

June 10, 1930.

A. C. GILBERT

1,763,300

TOY BUILDING CONSTRUCTION

Filed May 10, 1927

2 Sheets-Sheet 1

Fig. 1.

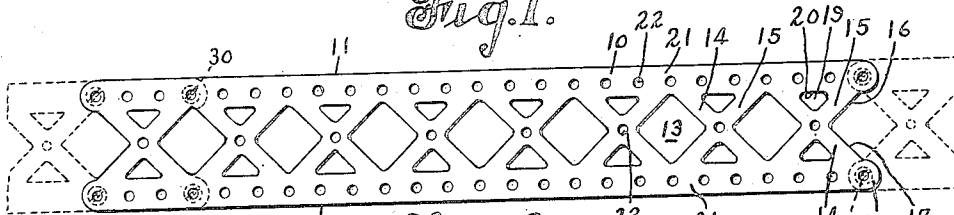


Fig. 2.

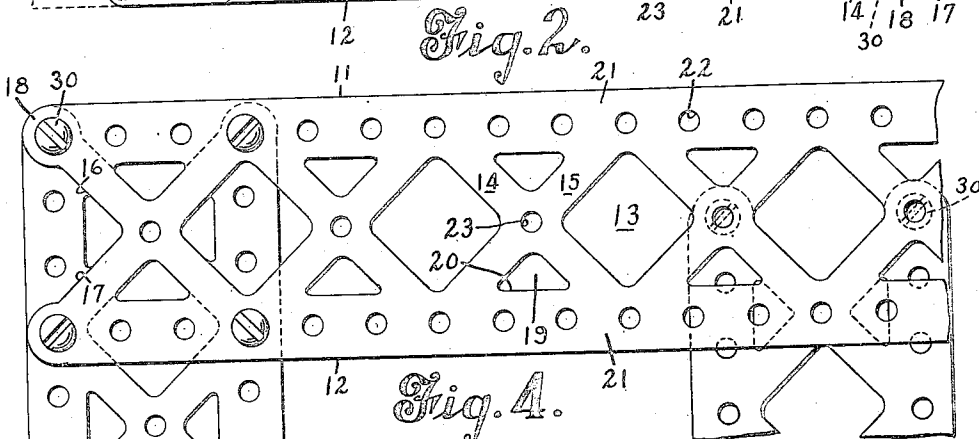


Fig. 4.

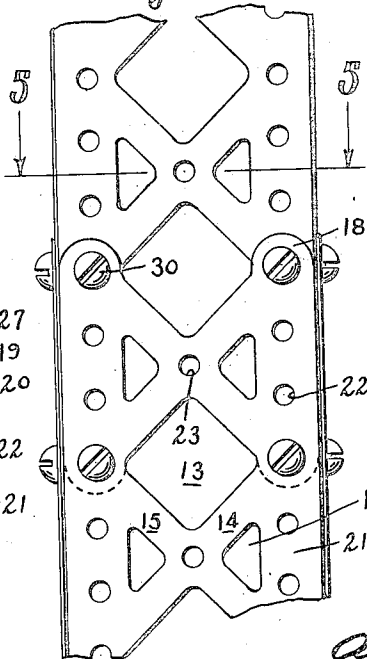


Fig. 5.

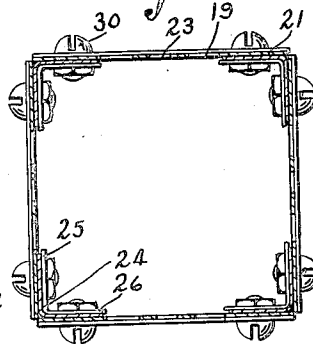
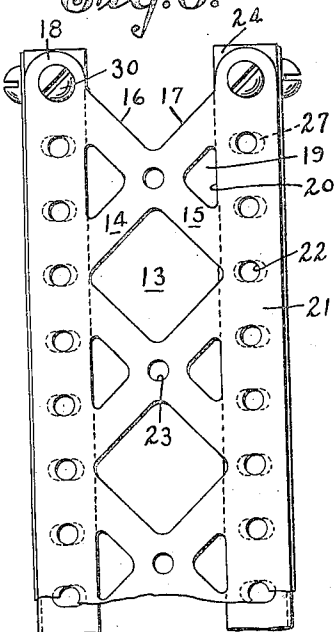


Fig. 3.



