Sept. 2, 1958 B. G. SIMMONS 2,849,874

STRUCTURAL BLOCK JOINT

Filed Sept. 26, 1955

Fig. 1.

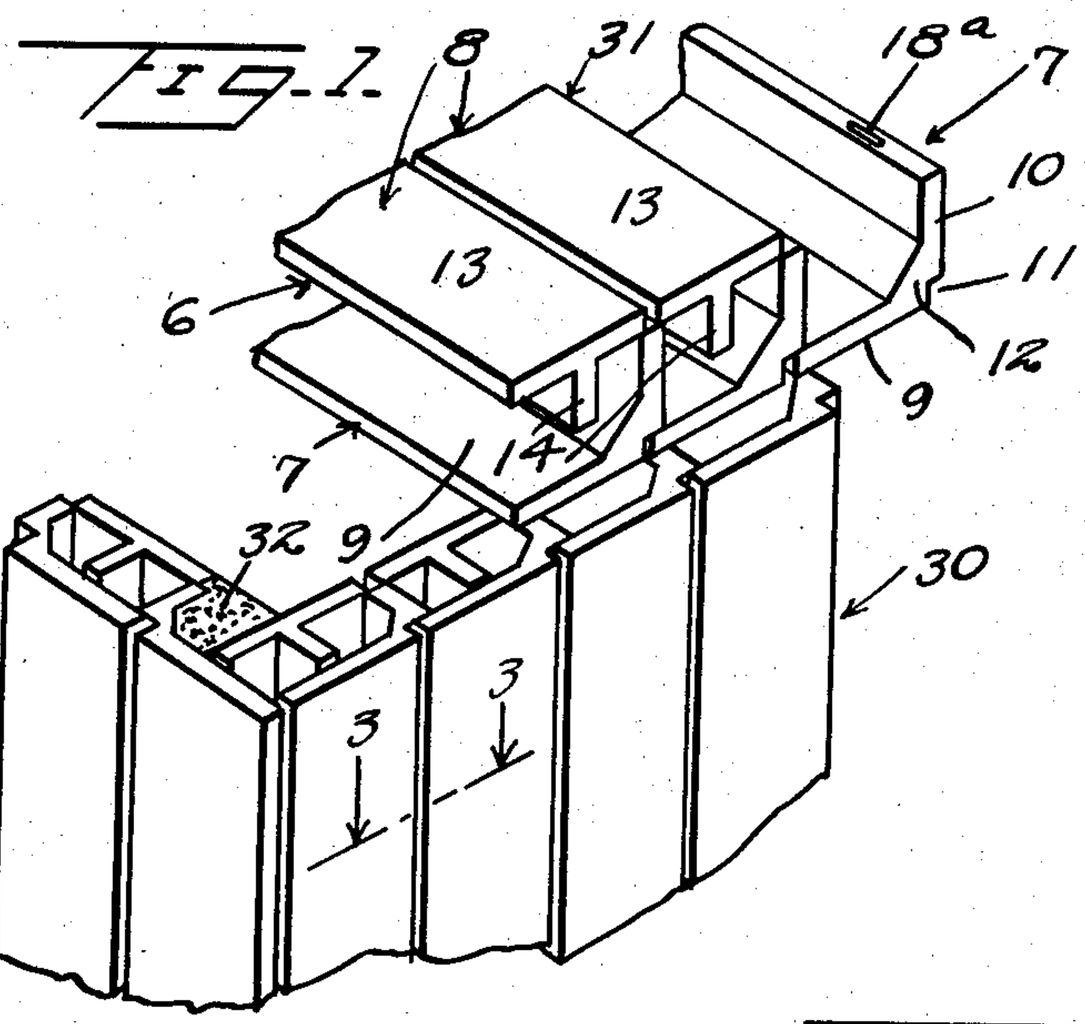


Fig. 2.

