

March 29, 1938.

J. E. McLOUGHLIN

2,112,247

CONSTRUCTIONAL TOY AND ELEMENTS THEREOF

Filed Nov. 4, 1936

4 Sheets-Sheet 1

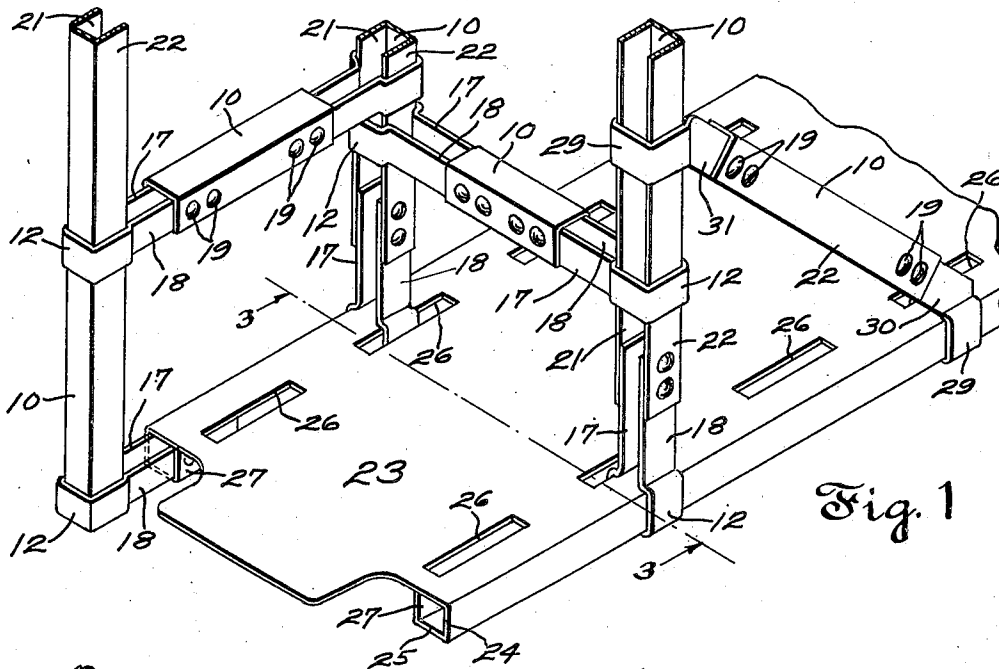


Fig. 1

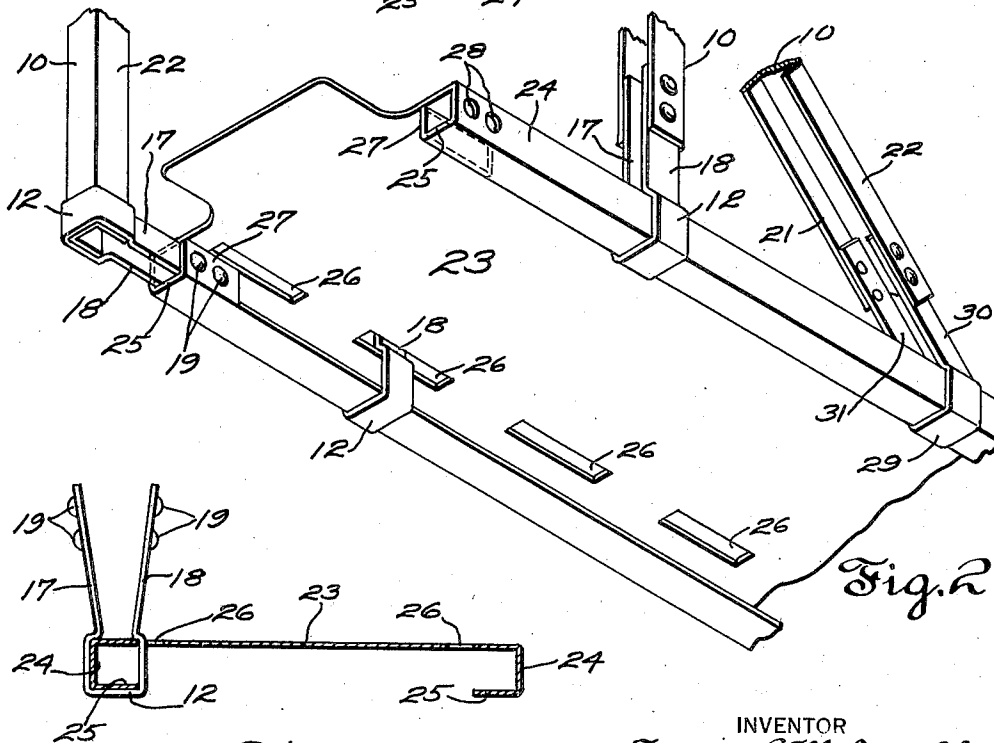


