June 26, 1928. 1,674,908

C. P. MADSEN

INTERLOCKING SECTIONAL SHEET METAL CONSTRUCTION

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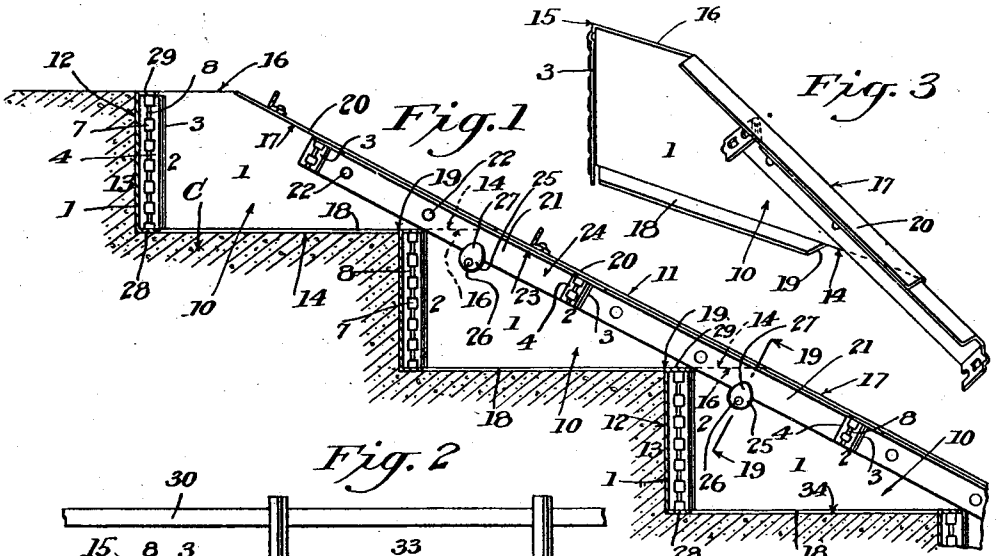


