A. C. GILBERT.

TOY BUILDING CONSTRUCTION.

APPLICATION FILED JAN. 6, 1916.

1,329,706. Patented Feb. 3, 1920.

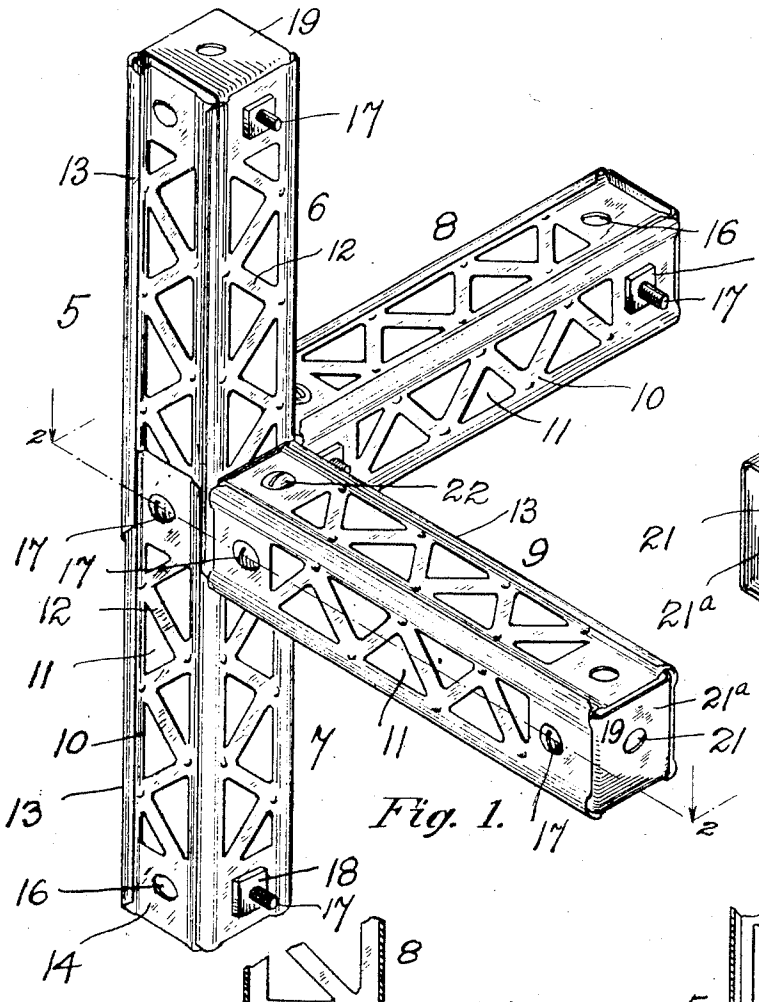


Fig. 1.

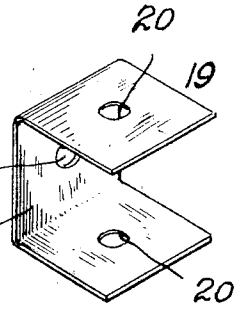


Fig. 4.

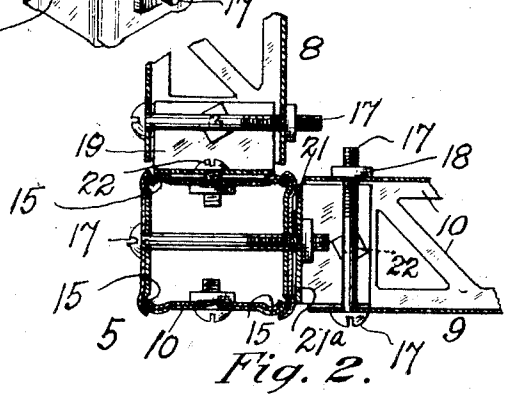


Fig. 2.

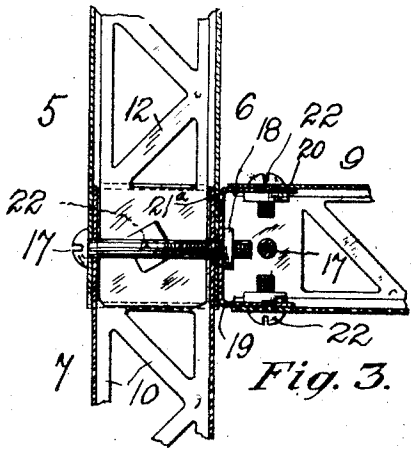


Fig. 3.

WITNESSES:

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TOY BUILDING CONSTRUCTION.

1,329,706. Specification of Letters Patent. Patented Feb. 3, 1920.

Application filed January 6, 1916. Serial No. 70,695.

To all whom it may concern:

Be it known that I, ALFRED C. GILBERT, a citizen of the United States, residing in the city and county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Toy Building Construction, of which the following is a full, clear, and exact description.