Fig. 2

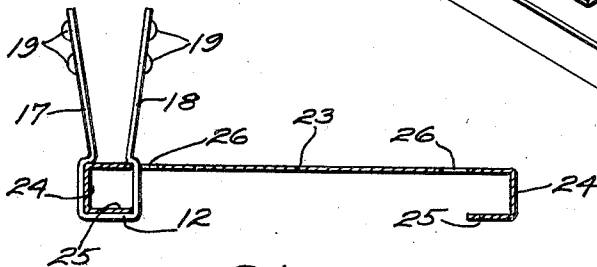


Fig. 3

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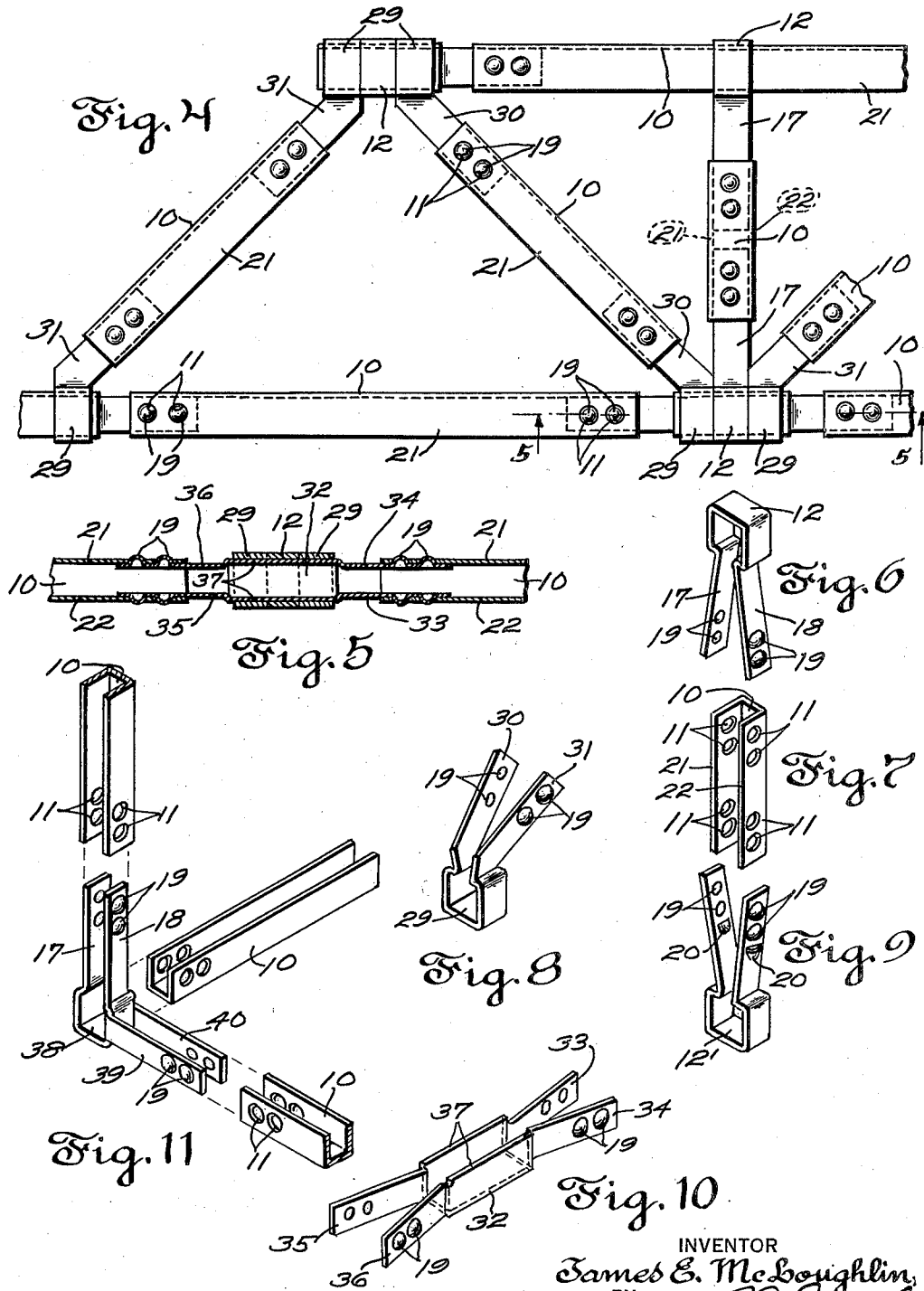
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4 Sheets-Sheet 2



