A. C. GILBERT.

TOY BUILDING ELEMENTS.

APPLICATION FILED OCT. 8, 1915.

1,261,019. Patented Apr. 2, 1918.

Fig. 1.

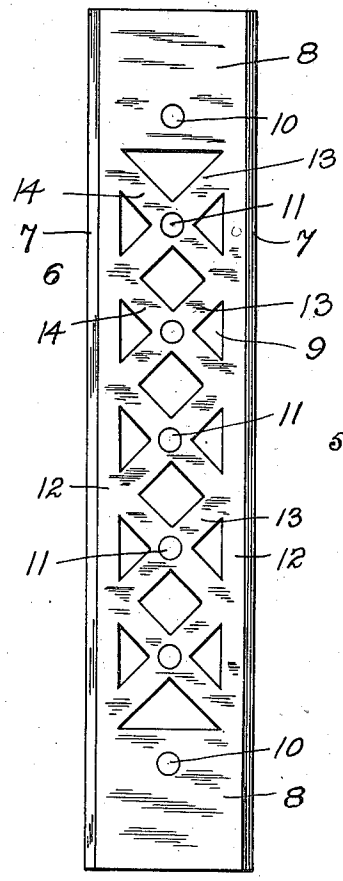


Fig. 2.

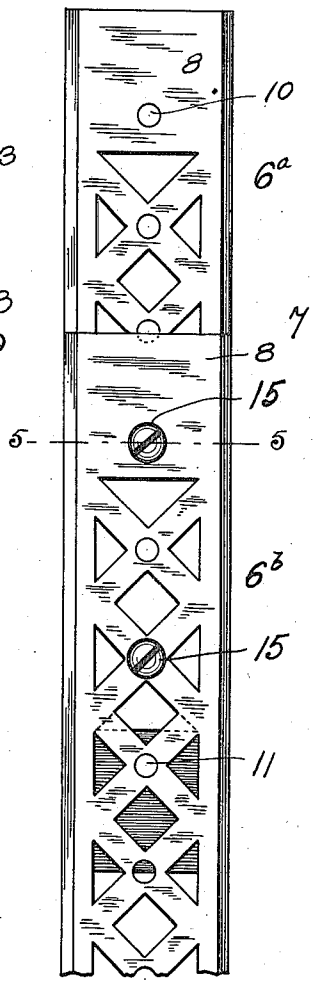


Fig. 3.

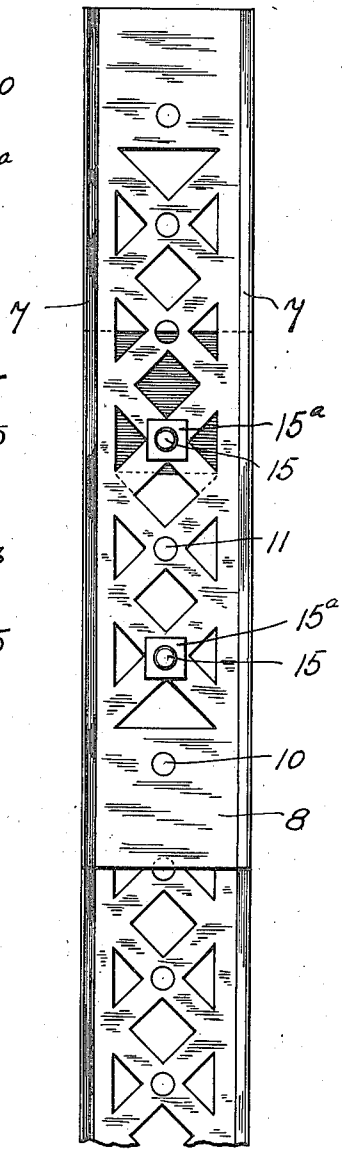


Fig. 4.

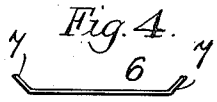
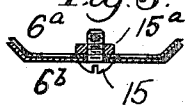


Fig. 5.