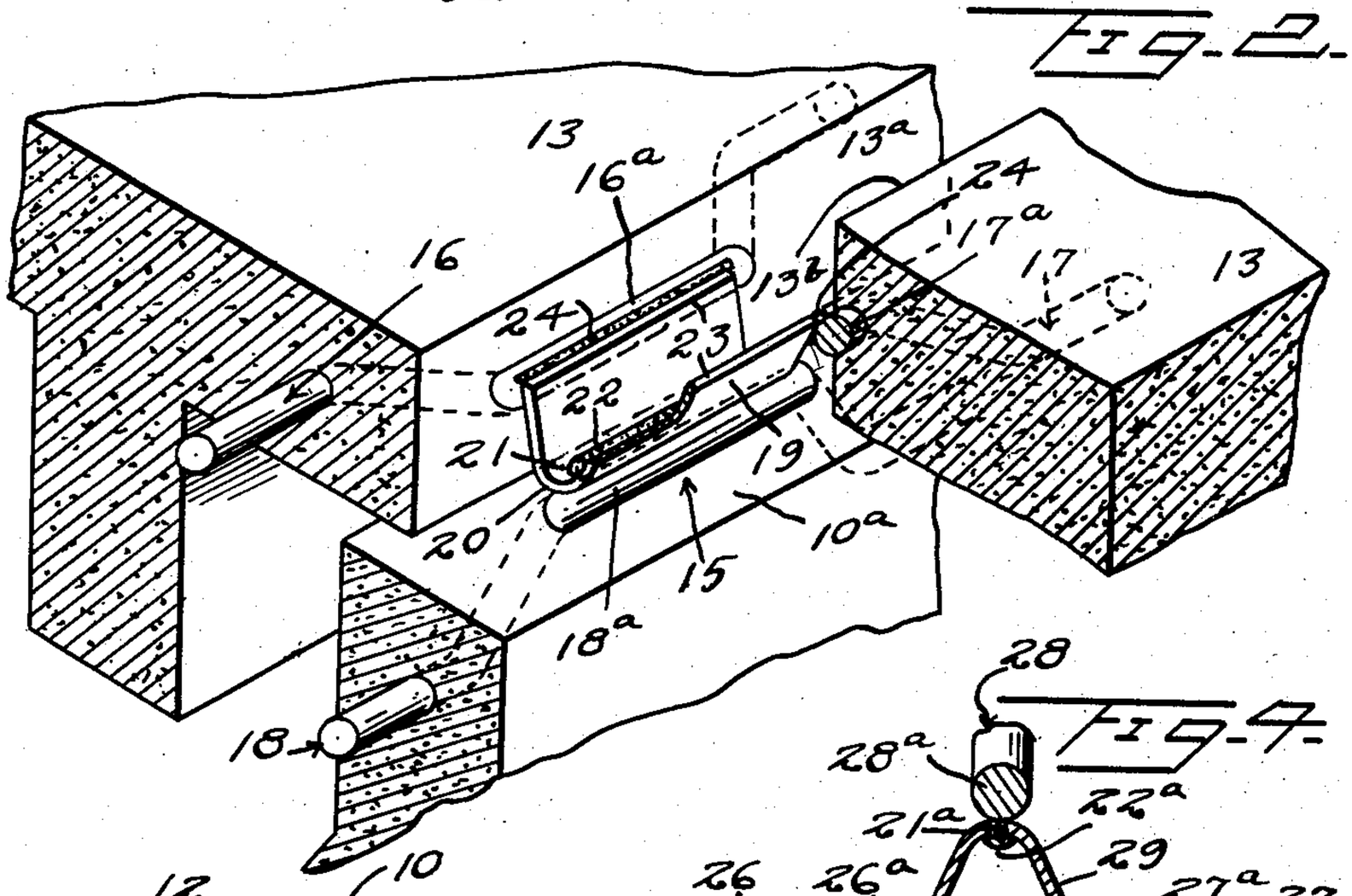


Fig. 4.

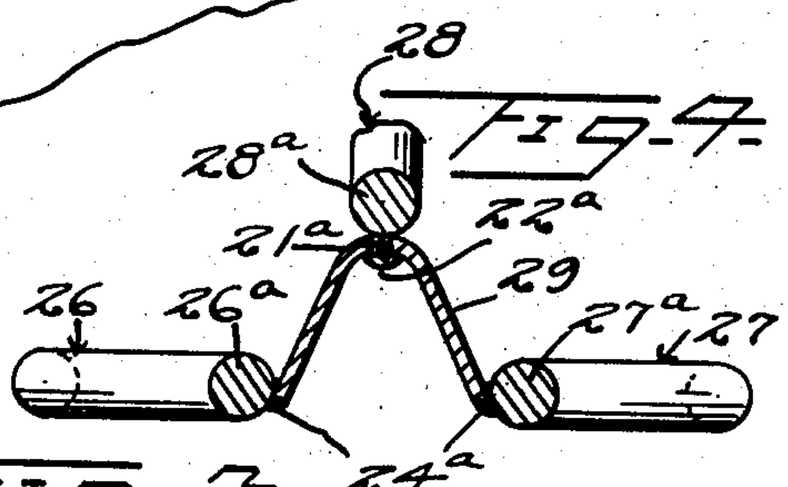
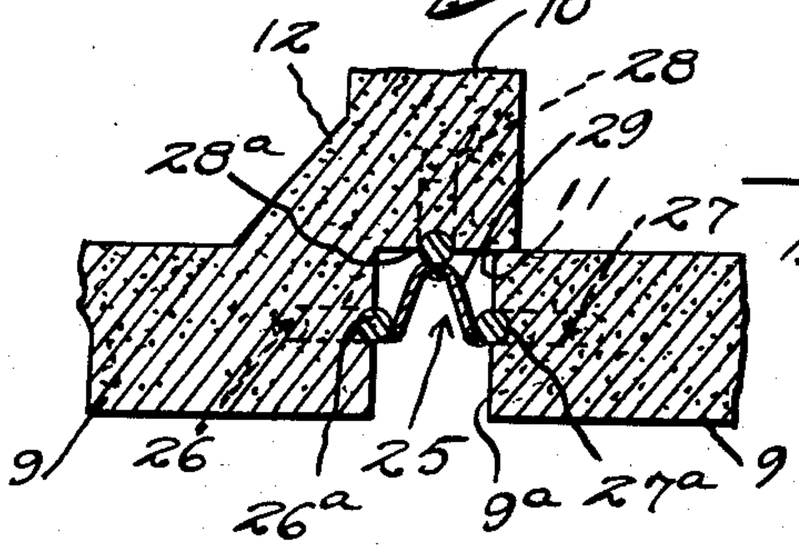