Fig. 1

Fig. 3

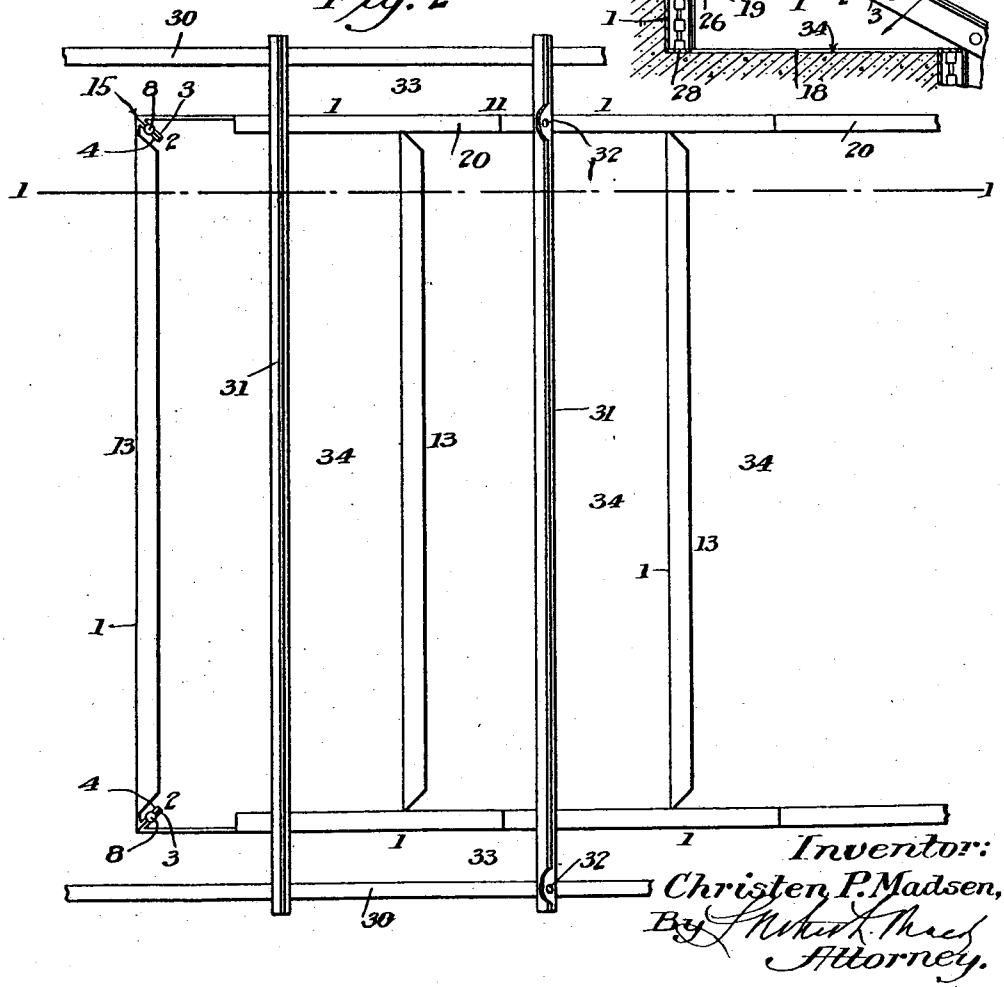


Fig. 2

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Fig. 4

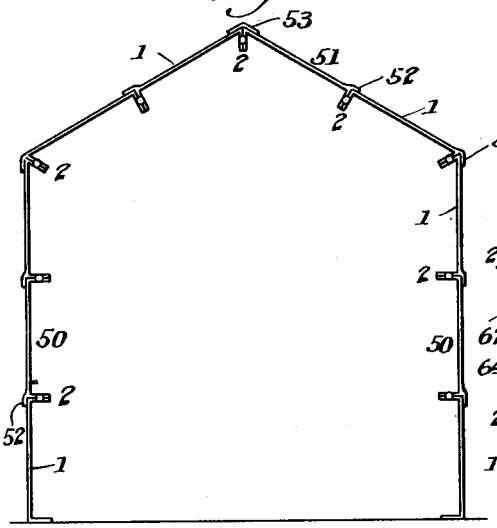


Fig. 5

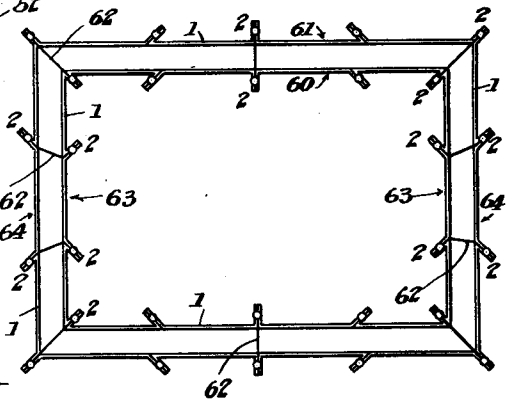


Fig. 6

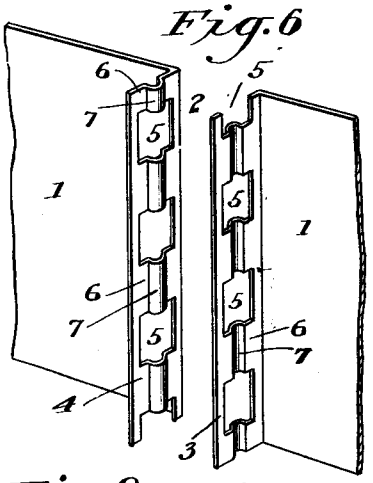


Fig. 7

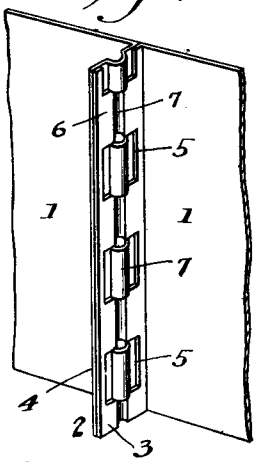


Fig. 8

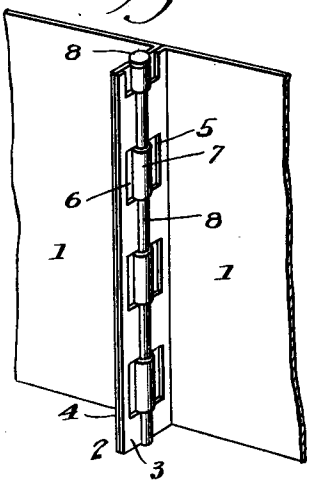


Fig. 9

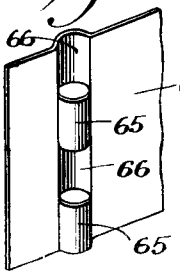


Fig. 10

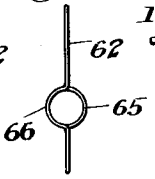
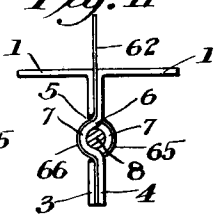