WITNESS

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TOY BUILDING ELEMENT

1,261,019. Specification of Letters Patent. Patented Apr. 2, 1918.

Application filed October 8, 1915. Serial No. 54,853.

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 Elements, of which the following is a full, clear, and exact description.

This invention relates to building construction, and more particularly to a toy building construction which simulates in appearance the modern structural steel used in building sky scrapers, bridges and similar structures.

The primary object of the invention is to provide a channeled strip or plate for the purpose indicated, which while structurally different from the well-known commercial structural members is adapted to be combined with a plurality of like elements in such a manner that a very close simulation of a modern steel frame-work can be readily built. More particularly, my object is to provide a plate or strip which may be very readily connected with a similar strip by an overlapping connection which is adjustable, so that when a bar or strip of predetermined length is required for building any particular structure the requisite length may be readily obtained by building up the strip from a number of overlapping sections. Again, it is my object to provide a connection or joint between the meeting ends of adjacent strips which is very simple in form, and yet holds the strips rigidly in alinement under considerable stresses.

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 front elevation of a toy building element embodying my improvements;

Fig. 2 is an outside elevation of the joint or connection between adjacent strips;

Fig. 3 is an inside view of the parts shown in Fig. 2;

Fig. 4 is an end view of Fig. 1; and

Fig. 5 is a section on line 5—5 of Fig. 2.

I shall first describe the detail construction of the particular strip or element selected for illustration in Fig. 1. The strip or plate 6 is formed of thin sheet metal, and has flanges 7 bent up integrally therefrom along the side edges. These flanges are bent up at the same face of the strip, and give the latter a channeled section as shown in Fig. 4. Owing to the fact that the strip is made of thin sheet metal, it possesses as a whole a certain resiliency which enables it to yield somewhat when placed in assembled position, as hereinafter explained. At the respective ends of the strip, the body thereof is provided with solid portions 8, while the intermediate portion of the strip is punched or cut out to form a lattice portion 9. The solid end portions 8 are provided with perforations 10 in the center line of the strip, and the lattice portion 9 is provided with a plurality of similar perforations 11 arranged in line with the perforations 10. These perforations 11 are equidistantly spaced from each other, and in the particular form shown, the distance between each perforation 11 and the adjacent perforation 11 is the same as that from one of the perforations 10 to the adjacent perforation 11. Thus, the perforations of the whole series are equidistantly spaced from each other. Moreover, in the particular form shown, the perforations 11 are formed in integral truss members which extend between and connect the angular side portions 12 of the lattice portion of the strip. Furthermore, in the particular form shown, a plurality of diagonal truss members 13 extending parallel to each other at suitable distances intersect similar diagonal truss members 14, and the perforations 11 pass through the strip at the intersection of the truss members 13 with the truss members 14.

In Fig. 2 I show an upper strip 6^a connected endwise to a lower strip 6^b by an overlapping connection. It will be obvious that by providing each strip with a plurality of equi-distantly spaced perforations two strips or sections may be connected in different ways by means of bolts 15 passing through the registering perforations, so as to produce composite strips of various lengths. In the particular example shown in Figs. 2 and 3, the strips or sections 6^a, 6^b overlap each other to a considerable extent, so that the total length of the composite strip is only slightly greater than the length of one of the sections. One of the bolts 15 passes through the end perforation 10 of the lower strip 6^b, and through one of the intermediate perforations 11 of the upper

strip 6ª, while another bolt 15 passes through one of the intermediate perforations 11 of the lower strip and through the lowermost intermediate perforation 11 of the upper strip. Of course, this arrangement is merely given as an example, because the arrangement of the parts may be greatly varied, and in many instances, it is only necessary to use one connecting bolt or its equivalent. In the particular form shown, each bolt 15 is provided with a nut 15ª, and the head of each bolt is furnished with a screw driver nick or slot so as to facilitate assembling and disassembling.