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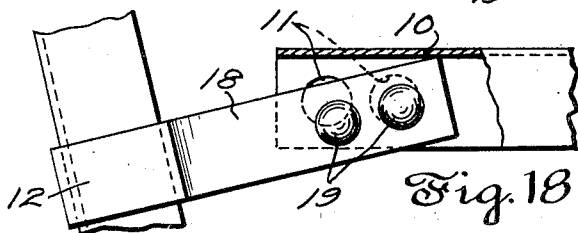
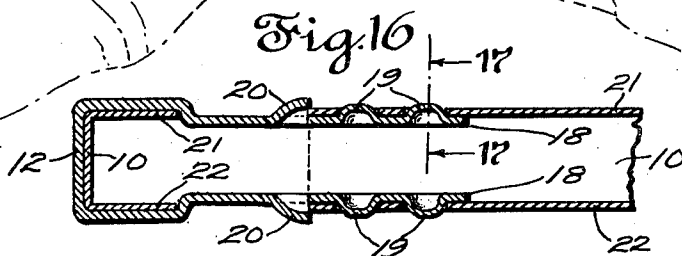
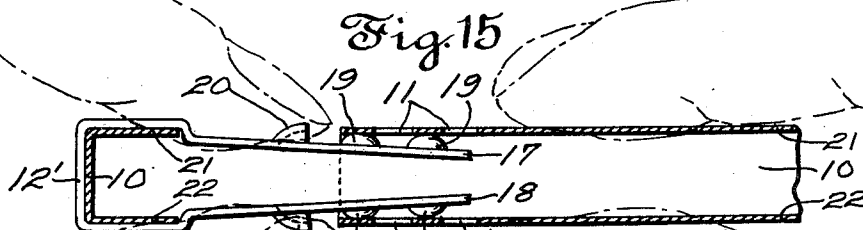
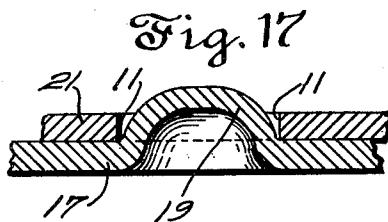
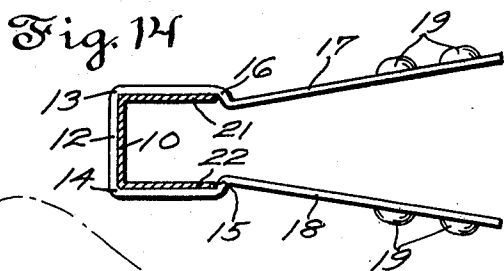
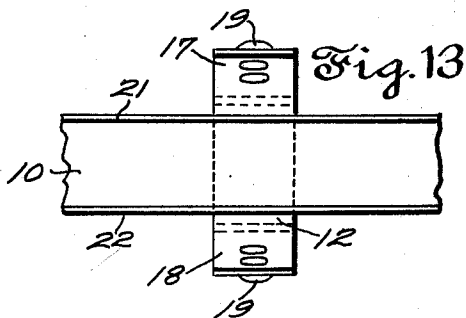
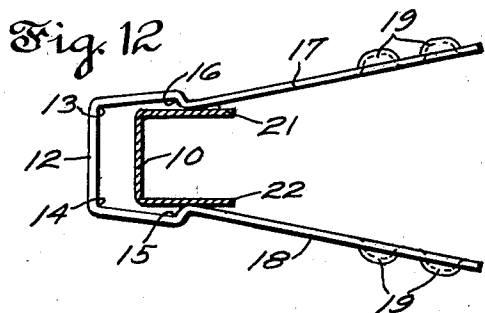
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CONSTRUCTIONAL TOY AND ELEMENTS THEREOF

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4 Sheets-Sheet 3



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CONSTRUCTIONAL TOY AND ELEMENTS THEREOF

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Fig. 26

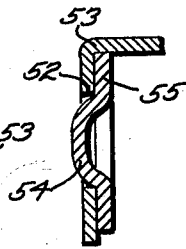
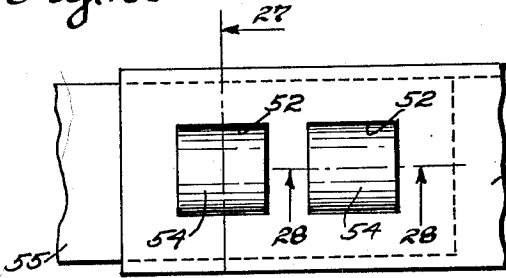