This invention relates to toy building construction intended to simulate the modern structural steel used in erecting fireproof buildings, bridges and for similar purposes. The invention relates more particularly to a joint for connecting a box girder section with another box girder section, located at right angles thereto, the construction being of particular advantage in connecting the horizontal girders of a tower or like structure to vertical girders or columns.

The primary object of the invention is to provide a very simple form of joint which, while particularly advantageous in a toy construction, nevertheless possesses considerable strength, and is otherwise well adapted to the intended purpose. Another object of the invention is to provide a construction in which the various parts may be conveniently and readily assembled and taken apart, and in which the number of fastening members is reduced to a minimum.

To these and other ends, the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawing,

Figure 1 is a perspective view of a portion of a tower or framework embodying my improvements, showing two horizontal girder sections connected to a vertical girder or column;

Fig. 2 is a fragmentary section on line 2—2 of Fig. 1;

Fig. 3 is a vertical section through the joint; and

Fig. 4 is a detail perspective view of one of the connecting clips.

Referring to the particular embodiment selected for illustration, a vertical column or box girder 5 is composed of two sections 6 and 7 respectively, connected end to end, and horizontal girder sections 8 and 9 are connected with the column or girder 5 at the junction of the sections 6, 7.

It may be assumed that the column or girder 5 is located at one corner of a tower of which the sections 8, 9 are horizontal connecting members, but, of course, this is not a material feature. Preferably, the girder sections are each made up from sheet metal strips of the kind described in my application Serial No. 814,533, filed January 26, 1914, and each section is formed of four strips arranged in boxlike form, as described in said application, while the sections 6, 7 are preferably connected end to end in the manner described in my application Serial No. 24,974, filed April 30, 1915.

Each sheet metal strip 10 is preferably stamped out at 11 to present truss members 12 integrally connecting the side edge portions of the strip, which are provided with flanges 13. The median portion of the strip, including the truss members 12 and the solid end portions 14, is bent inward out of the plane of the side edge portions so as to present in connection with the flanges 13 parallel grooves or channels 15 extending along the side margins of the strip. The portions 14 at the ends of each strip are provided with perforations 16.

When each of the box girder sections 6, 7, 8, 9 is to be built up, four of the strips 10 are assembled in boxlike form, two of the strips being placed opposite to each other, with the channels 15 of one strip facing those of the other strip. Between the two oppositely located strips just mentioned, two other strips are set in to complete the boxlike structure, the flanges 13 of said last-named strips being engaged in the channels 15 of the first-named strips. The first-named strips are then interconnected at the ends by bolts 17 having nuts 18, and these bolts by pressing the outer strips against the inner spacing strips detachably hold the parts in assembled relation.

The connection between the sections 6, 7 of the upright column 5 is effected by overlapping each strip of section 6 on the corresponding strip of section 7. Although the method of assemblage may be greatly varied, it will be assumed for purposes of description that the upper section 6 is complete except for its lower bolt 17, and that the lower section 7 is complete except for its upper bolt 17. The sections are then nested together at their contiguous ends by the overlapping of corresponding strips, after which a single bolt 17 may be passed through certain of the registering perforations 16 for

the purpose of holding all of the several parts in assembled relation. In the particular form shown in the drawing, the lower ends of the outer strips of the upper section 6 are outside of the upper ends of the outer strips of the lower section, and the connecting bolt 17 in being set in place is first passed through an opening 16 in an outer upper strip and then through a registering opening in an outer strip of the lower section, then, at the opposite side of the box structure, through registering perforations in the corresponding strips at that side, as shown in Fig. 2. It will be understood, therefore, that the bolt 17 just mentioned not only holds the several strips of section 6 in assembled relation at the bottom of said section, and holds the several strips of section 7 in assembled relation at the top of said section, but also detachably interconnects the two sections. Further than this, the said bolt 17 not only has the several functions above mentioned but it also serves in securing the horizontal section 9 to the column 5. For this purpose the end of section 9 which is contiguous to the column has a U-shaped clip 19 set therein. As shown in Fig. 4, the clip 19 is formed of a metal plate having registering perforations 20 in the leg portions, and a perforation 21 in the intermediate portion. The leg portions 20 are secured to opposite strips of the section 9. In the particular instance illustrated, bolts 17 interconnect the outer strips of the girder section 9, as previously explained, and the legs of clip 20 are secured to the inner strips by means of short nutted bolts 22. It will be understood, therefore, that the plane of the clip 19, that is to say the plane of the U, is disposed at right angles to the adjacent bolt 17 which traverses the girder section at that end in which the clip is set. The clip 19 is held so that its intermediate portion 21^a having the perforation 21 extends across the end of section 9, and the long bolt 17, which interconnects sections 6 and 7, is passed through the perforation 21, as shown in Fig. 2. The nut 18 appurtenant to said bolt 17, when applied to the bolt, then presses against the portion 21^a of the clip, and holds it firmly against one side wall of the column 5, so that the girder 9 is secured to the column, and the parts are firmly held in place.