It will be observed from Fig. 5, that in forming an overlapping joint between two strips or sections the adjacent portions of the strip nest together rather closely when the fastening bolt or bolts have been placed in position. This is due to the flexibility of the sheet metal strips, and particularly the side flanges thereof, which enables the adjacent strips to substantially conform to each other under the clamping pressure of the bolt or other fastening member.

The construction hereinbefore described has the particular advantage that when a toy building set is being used for the construction of a miniature sky scraper or bridge, and a strip or bar of definite length is required, such bar can be made up to approximately the required length by overlapping two or more sections in the adjustable manner described. Furthermore, the series of intermediate perforations with which the strip is provided can be used for various other purposes which suggest themselves to the builder, and as these intermediate perforations can be readily furnished, without interfering with the lattice or truss work (which combines lightness with considerable strength), the strip as a whole possesses close similitude to modern structural steel work, while at the same time its utility as a toy is very considerable.

It will be observed that the side flanges of each strip are divergent, which is a feature of importance in some aspects of the invention because it permits two strips to be readily nested or fitted together, as shown in Fig. 5, in spite of the fact that said strips are of the same cross-section. However, I do not claim this feature broadly in the present application, as the same is claimed in my application Serial No. 814,533, nor do I broadly claim herein the feature of nesting together two identical strips as claimed in said application.

It will be evident from the foregoing description that the strip herein described is of such construction that four strips may be assembled and interconnected to form a hollow girder or column of rectangular cross-section, as described in my Reissue Patent No. 14,250, dated January 16, 1917.

Without limiting myself to the precise construction shown, I claim:

1. A structural element for building up toy box girders and other structures, comprising a miniature structural member having an elongated body part of flexible sheet metal with turned in flanges at opposite side edges, said body part having a plurality of cut out sections forming a plurality of intersecting diagonal truss members, the intersections of said diagonal truss members being located in the median line of the strip, said cut out portion terminating some distance from the respective ends of the body part to form extended bearing portions, said extended bearing portions each having a substantially centrally disposed perforation for the reception of means for uniting the member with another member or members, and said body part being provided with a longitudinal series of perforations between and in line with said end perforations and located at the intersections of said diagonal truss members; substantially as described.

2. A structural element for building up toy box girders and other structures, comprising a miniature structural member having an elongated body part of flexible sheet metal with turned in flanges at opposite side edges, said body part having a plurality of cut out sections forming a plurality of intersecting diagonal truss members, the intersections of said diagonal truss members being located in the median line of the strip, said cut out portion terminating some distance from the respective ends of the body part to form extended bearing portions, said extended bearing portions each having a substantially centrally disposed perforation for the reception of means for uniting the member with another member or members, and said body part being provided with a longitudinal series of perforations between and in line with said end perforations and located at the intersections of said diagonal truss members, the spacing between any two of said intermediate perforations being the same as that between an end perforation and the adjacent intermediate perforation; substantially as described.

3. In toy building construction, the combination of two elongated strips of light, flexible sheet metal both having integral side flanges and presenting a channeled cross-section, each of said strips being stamped out throughout a considerable portion of its length to present an open lattice-work portion having diagonals intersecting each other substantially in the median line of the strip, each strip also having bearing portions at the ends, each strip likewise having a longitudinal row of spaced perforations, of which some are located at the

intersections of said diagonals while others are located in the aforesaid end bearing portions, said strips being placed end to end, and means for fastening the strips together, comprising fastening members passing through registering perforations of the strips; substantially as described.

4. A toy building element, comprising a miniature structural channel member constituted by a light flexible sheet metal strip having integral flanges bent up therefrom at both side edges thereof, said strip being provided near the respective ends with substantially central bolt-receiving perforations and being cut away throughout a considerable portion of its length to present a plurality of diagonals intersecting each other in the median line of the strip, and the strip being further provided with a plurality of perforations at the respective intersections of the diagonals in line with the end perforations; substantially as described.

In witness whereof, I have hereunto set my hand on the 7th day of October, 1915.

ALFRED C. GILBERT.