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2 Sheets-Sheet 2

Fig. 6.

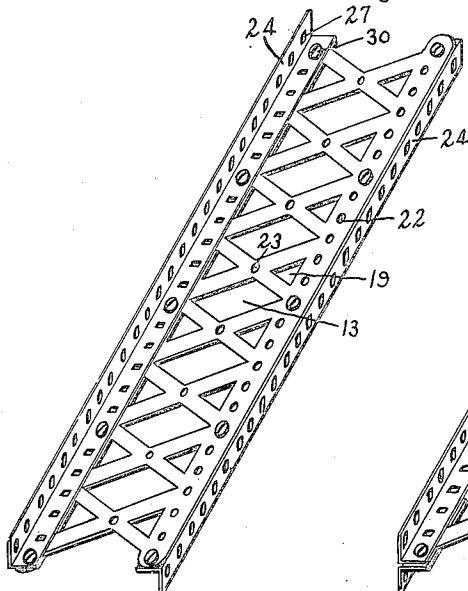


Fig. 7.

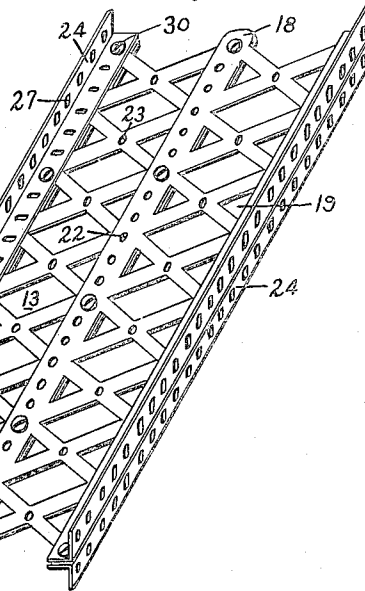


Fig. 8.

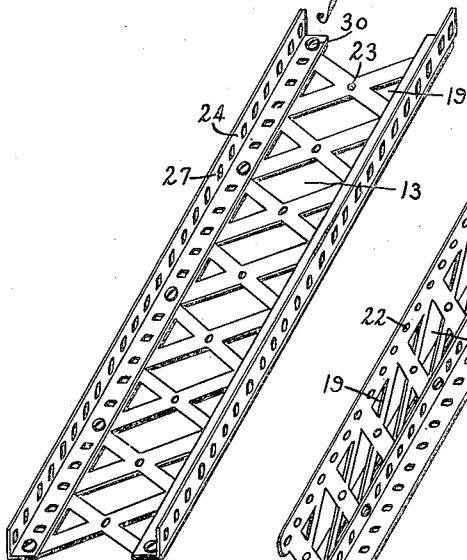


Fig. 9.

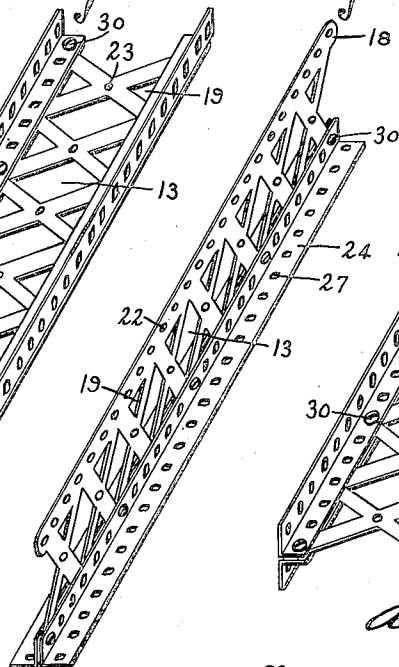
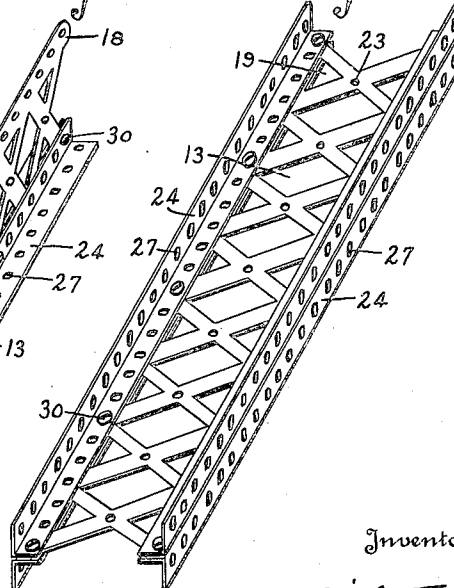