Fig. 28

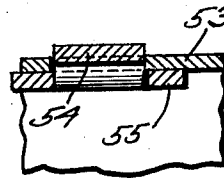


Fig. 23

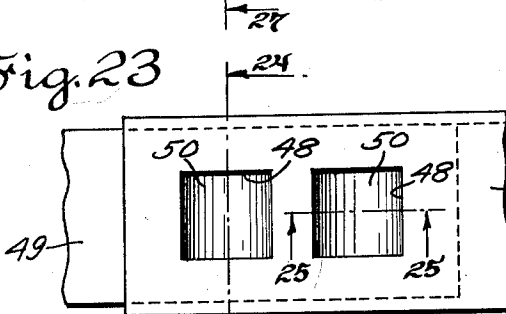


Fig. 27

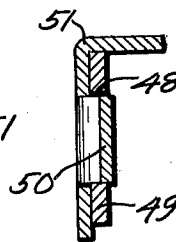


Fig. 25

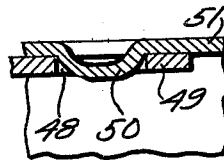


Fig. 20

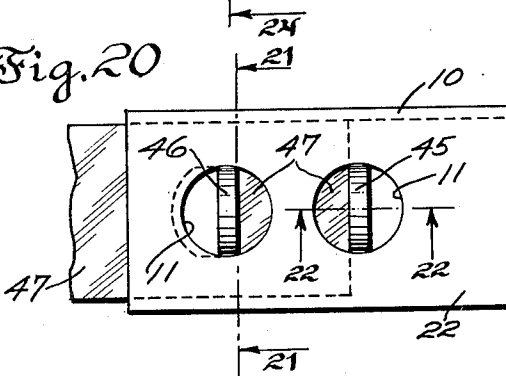


Fig. 24

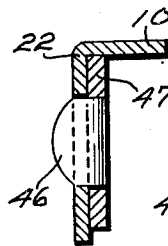


Fig. 22

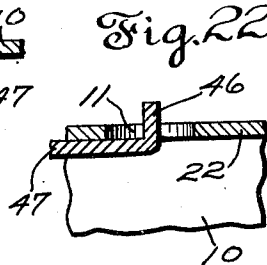


Fig. 21

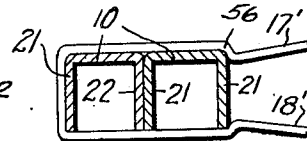
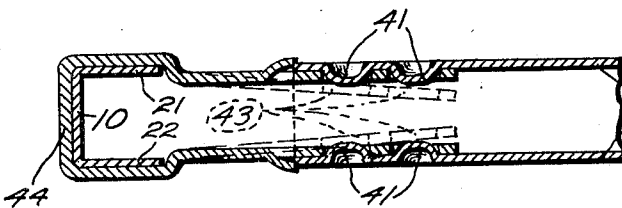


Fig. 19

Fig. 29

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CONSTRUCTIONAL TOY AND ELEMENTS
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Application November 4, 1936, Serial No. 109,063

23 Claims. (Cl. 46—29)

This invention relates to constructional toy elements and combinations thereof particularly designed for use in the building and rebuilding of various toy structures of a type possessing extraordinary appeal to the minds of boys.

Prime sources of such appeal lie in the faithfulness with which a toy structure simulates in nature the actual industrial structure it is intended to represent; in the sturdiness of the structure when completed; in the ease and positiveness with which the toy elements may be connected together and taken apart again; in the range of selectivity of relationships in which the elements may be assembled and reassembled to represent as large a variety as possible of actual structures; and in the immunity of the toy elements to damage or distortion in their repeated use.

From the standpoint of the manufacturer of such toys, prime objectives are low cost of production so that sets comprised of a larger number of toy elements may be sold at a lower price and such design of the various parts as will permit of their large quantity production with a minimum dependence upon skilled workmanship, accuracy of dimensions, and carefulness of handling in the processes of manufacturing and shipping the product.

In accordance with the above mentioned desirable characteristics of a constructional toy and its elements, one of the objects of these improvements is to provide toy elements which, as individual pieces and when assembled in a composite structure, shall forcefully resemble structural iron work as it appears in the skeleton frame structures of actual buildings, bridges and the like. This involves preferably the absence of visible auxiliary or connecting devices frail in nature or provided with unused projections or in other ways foreign in appearance to the efficiency and sturdiness of actual structural iron or steel work.

Another object of the invention is to make as large use as possible of strip stock of uniform width as raw material from which my improved toy elements may be produced thus eliminating the loss occasioned by scrap when irregularly shaped pieces must be blanked from sheet stock.

Another object of the invention is to make use of elongated members having the cross sectional shape of a U-beam, I-beam, Z-beam, or the like, in place of tubular members of any cross sectional shape, partly because of the less material and lower cost involved, and partly because

of the greater faithfulness with which the toy may resemble actual structural steel work.

A further object of the invention is to provide a rather stiff partially resilient clamp-like piece which may yield sufficiently to pass over and snap into embracing relationship to one such beam-like member and interlock with another such member in such manner that the two members may be held together in a considerable range of rigid relationships while readily detachable at will.

A further object of the invention is to accomplish the interlocking of the connecting piece with one or both of the members so that the means which produce the interlocking shall be made to give the appearance of rivet heads characteristic of structural steel work and prominent to the eyes of an observer when viewing the assembled structure.