Fig. 11



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INTERLOCKING SECTIONAL SHEET METAL CONSTRUCTION

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Fig. 12

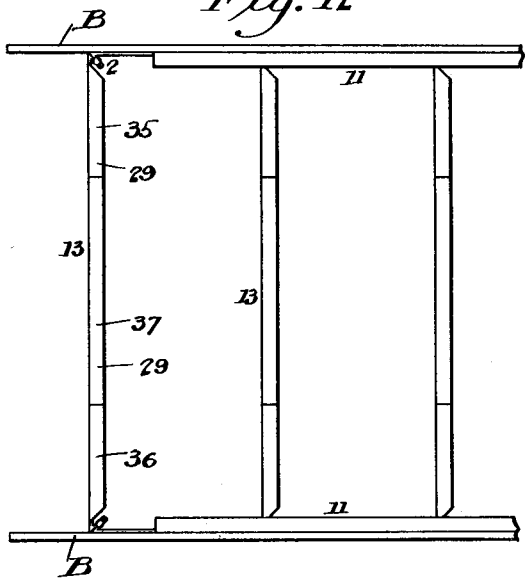


Fig. 13

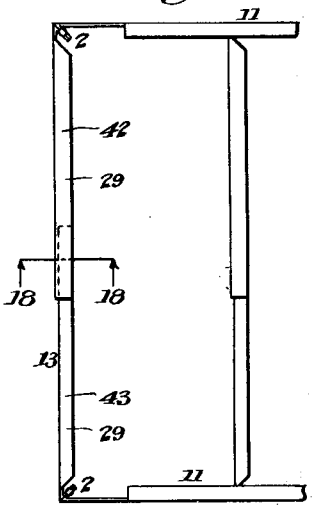


Fig. 14

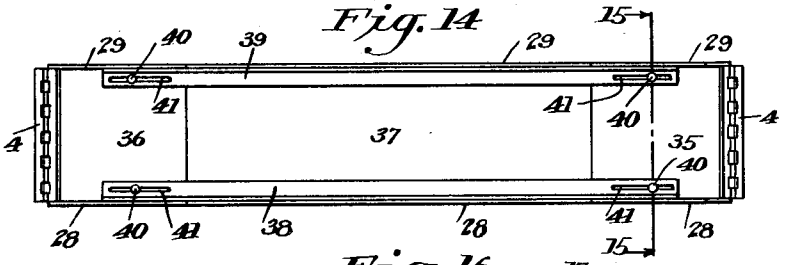


Fig. 15

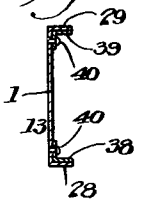


Fig. 16

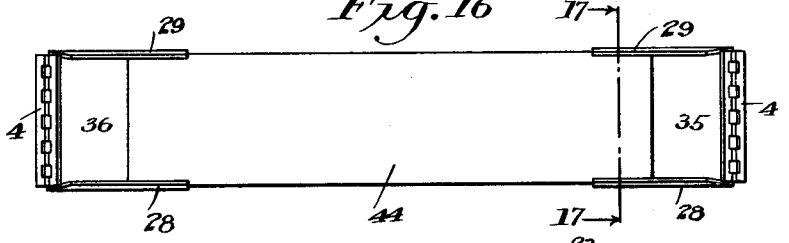


Fig. 17.

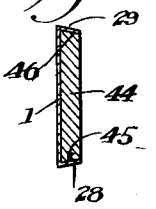


Fig. 19

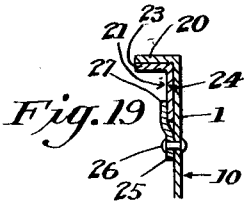
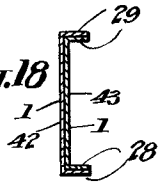


Fig. 18



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UNITED STATES PATENT OFFICE.