Fig. 10.



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UNITED STATES PATENT OFFICE

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TOY BUILDING CONSTRUCTION

Application filed May 10, 1927. Serial No. 190,231.

This invention relates to toy building construction, and more particularly to toy construction of fairly light sheet metal which simulates in appearance the modern structural steel used in building bridges, skyscrapers, towers, cranes and the like. Furthermore, my invention pertains especially to toy building construction which can be used to build various models where a hollow box column or girder simulating a commercial lattice girder is required.

One of the primary objects of my invention is to provide an improved form of strip which is adapted to be combined with a plurality of like strips in such a manner that a very close simulation of box girders, angle beams and other shapes and structures used in commercial steel work may be readily obtained.

Another object of this invention is to provide an improved form of strip or toy building element, which is adapted to be joined lengthwise to another similar one to form an extension thereof, and whereby an extended element may readily be provided of various lengths, as required by the toy model to be constructed.

Still another object of this invention is to provide an improved form of toy building element which is adapted to be associated with another element of similar form, whereby a sturdy, rigid angle piece or beam may readily be formed for use in various toy models.

Still another object of the invention is to furnish an improved construction of hollow box girder or column.

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 drawings:

Fig. 1 is a side view of a toy building element or strip, embodying the features of this invention and from which toy structures may readily be formed;

Fig. 2 is a side elevation of a corner structure or angle piece or beam, formed by joining two toy building elements, such as shown in Fig. 1;

Fig. 3 is an elevation of a toy girder or column, formed by the use of a plurality of the elements of this invention, the strips being joined together by a novel form of angle strip;

Fig. 4 is an elevational view, showing one manner of joining two girders or columns, like that of Fig. 3, together;

Fig. 5 is a section on line 5—5 of Fig. 4, and

Figs. 6 to 10 inclusive, illustrate different forms of beams which the strip of this invention is capable of forming in combination with the novel form of angle strip.

The toy building element or strip 10, from which various models and structures may be formed, comprises a strip of relatively thin metal, preferably punched from sheet metal, and is of a novel form of structure, both in contour and with respect to the disposition of openings and perforations therein. As shown in full lines in Fig. 1, strip 10 is of elongated length, having straight parallel side edges 11 and 12. Intermediate the side edges 11 and 12, the strip is cut away to form a series of openings 13 and crossed diagonals 14 and 15, which, in this instance, are at right angles to each other and substantially at an acute angle of 45° to the longitudinal axis of the strip. At each end of the strip, a portion of the diagonals 14 and 15 there disposed form an end edge of somewhat irregular contour. An edge portion 16 of the diagonal 15 extends from substantially the longitudinal center of the strip toward the strip edge 11, and the edge portion 17 of the diagonal 14 extends from the same point toward the strip edge 12. The edge portions 16 and 17 are interrupted and joined to the edges 11 and 12 respectively, by arcuate end edge portions 18. A substantially V-shaped end edge is, therefore, formed, whereby when two strips 10 are joined together, end for end, as shown in dotted lines at the right in Fig. 1, an opening will be formed therebetween, which is substantially of the same shape as the openings 13.