A still further object is to provide a base of sheet metal so formed and perforated at suitable points such as at an edge of the base, that it may fit and coact with a connecting piece as above described in the same manner as does any one of the channel members or beams, thereby to provide in the structure of such base selective starting points for the building of a superstructure including the beam-like members and connecting pieces referred to.

The foregoing and other general objects together with more particular objectives by which they are achieved will become plain from the following description in which reference is had to the accompanying drawings, wherein:

Fig. 1 is an isometric view of a base and typical parts of a superstructure comprised of toy elements embodying the present improvements.

Fig. 2 is an isometric view looking upwardly at the bottom of the structure shown in Fig. 1, certain of the parts being shown as broken off.

Fig. 3 is a cross sectional view of the base taken on the plane of line 3—3 in Fig. 1 looking in the direction of the arrows and showing only one of the connecting pieces, freed from its engagement with the U-beam member which it is adapted to support.

Fig. 4 is a side elevation showing in preferred actual size various elements of my improved constructional toy assembled in relationships characteristic of bridge girders and trusses.

Fig. 5 is a fragmentary view taken in cross section on the plane 5—5 in Fig. 4 looking in the direction of the arrows.

Figs. 6, 7 and 8 are respectively perspective views of different elements employed in the as-

semblies of Figs. 1 and 4 detached from their associated elements.

Fig. 9 is a perspective view of a modified form of the connecting piece shown in Fig. 6.

Fig. 10 is a perspective view of the 4-armed connecting piece of Fig. 5.

Fig. 11 is an exploded perspective view of a modified form of 4-armed connecting piece by means of which the three channel members shown slightly spaced therefrom may, when assembled, be held in the relationship of the corner edges of a cube.

Fig. 12 is an enlarged edgewise view of my improved connecting piece of Fig. 6 in the process of being sprung over one of the channel members in crosswise relation thereto, the channel member being shown in cross section.

Fig. 13 is a view looking from the right at Fig. 12.

Fig. 14 shows the connecting piece of Fig. 12 when it has sprung home to the normal position it assumes in relation to the channel member which it saddles.

Fig. 15 shows a modified form of the connecting piece of Fig. 14 in the process of being inserted into the open end of a second channel member with which it is adapted to interlock; the fingers of the operator's hand being indicated in broken lines.

Fig. 16 shows the parts of Fig. 15 in interlocking assembled relationship.

Fig. 17 is a much enlarged detail view of the boss locking construction taken in section on the plane 17—17 in Fig. 16.

Fig. 18 is a side view of the parts shown in Fig. 16 with one wall of the channel member partly broken away to illustrate relative movement of the parts by which the bosses may be forced out of engagement with the holes in the walls of the channel member without of necessity requiring the arms of the connecting piece to be squeezed together as a separate operation.

Fig. 19 shows a modification of the parts of Fig. 16.

Fig. 20 is a side view of the connecting ends of a channel member having apertures like that of Figs. 16 and 18 and of a connecting piece having modified projections for engaging the aperture, the parts being shown on an enlarged scale.

Fig. 21 is a fragmentary view taken in section on the plane 21—21 in Fig. 20 looking in the direction of the arrows.

Fig. 22 is a fragmentary view taken in section on the plane 22—22 in Fig. 20 looking in the direction of the arrows.

Fig. 23 is a view similar to Fig. 20 showing a still further modified form of interlocking projections and apertures.

Fig. 24 is a fragmentary view taken in section on the plane 24—24 in Fig. 23.

Fig. 25 is a fragmentary view taken in section on the plane 25—25 in Fig. 23 looking in the direction of the arrows.

Fig. 26 is a view similar to Fig. 23 showing a still further modified form of interlocking projections and apertures.

Fig. 27 is a fragmentary view taken in section on the plane 27—27 in Fig. 26 looking in the direction of the arrows.

Fig. 28 is a fragmentary view taken in section on the plane 28—28 in Fig. 26 looking in the direction of the arrows.

Fig. 29 shows a modified form of the clamp portion of the connecting piece of Fig. 12 shaped

to fit and embrace two beam-like members similar to the single one of Fig. 12.

While parts having many and sundry forms differing in detail from those shown in the above described drawings may be constructed upon the principles which underlie these improvements, those here chosen to illustrate the invention consist in the main of the following:

Elongated members 10 may possess any cross sectional shape which preferably, though not necessarily, provides for equally spaced edges or corners related to one another as the corners of a square. This condition is equally possible to so called U-beams as shown and to I-beams, Z-beams, square tubing, square rod or the like. The channel or U-beam members as shown may be bent to shape from strip stock or otherwise produced to such cross sectional dimensions as shall enable the channel member to occupy and nicely fit and register with the four corners of a truly square hole or corresponding opening through an encompassing object. In other words, if the channel members were provided with a fourth wall to comprise truly square tubing, the exterior surface of this fourth wall would coincide with the plane in which are located the two exposed edges of the channel member. This dimensional condition enables the channel member to fit with other parts in the same manner in all of its four possible different relationships thereto as regards the disposition of its open side. Each channel member is provided near each of its ends with one, two or more longitudinally spaced holes 11 in each of its opposite side walls, the holes in one side wall respectively aligning with the holes in the other side wall.

