b in Figure 2, goes on over the tie bolts 28 at the ends of the sections when the builder is set up in alignment and is to keep the builder from spreading at the joint. The pockets on joist pocket form extend inward clear to the face of the core but this does not make any opening into the medially disposed core chamber when floor, ceilings and baseboards are in place. The core sections can be braced so as to guard against warping.

This builder will work best when it is used from a starting point clear around the building. It will then bring the building to the right dimensions exactly. It is to be understood that the sections 10 and 10^a and 11 and 11^a can be used in pairs or separately and, when wanted, the parts can be connected up to make a long form. All of the parts of the form are reversible, including the outside corner angle irons 20 which sometimes have to be used with their other ends up on account of the way the builder sections are lapped at the corner. The ties 31 are made of standard iron or steel pipe and are cheap and easy to construct.

It will be noticed that the spacing of the

ties and joist pockets is such that when any section of the builder is moved to any place on the wall, it will exactly fit. Thus, for instance, if the joist pocket form was used along the wall until it came to a place where joists did not go into the wall on account of a stair opening, for instance, then in that particular place the joist pocket form would be left out, but when the wall form was placed at the other side of the stair opening the joist pocket form would be put in place and used and it would be impossible for it to be placed wrong and the regular spacing of the joist is continued wherever necessary with the joists spaced a standard spacing apart. Where the joist pocket formers 34 are not used, then metallic plates of the same thickness are to be disposed between the outside faces of the sections 11 and 11^a (or whatever sections are joined to each other) and the angle irons 20 or flat irons 20^a so as to compensate for leaving out the sheet metal plates 34 and 34^a and yet make the wall of the same thickness throughout.

It will be seen that this wall builder is very simple in construction, can be easily put together and readily removed without disturbing the concrete, and has been found thoroughly effective in practice.

I claim:—

1. A wall builder for concrete structures comprising oppositely disposed mold sections, bolts detachably connecting said sections, intermediate core sections adapted to be disposed between the first named sections, means for holding said core sections separated from each other to a desired degree to thereby form an air space within the wall, and tubular metallic ties adapted to be disposed around said bolts and within the concrete wall so formed, the core sections being vertically slotted to extend over said ties and certain of the ties having openings communicating with the space between the core sections.

2. A wall builder for concrete structures comprising oppositely disposed sections, bulkheads adapted to be disposed at the ends of the sections and removably engaged therewith, intermediate core sections disposed between the first named sections and having vertically extending confronting wedge channels open upon their inner faces, wedges adapted to be disposed through said wedge channels to thereby hold the core sections apart to form an air space, the lower margins of the core sections being vertically slotted and the outer sections being formed with bolt holes, bolts adapted to extend through said holes and through the slots in the core sections, tubular metallic ties through which the bolts pass, the ties being accommodated within the slots of the core sections, and means at the ends of the first named sections whereby they may be joined to other sections or to a bulkhead.

3. A wall builder for concrete structures including oppositely disposed, parallel, outer mold sections, each of said mold sections adjacent its lower end having transverse bolt holes, the upper margins of the mold sections carrying upwardly extending members vertically slotted at their upper ends, intermediate core sections vertically slotted at their lower ends in correspondence with the bolt openings in the outer sections, the inner confronting faces of the core sections having vertical confronting grooves, locking members adapted to engage with the upwardly extending members of the outer sections and hold the latter from outward movement, said locking members having outwardly projecting lugs and being disposed with the lugs in aligned relation to the vertical grooves in the core sections, wedges adapted to be disposed downward through said lugs and into the grooves of the core sections whereby to hold the core sections apart, bolts adapted to be disposed through the bolt holes in the outer sections and the slots in the core sections and having nuts bearing against the outer faces of the outer sections, and tubular wall ties surrounding said bolts and accommodated by the slots in the core sections, said ties having openings extending through the ties in correspondence with the space between the core sections.