Triangular openings 19 between the diagonals 14 and 15, and between the intersection thereof and the edges 11 and 12, are also provided in the strip 10. An edge 20 of each

triangular opening is directed parallel with the adjacent strip edge 11 or 12, and the series of edges 20 are in alignment lengthwise of the strip 10. This arrangement provides a strip marginal portion 21 at each edge 11 or 12, and produces a visual effect of two separate narrow strips at each side of the strip 10. Each marginal portion 21 is constituted by the material between the edge 11 or 12, and the series of edges 20. The marginal portions 21 are joined together by the crossed diagonals 14 and 15. Two of the corners of the opening 13 are directed respectively toward the edges 11 and 12, and lie in line with the aligned edges 20, thus adding to the effect above noted, and separating the marginal portions 21 at intervals along the length of the strip 10. Extending as they do cornerwise across the strip 10 from one marginal portion to the other, and being disposed between the diagonals 14 and 15, the openings 13 are relatively large, thereby permitting access through the strip at various points, whereby the same may be readily secured to another part. The openings 13 are preferably large enough to permit the insertion therebetween of the finger of the user, or a suitable tool, whereby the fastening parts or screws 30 may be held while assembling the parts together.

A series of spaced apart perforations 22 are formed in each marginal portion 21. The perforations 22 are preferably spaced apart equally the entire length of the strip, and at a amount equal to the spacing between perforations in other toy building elements. Preferably, the arrangement is such that certain of the perforations 22 in each marginal portion 21 lie in line with each of the diagonals 14 or 15. The perforations in each marginal portion are opposite and are preferably spaced apart transversely of the strip 10 an amount which is a multiple of the longitudinal spacing, with respect to the length of the strip, of the perforations 22. The perforations 22, which are in line with the diagonals, are also preferably spaced apart an amount which is a multiple of the longitudinal spacing of the perforations 22 in each marginal portion, in this instance, this spacing being equal to the spacing between opposite perforations 22 in the marginal portions 21.

A perforation 23 is provided in the material at the intersection of the diagonals 14 and 15. Each of the perforations 23 are spaced apart lengthwise of the strip 10 an amount which is a multiple of the longitudinal spacing of the perforations 22 in the marginal portions 21, and in this instance, this spacing is equal to the spacing between opposite perforations 22 in the marginal portions 21, and to the spacing between the perforations which are in line with the diagonals 14 and 15. The perforations 23, in this in-

stance, are disposed with respect to the perforations 22 so as to be intermediate the perforations 22 which are in line with the diagonals and to also be intermediate the edges 11 and 12 of the strip.

An angle beam may be formed by the use of two strips 10, secured together at their ends, as illustrated in Fig. 2. Fig. 2 also illustrates a manner of joining the end of one strip intermediate the ends of another by using the intermediate perforations 23 in the latter and the end perforations 22 in the former.

For use in combination with a strip 10 in the construction of certain models, an angle strip 24 is provided. The angle strip 24 is used in combination with the strip 10, to form a square girder or beam, as illustrated in Figs. 3 to 5 inclusive, and is especially useful in this structure, due to the novel arrangements of features thereof. Each portion 25 and 26 of the strip 24, and which are at right angles to each other, is provided with a series of perforations 27, all of which are elongated in a direction transversely to the portion in which they are located. By elongating both series of perforations 27, a girder, constructed by the use of these strips as connecting means for the strips 10, may be equally expanded laterally to permit the connection thereto of a similarly formed girder, by inserting the end of one into the expanded end of the other, whereby the completed extended girder will be substantially square in cross section along its entire length.

The angle strip 24 is also used in combination with the strip 10, as illustrated in Figs. 6 to 10 inclusive, wherein the angle strip 24 is shown connected to the strip 10 in various ways to form beam sections, such as reverse angles or Z beams in Fig. 6, double width I-beams in Fig. 7, channel beams in Fig. 8, T beams in Fig. 9, and single width I-beams in Fig. 10.