The connecting piece 12 of Figs. 6, 12, 13 and 14 is made from strip stock of such thickness and strength against bending that it must be formed by tools to substantially the shape shown in Fig. 14 before it is put into use or can be manipulated by the hands of the operator in the manner shown in Fig. 25 for rigidly connecting two of the channel members as shown in Fig. 16. The strip from which connecting piece 12 is made is sharply bent at four points 13, 14, 15 and 16, equally spaced midway the length of the strip thus forming four corners and three complete sides normally related respectively as the corners and sides of a true square. Thus is formed a C-type clamp dimensioned to have a free sliding fit along the length of a channel member which it may saddle. If neither end of the channel member is free to be inserted through this clamp formation in the connecting piece 12, the latter may be slightly sprung open by shoving it crosswise over the channel member and will then snap back into its normal form in saddling relation thereto in the manner indicated by Figs. 12 and 14. Material of such resilience is chosen as will permit this degree of yielding of the connecting piece within its elastic limit and without causing permanent distortion. The connecting piece 12 in Figs. 12 and 14 can as well be thrust downwardly, upwardly, or toward the left in relation to the channel member as the latter is positioned in Figs. 12 and 14 because the disposition of the open side of the channel member is no factor in the ability of the connecting piece to engage its four corners in all of these different relationships. When its projecting arms 17 and 18 are free, a convenient way of removing connecting piece 12 from its saddled relation to the channel member is to press it toward alignment with the channel mem-

ber with a manner of action like that of closing the blade of a jack-knife whereupon the shoulders 15, 16 will readily cam over the edges of the channel beam and automatically spread the connecting piece to its sprung shape as in Fig. 12, thus enabling its easy removal from the beam member without separate manipulation of arms 17 and 18 for forcing them apart and without requiring the connecting piece to be moved to the end of the beam member for detaching it therefrom. Because of the lengthwise continuity of the walls of the channel member there will be no appreciable yield of its side walls toward each other as a result of any pressure from without which can be exerted by the clamping action of the connecting piece even though the channel member be made of thinner stock than the connecting piece. I may, if desired however, make the channel member of sufficiently thin stock to permit it to spring a small amount when subjected to sufficient force of clamping by the connecting piece.

The diverging arms 17 and 18 of the connecting piece 12 are inwardly offset from the side walls of the clamp formation with which they are continuous by an amount approximately equal to the combined thickness of the stock of the connecting piece plus the stock of the channel member, this offset being in part produced by the bends at points 15 and 16 in the connecting piece. Thus, when the connecting piece arms 17 and 18 are forced into parallel relationship, as they are shown held in Fig. 16, the outer surfaces of these arms will align truly with the inner surfaces of the side walls of a channel member having the same size and shape as the channel member saddled by the connecting piece. Arms 17 and 18 further possess such resilience that they may be flexed to the position shown in Fig. 15 and indefinitely retained in their positions shown in Fig. 16 without exceeding their elastic limit or causing permanent distortion thereof. Two dome shaped bosses 19 are pressed outwardly from the metal of the arms 17 and 18 near the ends thereof and spaced to accord with the spacing of holes 11 in the side walls of channel member 10. Figs. 15 and 16 clearly show the manner of manipulating the connecting piece for inserting it within the open end of a channel member to effect the assembled relation of parts in Fig. 16. The tendency of the arms 17 and 18 to spread apart causes the bosses 19 to snap into and occupy the holes 11 which they may fit with suitable snugness as illustrated on an enlarged scale in Fig. 17.

Hence is formed an interconnection of two channel members in perpendicular relationship exposing sufficient length of the arms 17 and 18 of connecting piece 12 between the channel members to provide for easy detachment of the parts by the application of the thumb and finger of the operator as shown at the left of Fig. 15. The corners 14 and 15 of the connecting piece 12 firmly grip any corners or edges of the beam-like member 10 with which they contact in the condition of parts in Figs. 15, 16 and 18.

In partially built toy constructions where either channel member is free to be swung in relation to the other channel member, the bosses of the connecting piece may be forced out of the channel member holes without using the fingers to press the arms 17 and 18 together in the manner indicated in Fig. 18, the contour of the bosses 19 being such as to make this possible. In other words, the sloping sides of the bosses

produce a component force in a direction to cause the bosses to cam out of the holes 11 without the necessity of grasping the connecting piece at all. A reverse kind of coaction between the sloping sides of the bosses and the edges of the holes causes the bosses to tend to center with or "find" the holes when the former have reached the neighborhood of concentricity with the latter so that a distinct tendency of the bosses to snap into engagement with the holes facilitates the quickness with which the parts may be caused to slide into boss locked relationship almost entirely by a sense of "feel". In a completed structure as illustrated in Figs. 1 and 4, both ends of each channel member are anchored against this jack knife type of uncoupling movement indicated in Fig. 18 because of the immovability of both terminal connecting pieces in a conjoined structure, so that there is no danger of the parts becoming accidentally separated by the kind of relative movement indicated in Fig. 18.