4. A wall builder for concrete structures including oppositely disposed, parallel, outer mold sections, each of said mold sections adjacent its lower end having transverse bolt holes the upper margins of the mold sections carrying upwardly extending members vertically slotted at their upper ends, intermediate core sections vertically slotted at their lower ends in correspondence with the bolt openings in the outer sections, the inner confronting faces of the core sections having vertical confronting grooves, locking members adapted to be engaged with the upwardly extending members of the outer sections and hold the latter from outward movement, said locking members having outwardly projecting lugs and being disposed with the lugs in aligned relation to the vertical grooves in the core sections, wedges adapted to be disposed downwardly through said lugs and into the grooves of the core sections whereby to hold the core sections apart, bolts adapted to be disposed through the bolt holes in the outer sections and the slots in the core sections and having nuts bearing against the outer faces of the outer sections, tubular wall ties surrounding said bolts and accommodated by the slots in the core sections, certain of said ties having openings extending through the ties in correspondence with the space between the core sections, the ends of the outer sec-

tions being provided with outstanding bolts, and irons having bayonet slots adapted to be engaged with said bolts to thereby hold one set of outer sections in conjunction with the other set of core sections.

5. A wall builder for concrete structures including oppositely disposed outer sections, means for engaging the lower margins of the sections with each other and holding them in spaced relation, means for engaging the upper margins of the sections with each other and holding them in spaced relation, and members adapted to be disposed against the inner faces of the first named sections and having inwardly extending pocket forms mounted thereon whereby pockets may be made for joists.

6. A wall form for concrete buildings including a plurality of inner sections and a plurality of outer sections, the outer sections being longer than the inner sections whereby said sections may be disposed in alignment with each other or at right angles to each other to form a corner, two pairs of core sections adapted to be disposed between the first named sections and to be disposed either in alignment with each other or at right angles to each other, the core sections of each pair confronting each other and having vertical grooves upon their inner faces, means for locking the first named sections in spaced relation to each other both at top and bottom, means for holding the confronting core sections in spaced relation to each other, bulkheads adapted to be disposed at the ends of the first named and core sections, means for detachably engaging the bulkheads with the outer sections, and thin metallic sections having the same height as the core sections and adapted to be disposed against the outer faces of the same and extended longitudinally to any desired extent.

7. A wall form for concrete buildings including a plurality of inner sections and a plurality of outer sections, the outer sections being longer than the inner sections whereby said sections may be disposed in alignment with each other or at right angles to each other to form a corner, two pairs of core sections adapted to be disposed between the first named sections and to be disposed either in alignment with each other or at right angles to each other and having vertical grooves upon their inner faces, means for locking the first named sections in spaced relation to each other both at top and bottom, means for holding the confronting core sections in spaced relation to each other, bulkheads adapted to be disposed at the ends of the first named and core sections, means for detachably engaging the bulkheads with the outer sections, thin metallic sections having the same height as the core sections and adapted to be disposed against the outer faces of the same and extended longitudinally to any desired extent, and means for molding a weight recess for windows including a metallic box having the size of the weight recess to be molded and having lugs projecting therefrom and adapted to be engaged within the said metallic sections.

8. A wall builder for concrete structures including oppositely disposed outer sections, means for engaging the lower margins of the sections with each other and holding them in spaced relation, means for engaging the upper margins of the sections with each other and holding them in spaced relation, and sheet metal members adapted to be disposed against the inner faces of the first named sections, each having a plurality of inwardly extending pocket forms mounted thereon whereby pockets may be made for joists, each member having a removable form at its extremity.

9. A wall builder for concrete structures including oppositely disposed outer sections, means for engaging the lower margins of the sections with each other and holding them in spaced relation, means for engaging the upper margins of the sections with each other and holding them in spaced relation, and sheet metal members adapted to be disposed against the inner faces of the first named sections, each having a plurality of inwardly extending pocket forms mounted thereon whereby pockets may be made for joists, each member being formed of two sheets of sheet metal, the inner sheet being formed with the inwardly extending pockets, the outer sheet extending above and below said pockets, the sheet having a removable pocket at one end, the remainder of the pockets being evenly spaced from each other.

10. A wall builder for concrete structures comprising oppositely disposed mold sections, means detachably connecting said sections, intermediate core sections adapted to be disposed between the first named sections, means for holding said core sections separated from each other to a distance sufficient to form an air space within the wall, and tubular metallic ties adapted to be disposed within the concrete wall so formed and open upon the outer faces thereof, the core sections being vertically slotted to extend over said ties and certain of the ties having openings communicating with the space between the core sections.

In testimony whereof I hereunto affix my signature.

JOHN W. MILES.