By the provision in a construction toy of the novel form of strip 10, embodying the features of this invention, it is possible to construct an elongated strip by joining together a plurality of strips end to end, the combined strip being of fewer parts than has heretofore been possible by the use of other forms of strip of a length equal to those of this invention, and in which combined or elongated strip there will be a continuity of appearance throughout its length due to the formation of an opening between the ends of the connected strips which is substantially the same in form and size as those in the body of each strip, whereby the combined strip will appear to be a one-piece structure. The feature of this invention which permits the construction above referred to, consists in the novel form provided at each end of the strip 10. In view of the above

result made possible by this feature, a saving of material is obtained whereby the cost of making the toy is reduced and due to the large opening formed by the V end shape of adjoining strips and in the body portion of each strip, the assembly of one strip to the other is facilitated by permitting ready access through the strip of a user's finger or of a tool to engage, for instance, the nut of the securing bolt 30.

From the above, it will be seen that the provision of a toy building element or strip, constructed according to the above description, permits the joining of one strip to a part having equally spaced and similarly arranged perforations to form a variety of structures. It will be further noted that the structures formed will be of rigid construction while being composed of a minimum number of parts, due to the form of the element used. Various changes may be made in the details of the construction without departing from the spirit of the invention and the scope of the appended claims.

What I claim is:

1. A square hollow girder, comprising a plurality of elongated strips of thin material, having parallel side marginal portions interconnected by a plurality of diagonal portions, said diagonal portions forming substantially square-shaped openings disposed intermediate the marginal portions and forming at the ends of said strip a V-shaped end edge, said strip having a diagonally disposed series of perforations in alignment with each of said diagonal portions, said diagonal portions also forming a series of triangular openings adjacent each marginal portion, the square-shaped openings in said strip being disposed cornerwise with respect to the marginal portions, a corner of each square-shaped opening being disposed in alignment with the inner edge of each marginal portion, said strip having a longitudinally extending series of perforations in each of said marginal portions, certain of the perforations in the diagonal series of perforations being disposed in and being one of the longitudinal series of perforations in said marginal portions, said strips being disposed at right angles to each other, with the side edges of one extending along the side edges of another, and a strip of material right angular in cross section extending along the adjacent side edges with the first mentioned strips, said second mentioned strip having a series of transversely elongated openings in each of its side portions, and means passing through the elongated openings in the angle strip and through the openings in the marginal portions of the flat strips to secure these strips together.

2. In a construction toy, a structure comprising a plurality of elongated strips of material, each having parallel side marginal

portions interconnected by a plurality of diagonal portions, said diagonal portions forming substantially square shaped openings disposed intermediate the marginal portions, and forming at the ends of said strip a V-shaped end edge, said strip having a diagonally disposed series of perforations in alignment with each of said diagonal portions, the square shaped openings in said strip being disposed cornerwise with respect to the marginal portions, the corners of each opening being disposed in alignment at the inner edge of each marginal portion, said strip having a longitudinally extending series of perforations in each of said marginal portions, certain of the perforations in the diagonal series of perforations being disposed in and being one of the longitudinal series of perforations in said marginal portions, said strips being disposed at right angles to each other with the side edges of one extending along the side edges of another, and a strip of material right angular in cross section extending along the adjacent side edges of the first mentioned strips, said second mentioned strip having a series of transversely elongated perforations in each of its side portions, and means passing through the perforations in the angle strip and through the openings in the marginal portions of the flat strips to secure these strips together.

3. A square hollow girder, comprising a plurality of elongated strips of thin material having parallel side marginal portions interconnected by a plurality of diagonal portions, said diagonal portions forming substantially square-shaped openings disposed intermediate the marginal portions, and forming at the ends of said strips a V-shaped end edge, the square-shaped openings in said strips being disposed corner-wise with respect to the marginal portion, a corner of each square-shaped opening being disposed in alignment with the inner edge of each marginal portion, said strips having a longitudinally extending series of perforations in each of said marginal portions and being disposed at right angles to each other with the side edges of one extending along the side edges of another, and a strip of material right angular in cross section extending along the adjacent side edges of the first mentioned strips, said second mentioned strip having a series of transversely elongated openings in each of its side portions, and means passing through the elongated openings in the angle strip and through the openings in the marginal portions of the flat strips to secure these strips together.

In witness whereof, I have hereunto set my hand this 6th day of May, 1927.

ALFRED C. GILBERT.