If desired to limit the extent to which the connecting piece 12 may be thrust into the open end of the channel member 10, an eyelid projection or other form of stop, 20, may be struck upwardly from the metal of each arm 17 and 18 to a sufficient height to be engageable by the ends of the spaced side walls 21 and 22 as shown in Fig. 16. Fig. 15 further indicates the assistance that may be given by the projection 20 to the grasp of the fingers upon the connecting piece 12 in the shoving together of the parts.

To serve as a support and to provide fixedly related starting points for the building of a superstructure employing the novel combination of beam-like members 10 and connecting pieces 12, I provide a groundwork or base plate 23 shown in Figs. 1, 2 and 3. Any edge of such base plate may be bent downwardly to form the wall 24 and inwardly to form the wall 25, which walls may be dimensioned and spaced in accordance with the walls of the channel members 10. A slot 26 of suitable width may be provided in the base plate 23 in any appropriate or convenient location, the distance of whose nearest edge to the junction of the wall 24 with plate 23 shall preferably equal the overall dimension of the channel member 10 in cross section. The connecting piece 12 may thus have one of its arms 17 or 18 inserted through slot 26 and thereby fit and hug the walls 23, 24 and 25 of the base edge exactly as it fits and hugs any one of the channel members 10 when the latter is seated within the C-clamp portion of the connecting piece. Preferably the slot 26 is made long enough to accommodate two or three or more connecting pieces edge to edge therewithin so that uprights and angularly disposed braces as illustrated in Fig. 4 may derive support at juxtapositioned points on the base.

Figs. 1 and 2 further illustrate the manner in which a hollow square tube may in effect be formed from the sheet material of base plate 23 by extending the metal thereof to form a further wall 27. When this is done the walls 24 and 27 may be provided with holes 28 like the holes 11 in the channel members so that by this construction of its bent over edge, the base may receive and hold the arms 17, 18 of a connecting piece 12 whose C-clamp portion may thus form a foot anchorage for any one of the channel members 10 which it is desired to have serve as an upright and so supported outside the area of the base plate.

Fig. 8 shows a modified form of connecting

piece 29 having the same somewhat resilient C-clamp portion of four cornered shape as does connecting piece 12, but the arms 30 and 31 of the connecting piece 29 not only diverge but are angularly disposed instead of perpendicular in relation to a length of one of the channel members 10 when the latter is seated within and clamped by the connecting piece. The convenient use of connecting piece 29 if its angular relation to the channel members be 45 degrees is illustrated in the assemblage of parts in Fig. 4 to enable certain of the channel members to serve as corner bracing elements in the construction of truss and girder structures imitative of structural steel work as employed in actual bridges and building frames. However, the angular disposition of arms 30 and 31 may be other than 45 degrees with respect to the channel member hugged by the connecting piece.

Fig. 10 shows a further modified form of connecting piece 32 having a pair of resiliently held arms 33 and 34 at one of its ends and a similar pair of resiliently held arms 35 and 36 at its other end, both of which pairs of arms may be similar to the arms of the connecting piece 12, or if preferred may be similar to the arms of connecting piece 29. The central body portion 37 of connecting piece 32 may be comprised of a short length of structure conforming in cross sectional shape and dimensions to one of the channel members 10 so that other connecting pieces such as 12 and 29 may saddle and hug this central body portion 37 of connecting piece 32 as they would saddle and hug one of the channel members 10 itself. This relationship of parts and the use which may be made of same in truss work or girder construction is clearly illustrated in Fig. 4.

A still further modification of connecting piece 38 is shown in Fig. 11 designed to hold together in three directional relationship three of the channel members 10 which will thereby be assembled in the relationship of the three meeting edges of a cube. For this purpose the upright portion of connecting piece 38 is comprised of the usual C-clamp portion terminating in the usual spaced arms 17 and 18 while two additional spaced arms 39 and 40 may be formed from the same metal from which the rest of connecting piece 38 is cut and bent to extend laterally as shown. Both pairs of arms of the connecting piece 38 will preferably be formed to diverge when they are normally and resiliently positioned as do the arms 17 and 18 of the connecting piece 12.

Many modifications will occur to those skilled in the art whereby certain of the advantages residing in these improvements can be had with variations of detail. Fig. 19 illustrates that the dome shaped bosses 41 may be struck inwardly from the walls of a channel member 42, otherwise like channel member 10, thereby to engage with perforations 43 through the arms of a connecting piece 44 otherwise like connecting piece 12. The bosses 41 and perforations or holes 43 may be respectively like the bosses 19 and holes 11 except for their inverted relationship as between the channel member and the arms of the connecting piece.