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INTERLOCKING SECTIONAL SHEET-METAL CONSTRUCTION.

Application filed October 27, 1925. Serial No. 65,171.

The invention relates to sectional sheet metal construction and the general object thereof is to provide a sheet metal construction comprising a plurality of interlocking, detachable sections which may be used for cement molds, boxes, buildings and other purposes.

A more particular object is to provide an improved interlocking, detachable joint between the sections of sectional sheet metal construction.

Other objects will appear as the description progresses.

The invention is illustrated in the annexed drawing forming a part of this specification, in which:

Fig. 1 is a longitudinal vertical section of a cement mold embodying my invention, taken on line 1—1 of Fig. 2.

Fig. 2 is a plan view of the step mold shown in Fig. 1.

Fig. 3 is a perspective view of one of the sections of the buttress members of the step mold shown in Figs. 1 and 2.

Fig. 4 is a transverse vertical section of a building made of my sheet metal construction.

Fig. 5 is a horizontal sectional view of a building or box wall mold embodying my invention.

Fig. 6 is a perspective view of one of the interlocking joints of my construction, the members of the joint being unlocked and separated.

Fig. 7 is a perspective view of the joint shown in Fig. 6, but showing the members of the joint assembled in position to receive the locking pin.

Fig. 8 is a perspective view of said joint with the pin inserted therein and the joint members interlocked by said pin.

Fig. 9 is a fragmentary perspective view of one of the mold spacers shown in Fig. 5.

Fig. 10 is a fragmentary plan view of the spacer shown in Fig. 9.

Fig. 11 is a plan view of one of the interlocking section joints with one of the mold spacers interlocked therein.

Fig. 12 is a plan view of another form of step mold embodying my invention for molding steps of different lengths.

Fig. 13 is a plan view of another form of step mold embodying my invention for molding steps of different lengths.

Fig. 14 is an outside elevation of one of the extensible and contractable riser members of the mold shown in Fig. 12.

Fig. 15 is a cross section of the riser member shown in Fig. 14 taken on line 15—15 of Fig. 14.

Fig. 16 is an outside elevation of another form of extensible and contractable riser member for the step mold.

Fig. 17 is a cross section of the riser member shown in Fig. 16 taken on line 17—17 of Fig. 16.

Fig. 18 is a cross section of the riser member shown in Fig. 13 taken on line 18—18 of Fig. 13.

Fig. 19 is a fragmentary cross section of one of the sections taken on line 19—19 of Fig. 1, showing the engagement of a button on one section with the tie bar of another section.

My construction comprises generally a plurality of sheet metal sections 1 detachably connected together by interlocking joints 2. Each joint comprises a pair of flanges 3 and 4 formed respectively on the abutting ends of adjoining sections 1 and formed with slots 5 and bead members 6 between said slots, in which members are stamped beads 7, the slots 5 of each flange 3 or 4 being arranged to receive the beads 7 of the other flange, and the beads of one flange being impressed in the opposite direction to the beads of the other flange so that said beads will register to receive a pin 8, whereby the flanges and the sections of which they are a part are detachably interlocked together.

In the form of my invention shown in Figs. 1, 2 and 3 the sections 1 and their joints 2 are constructed and arranged in the form of a mold for molding cement steps. In this form of my invention certain of the sections 1, indicated 10, are constructed to interlock in the form of step buttress mold members 11, while other sections 1, indicated 12, are constructed to interlock with the sections 10 in the form of step riser mold members 13. Each buttress section 10 is formed with a lower horizontal edge 14 extending the full length thereof, a rear vertical edge 15 extending the full height thereof, an upper horizontal edge 16 extending forwardly from said rear vertical edge a portion of the length of the section, and an

upper inclined edge 17, inclining downwardly from the forward end of said upper horizontal edge 16 to the lower horizontal edge 14 at the forward end of the section, which inclined edge corresponds to the upper inclined face of the cement buttress to be molded. The section is formed with a vertical joint flange 3 extending inwardly from the rear edge 15 at 45 degrees to the section. The section is formed with an inturned horizontal flange 18 along its lower edge 14, which flange extends from the rear vertical edge of the section to a point 19 a short ditsance rearwardly of the forward end of the section. An inturned flange 20 is formed along the upper inclined edge 17 of the section.