Fig. 3.



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STRUCTURAL BLOCK JOINT

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1 Claim. (Cl. 72—107)

This invention relates to a precast concrete structural unit formed of sections, a plurality of which units are capable of being readily assembled to provide a hollow concrete wall, floor, ceiling or roof.

Another object of the invention is to provide a precast structural unit including novel means for anchoring the individual sections of each unit together and for anchoring or connecting adjacent units to form a wall, floor, ceiling or roof.

A further object of the invention is to provide anchoring or connecting means which are so constructed as to permit relative expansion and contraction of the individual units and sections and to compensate for irregularities in adjacent edges thereof.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawing, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a fragmentary perspective view in elevation showing a plurality of the structural units assembled to form parts of walls and a part of a floor, ceiling or roof;

Figure 2 is an enlarged fragmentary perspective view in section illustrating details of sections of the structural units;

Figure 3 is an enlarged cross sectional view taken substantially along a plane as indicated by the line 3—3 of Figure 1, and

Figure 4 is an enlarged cross sectional view of the connecting means, as shown in Figure 3, removed from the concrete sections.

Referring more specifically to the drawing, the structural unit comprising the invention is designated generally **6** and is composed of a precast concrete section **7** and a precast concrete section **8**.

The concrete section **7** is of angular shape in cross section and is composed of the sides **9** and **10** which form a right angle with one another. The section **7** is provided with a notch **11** of right angular cross section formed in the outer corner of the sides **9** and **10** and which extends from end-to-end of said angular section **7**. The inner side of the corner formed by the sides or walls **9** and **10** is thickened as seen at **12**, opposite to the notch **11**, so that the corner of the section **7** is not weakened by the notch **11**.

The section **8** of each structural unit **6** is of T-shaped cross section and comprises a bar portion **13** and a web **14**. Said web **14** projects perpendicularly from one side of the bar **13** and is spaced midway between the longitudinal edges thereof and extends from end-to-end of said bar.

The sections **7** and **8** are provided with anchoring units, designated generally **15**, and illustrated in Figures 2, 3 and 4. The anchoring or connecting units **15** comprise rods **16**, **17** and **18** and a connecting plate **19**. The rods **16** and **17** are anchored in complementary portions of the bars **13** adjacent longitudinal edges thereof and have intermediate portions **16***a* and **17***a* which are offset relative to the end portions of said rods and which are outwardly

offset relative to the longitudinal edges **13***a* and **13***b* of the bars **13**, so that said intermediate rod portions **16***a* and **17***a* are exposed. Similarly, the rod **18** is anchored in the side **10** and has its offset intermediate portion **18***a* disposed outwardly with respect to the longitudinal edge **10***a*, which is located remote from the notch **11**, and so as to be disposed in an exposed position. It will be understood that the rods **16**, **17** and **18** of each anchoring or connecting unit **15** are disposed corresponding distances from complementary ends of the sections **7** and **8** and that any number of said connecting units may be provided along the lengths of said sections. The plate **19** is of substantially V-shaped cross section and has a rounded intermediate portion **20** provided with a plurality of slots or elongated openings **21**. Said intermediate portion **20** is adapted to rest upon the rod portion **18***a* and is secured thereto by welding as seen at **22** through the slots or openings **21**. The longitudinal edges **23** of the plate **19** bear against the rod portions **16***a* and **17***a*, as seen in Figure 2, and are secured thereto by welding, as seen at **24**. Thus, the sections **7** and **8** of a structural unit **6** are connected together by the parts **16**, **18** and **19** of each connecting unit **15** and the sections **8** of adjacent units **6** are connected by the parts **16** and **17** and the plate **19**. The connecting unit **15** also connects the section **7** of the unit **6** to the section **8** of an adjacent unit **6** by the parts **17**, **18** and **19** thereof, all as clearly illustrated in Figure 2.