As the section 9 is applied to certain outer strips of the column 5, the section 8, which is at right angles to section 9, must obviously be applied to certain inner strips of the column 5. In doing this, a clip 19 similar to that previously described is inserted in the end of section 8 and held therein by bolts 22 passing through the inner strips of said section. The clip 19 is then held with its intermediate perforation 21 in registry with the alined perforations 16 in the overlapping end portions of the inner strips at that side of the column 5, and a short bolt 22 is passed through the perforation 21, and through the registering perforations 16 so as to lock the section 8 firmly to the column.

I have shown clips 19 set in the outer ends of sections 8, 9 so that they can be readily attached to other girders or columns similar to the girder or column 5, but it will be apparent, of course, that the horizontal girders may be lengthened by adding further sections, and that various changes in the details may be made without departing from the scope of the invention as defined in the claims. I do not claim herein the specific form of box girder section, as claimed in my application Serial No. 814,533, nor the manner of interconnecting two sections, as claimed in my application Serial No. 24,974.

What I claim is:—

1. In toy building construction, two box girder sections, each formed of four sheet metal strips, and having one pair of said strips clamped between the other pair of strips, said sections placed end to end with the strips of one section overlapping the corresponding strips of the other section, a single bolt for retaining said strips in place and for interconnecting two opposing strips of one section, and two opposing strips of the other section, a third section at right angles to said first sections and abutting the same at the point where they overlap, and means including said single bolt for securing said third section to the first two sections; substantially as described.

2. In toy building construction, two box girder sections each formed of four sheet metal strips and having one pair of said strips clamped between the other pair of strips, said sections placed end to end with the strips of one section overlapping those of the other section, a single fastening member for interconnecting certain strips of one section and securing said section to the other section, a third section arranged at right angles to the first two, and a member carried by said third section for engaging said single fastening member so that the third section is secured to the other sections thereby; substantially as described.

3. In toy building construction, a hollow box girder or column having two sections, each comprising an outer pair of strips with longitudinal seats facing each other and an inner pair of strips engaging said seats so as to space apart the strips of the outer pair, bolts passing through and interconnecting the outer strips at the remote ends of said sections, said sections being placed endwise relatively to each other with the strips of one section overlapping the strips of the other section, a similar composite box girder section arranged at right angles to said hollow box girder or column and abutting

the same where the sections thereof overlap each other, and a single bolt passing through the outer strips of the first and second sections where said sections overlap and interconnecting said sections and also securing said sections to the third section; substantially as described.

4. In toy building construction, a hollow box girder or column having two sections, each comprising a plurality of separate sheet metal strips, said sections placed end to end with the strips of one section overlapping the corresponding strips of the other section, a similar composite box girder section arranged at right angles to said column, a clip set in and fastened to the end of said third girder section and abutting said column at the point where its sections overlap each other, and means coöperating with said clip for detachably holding the parts in assembled positon; substantially as described.

5. In toy building construction, two box girder sections placed endwise relative to each other, each girder constructed of two pairs of spaced strips, one pair constructed to receive the other pair therebetween and one pair of strips provided with channeled portions for preventing the other pair from being displaced relatively thereto, a single means for retaining said strips in position to form a girder, and a third section at right angles to the first section, said single means serving also for interconnecting the first two sections and for securing them in turn to said third section; substantially as described.

6. In toy building construction, a box girder section constructed of two pairs of spaced strips, one pair constructed to receive the other pair therebetween and one pair provided with means engaging the edges of the other pair of strips to prevent relative displacement therebetween, a second girder section similarly constructed and arranged at right angles to said first section, a clip set in and fastened to the end of said second section, and a single means for retaining the strips of said first section in place to form a girder, said single means coöperating with said clip for detachably holding said sections in engagement with each other; substantially as described.

7. In toy building construction, a box girder section constructed of two pairs of spaced strips, one pair constructed to receive the other pair therebetween and one pair of strips provided with means engaging the edges of the other pair to retain the last mentioned pair in place relatively thereto, a second section at right angles to the first section, and a single means for retaining said strips in position to form a girder, said single means serving also to secure said second section to the first mentioned section; substantially as described.

8. In toy building construction, two box girder sections placed endwise relative to each other in overlapping relation, each girder constructed of two pairs of spaced strips, one pair of which is clamped between the other pair and one pair of strips provided with means engaging the edges of the other pair of strips for preventing relative displacement of said strips, a third box section constructed similarly to said first sections and extending at an angle thereto, and a single bolt for interconnecting all three sections, said bolt serving also to retain said strips in place to form box girder sections, substantially as described.

In witness whereof I have hereunto set my hand on the 5th day of January, 1916.

ALFRED C. GILBERT.