An angle bar 21 is secured to the inside of the section by rivets 22, with the upper flange 23 of said bar adjacent the under side of flange 20, the side flange 24 of the bar against the inside of the section, the upper end of the bar at a point about midway between the rear and forward ends of the section, and the lower end of the bar extending a portion of its length beyond and below the forward end of the section, the rivets 22 extending through the side flange 24 of the bar and through the vertical wall of the section. On the upper end of the bar 21 is formed a joint flange 3 and on the lower end of the bar 21 is formed a joint flange 4, which flanges extend inwardly at 45 degrees from the bar flange 24 and parallel to each other. On the inside of each section 10, in the upper rear portion thereof, is pivotally mounted a button 25 on a pivot 26, the button being formed with an offset member 27 for engaging the flange 24 of the bar 21 of the next section 10 above to securely hold said upper rear portion of the former section against said bar flange and in alinement with the latter section. Each riser section 12 is formed with external flanges 28 and 29 along their lower and upper edges respectively and with joint flanges 4 at their end edges, which joint flanges extend outwardly at 45 degrees to the section.

In assembling the step mold, the sections 10 are placed with the forward portions of their lower edges 14 upon the upper edges 16 of the next sections below, with the forward ends 19 of the lower flanges 18 of the sections against the rear edges 15 of said next lower sections, and with the flanges 20 of the sections in alinement with each other and the joint flanges 4 of the bars 21 of the sections in engagement with the joint flanges 3 of the bars of the next lower sections, the inclination of the flanges permitting the joint sections to be readily assembled or taken apart. The buttons 25 are then turned so that their offsets 27 engage the flanges 24 of the bars 21. Pins S are then inserted through the beads 7 of said joint flanges 3 and 4 of the bars 21 and the joints 2 of said bars interlocked whereby the buttress sections are assembled and detachably interlocked together. The riser members 13 of the mold are then placed in position with their end joint flanges 4 in engagement with the rear end joint flanges 3 of the sections 10 of the buttress members 11 respectively. The pins S are then introduced through the beads 7 of said flanges 3 and 4 interlocking the joints 2 between the buttress members 11 and the riser members 13, whereby the riser members are detachably interlocked with the buttress members. Outer buttress members 30 are then laid outside the buttress members 11 at a distance corresponding to the thickness of the buttress to be molded. Angle bars 31 are then laid transversely of the mold upon the upper flanges 20 of the inner buttress members 11 and upon the upper edges of the outer buttress members 30 and said angle bars are secured to said flanges and edges by screws 32, whereby the buttress members are held in proper relation for molding. The cement C may then be poured in the spaces 33 between the buttress members 11 and 30 to mold the buttresses, and in the spaces 34 between the buttress members 11 and between the riser members 13 to mold the steps.

When it is desired to mold steps without buttresses, the buttress members 30 are not used, but boards B may be placed at the ends of the steps against the outside of the inner buttress members 11 and said members nailed or otherwise secured to said boards.

When the mold is used for steps of uniform length, riser members 13, each comprising a single section of fixed length, are used as shown in Fig. 2.

When the mold is used for steps of different lengths the extensible and contractable riser members 13 shown in Figs. 12 to 18 inclusive may be used.

In Figs. 12, 14 and 15 the riser member 13 is made in three sections 35, 36 and 37 secured together by angle bars 38 and 39. The sections 35 and 36 are secured at their outer ends by joints 2 to the rear ends of a pair of oppositely disposed sections 10 of the buttress members 11 respectively. The said three sections are formed with upper and lower flanges 28 and 29 and their cross sections are the same, so that the sections may be placed end to end with the section 37 between the sections 35 and 36 to form a continuous uniform riser member. The angle bar 38 is placed in the lower corner of the sections 35, 36 and 37 against the outside of said sections and upon their flanges 28, while the angle bar 39 is placed in the upper corner of said sections against the outside thereof and against the under

side of the flanges 29 of said sections. The angle bars 38 and 39 may be detachably secured to the sections 35 and 36 by screws 40 extending through longitudinal slots 41 in said bars, or other suitable means for holding the section 37 between the sections 38 and 39. For steps of different lengths, sections 37 of different lengths are used.