Connecting units **25**, corresponding to the units **15**, are provided for connecting the sections **7** of adjacent units **6**. As best illustrated in Figure 3, the rod **26**, corresponding to the rod **16**, is anchored in the wall **9** of a section **7** and has its offset intermediate portion **26***a* exposed in the notch **11** of said section. The rod **28** is embedded and anchored in the lower part of the wall or side **10** and has its intermediate portion **28***a* partially exposed in the notch **11**. A rod **27**, corresponding to the rod **17**, is anchored in the side **9** of an adjacent section **7** and has its intermediate portion **27***a* protruding from the longitudinal edge **9***a*, which is disposed remote from the notch **11** of said last mentioned wall **9**. The plate **29**, corresponding to the plate **19**, is assembled in the same manner with the rod portions **26***a*, **27***a* and **28***a*, as the plate **19** is assembled with the rod portions **16***a*, **17***a* and **18***a*, respectively. However, since the rod **28**, corresponding to the rod **18**, is disposed above relative than below the plane of the rods **26** and **27**, the plate **29** is disposed in an inverted position as illustrated in Figures 3 and 4.

Figure 4 clearly illustrates the slots or openings **21***a* in the intermediate portion of the plate **29** to receive the welds **22***a* by which the intermediate portion of said plate **29** is secured to the rod portion **28***a*. Figure 4 also clearly shows the longitudinal edges of the plate **29** secured by the welds **24***a* to the rod portions **26***a* and **27***a*.

It will thus be readily apparent that the connecting units **15** and **25** will effectively function for connecting the sections **6** and **7** together as previously described to form walls as seen at **30** or a floor, ceiling or roof, as seen at **31** in Figure 1. Either of the sections **7** and **8** may constitute either the upper or the lower parts of the horizontal structural member **31** or the inner or the outer parts of the vertical structural member **30**. It will also be understood that after the sections have been assembled the connecting plates **19** and **29** are applied and are welded to the rod portions to which said plates are anchored.

The sides **10** are of sufficient thickness so that the edges **13***a* and **13***b* of adjacent sections **8** may substantially overlie the sides of the wall **10** so that the bar portions **10** will have adequate support on the upper edge **10***a*. However the edges **13***a* and **13***b* are still spaced a substan-

tial distance apart to provide an open joint so that any irregularities therein will not interfere with assembly of the structural units **6**. Similarly, as illustrated in Figure 3, edge portions **9***a* of the sides **9** extend substantially into the notches **11** so that the sides **9** provide substantial supports for the sides **10** of adjacent sections while still leaving an open joint of considerable width. These open joints of the notches **11** and between the edges **13***a* and **13***b* may be filled with a suitable expansion joint material such as mortar, cement or plaster, not shown. Since the connecting plates **19** and **29** are capable of yielding, the joints in which said members are disposed may be expanded or restricted in response to contraction or expansion of the sections **7** and **8**.

The web **14** of each unit **6** is of a height substantially less than that of the wall **10** so that said web does not contact any part of the section **7** but rather is merely utilized to provide beam strength for the bar portion **13**, and the dimensions of said web may vary depending upon the area spanned and the load to be sustained by the bar portion. Thus, when the units **6** are disposed horizontally, the sides **10** will alone sustain the load borne by said units. The relative widths of the sides **9** and **10** of the sections **7** may likewise be varied.

The gap left in the corner formed by the two vertical walls **30**, as seen in Figure 1, may be filled with a suitable filler material **32**.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit or scope of the invention as hereinafter defined by the appended claim.

I claim as my invention:

In combination with two substantially coplanar wall portions having opposed adjacent edges disposed in spaced apart relation to one another and a third wall portion disposed at substantially a right angle to the plane of said two wall portions and having an edge disposed adjacent the gap between said adjacent edges and combining therewith to form an open joint; a connecting unit comprising rods associated with and having end portions embedded and anchored in said wall portions, said rods having exposed intermediate parts spaced outwardly from said edges of the wall portions and disposed in said open joint and relative to one another to form a triangle with two of said exposed parts positioned in opposed relation to one another, and a plate of substantially V-shaped cross section having sides secured to said opposed intermediate parts and an intermediate portion secured to the other intermediate part for connecting said rods and the wall portions together, said plate being yieldable to accommodate contraction and expansion of the open joint.

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