In Fig. 13 the riser member is shown made in two sections 42 and 43, the section 43 telescoping within the section 42. The sections 42 and 43 are connected at one end by joints 2 to the rear ends of two oppositely disposed sections 10 of the buttress members 11 respectively.

In Figs. 16 and 17 the sections 35 and 36 are used but the section 37 and angle bars 38 and 39 are not, and instead thereof a board 44 is placed against the outside of the sections 35 and 36 between their flanges 28 and 29. The lower and upper edges 45 and 46 of the board 44 may be beveled so that the lower and upper flanges 28 and 29 of the sections 35 and 36 may be struck with a hammer and bent against said beveled edges to hold the board in said sections. The length of the riser may be varied by telescoping the sections 35 and 36 more or less on the board 44.

When my invention is used for buildings as shown in Fig. 4 the sections 1 are placed one above the other to form the side walls 50 and the roof 51 of the building with the joints 2 between the sections on the inside of the house. On the lower edge of each section beyond the joint flange thereof is formed an external flange 52 which overlaps the joint 2 between the section and the next section below to prevent leakage through the joint. A plate 53 is placed over the peak of the roof and the peak joint 2 between the uppermost roof sections 1 to prevent leakage through the peak joint. The intermediate joints 2 of the walls 50 and roof 51 may extend at right angles to said wall and roof respectively, while the joints between the sections at the peak and at the eaves of the roof may extend at mean angles between the peak angle and the eaves angles of the roof so that the sections at such points may be readily fitted together or taken apart.

When my invention is used for molding the walls of a building or a box as shown in Fig. 5 the sections are interlocked together by their joints 2 to form an inner mold member 60 and an outer mold member 61, which members are held spaced apart the thickness of the wall to be molded, by spacers 62. The joints 2 between the sections of the inner mold member 60 are on the inside of said member, while the joints 2 between the sections of the outer mold member 61 are on the outside of said member. The joints 2 between the intermediate sections, indicated 63, of the inner mold member 60 and the adjacent sections of said member may extend at obtuse angles to said intermediate sections, so that said sections may be readily placed in position in said inner mold member in assembling the mold, or removed from said mold member when the pins 8 are taken out of the joints of said sections. The joints 2 of the intermediate sections indicated 64 and the adjacent sections of the outer mold member 61 may also extend at obtuse angles so that said intermediate sections may be readily placed in position in said mold member or removed therefrom in assembling the mold or taking the same apart. The corner joints 2 of the mold may extend at angles of 45 degrees to the inner and outer mold members 60 and 61. The spacers 62 may consist of thin metal such as tin, so that they may be compressed between the joint flanges 3 and 4 and beads 65 and 66 struck out of the same by the beads 7 of said joint flanges respectively, which beads 65 and 66 extend over the outside of said beads 7 when the joint 2 is interlocked, thus locking the spacer in the joint.

When the wall is molded and the members 60 and 61 removed the projecting ends of the spacers 62 may be cut, by snips, even with the inner and outer surfaces of the wall.

Although I have shown a preferred embodiment of my invention in the accompanying drawings, and described herein, it will be understood that I may change or modify the same within the scope of the appended claims without departing from the spirit thereof.

What I claim is:

1. Sheet metal construction arranged in the form of a mold for cement steps comprising a pair of buttress members, each of said members being formed in sections, a tie bar on each section extending therebelow and over the next section below, interlocking joints for detachably connecting the lower ends of said bars respectively to the next lower sections, riser members, interlocking joints for detachably connecting the ends respectively of each riser member to the rear ends respectively of a pair of oppositely disposed sections of said buttress members.

2. Sheet metal construction arranged in the form of a mold for cement steps comprising a pair of buttress members, each of said members being formed in sections, a tie bar on each section extending therebelow and over the next section below, interlocking joints for detachably connecting the lower ends of said bars respectively to the next lower sections, buttons on said sections for engaging respectively the tie bars of the next upper sections respectively.

3. Sheet metal construction arranged in the form of a mold for cement steps comprising a pair of buttress members, each of

said members being formed in sections, a flange on the lower edge of each section, the forward end of which flange being spaced at a distance rearwardly of the forward end of the section, the lower edge of said section, forwardly of said flange, resting on the rear portion of the upper edge of the section below with the forward end of said flange engaging the rear edge of the section below, means for detachably securing said sections together, riser members, and means for connecting said riser members to said buttress members.

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