In Fig. 20 the bosses 18 and 19 are shown to be replaced respectively by tongues 45 and 46 bent up from the metal of the arm 47 of a connecting piece otherwise similar to that of Figs. 6, 8, 9, 10 or 11. The tongue 45 may be bent up at the end of the connecting piece arm 47 while

the second tongue 46 may be struck up by a piercing and forming operation from the metal of the connecting piece arm in a well known manner. This construction is further shown by Figs. 21 and 22.

In Figs. 23, 24 and 25, square holes 48 in the arm 49 of the modified connecting piece are shown to be occupied by a sheared arch 50 struck from the metal of the modified channel member 51. This construction will not permit the jack knife type of relative movement illustrated in Fig. 18 nor permit the arches 50 to be caused to ride out of engagement with the holes 48 in such manner.

In Figs. 26, 27 and 28, square holes 52 in the modified channel member 53 are shown to be occupied by sheared arches 54 struck outwardly from the metal of the arm 55 of a modified connecting piece. This construction will permit the jack knife movement illustrated in Fig. 18 for causing the arches 54 to ride out of engagement with holes 52.

Other modifications which may be resorted to comprise the substitution for the holes 11 occupied by the locking bosses of recesses or cavities which may be pressed outwardly from the metal of the opposite side walls of the channel member of proper size to give entrance to the bosses 19 as do the present holes 11. While in this arrangement the bosses on the arms of the connecting piece would not be exposed through the walls of the channel member, the imitative resemblance of rivet heads might be preserved. By the construction shown in Fig. 17, opportunity is afforded to render the bosses more conspicuous through the expedient of finishing the connecting pieces, say by nickel plating, and finishing the outside walls of the channel members by applying a coating of colored lacquer such as red or blue, whereby marked contrast is produced playing up the bosses conspicuously.

While for purposes of clearer illustration certain edges of the connecting pieces in Figs. 1 and 2 are shown to fall flush with the corresponding edges of the overlapping walls of the channel members, attention is called to the preferred relationship of the width of the connecting piece to the dimensions of the channel member indicated by broken lines in Fig. 4 and by Figs. 21, 24 and 27. By this relationship of dimensions, the connecting pieces of these improvements may be insertable within square tubing which may be used in place of beams of skeletonized cross section. This ability is illustrated in Figs. 1 and 2 involving the use of the connecting strip retaining wall 21.

It will be understood that where as the connecting piece is herein shown to have a square clamp-like portion, it may if desired, be made of different rectangular shape, such for instance as that of the modified connecting piece 56 of Fig. 29 which enables it to fit and embrace two or more of the beam-like members disposed side-by-side. Certain features of these improvements are of equal usefulness and advantage if the connecting piece in its clamping portion be suitably shaped to encompass and hug toy members of other than rectangular shape or quadrilateral character and it is obvious that the toy member clamped by the connecting piece need not be hollow nor of skeletonized cross sectional structure but may be solid and made of any desired material.

With the understanding that the foregoing and many other departures from the particular details herein illustrated are intended to be included by

such language of the appended claims as is not in conflict therewith, I claim as my invention:

1. In a set of constructional toy elements, in combination, hollow ended beam-like toy members whose structure includes spaced longitudinally disposed walls so arranged that in cross section the terminal edges and/or junctional corners of said walls are related as are the four corners of a quadrilateral figure, and a connecting piece preshaped to form a four cornered C-type clamp having a wall gap between two of its corners providing a space through which a four cornered beam-like member may be inserted to a seating position within the clamp, together with arms resiliently carried in separated relationship by said clamp and projecting outwardly beyond its said wall gap and disposed to be inserted and retained between the spaced walls of one of said beam-like toy members for coupling the said members together.
2. In a set of constructional toy elements, the combination described in claim 1 in which the four corners of the said clamp are disposed respectively to register with and embrace the terminal edges and/or junctional corners of the walls of the said beam-like toy member when the latter is transversely seated within said clamp.
3. In a set of constructional toy elements, the combination described in claim 1 in which the said arms of the connecting piece comprise elongated portions of opposite walls of the said C-type clamp, each of the said portions being offset toward the other said portion in relation to its respective clamp wall.
4. In a set of constructional toy elements, the combination described in claim 1 in which the said arms of the connecting piece are resiliently carried by the said clamp in positions normally to diverge to a distance of separation near their free ends greater than is the distance between the said spaced walls of the beam-like toy member.
5. In a set of constructional toy elements, the combination described in claim 1 in which the spaced longitudinal walls of the beam-like toy members are flat and disposed in parallel planes and in which the said arms of the connecting piece are flat and diverge near their free ends to a greater distance of separation than is the distance between the said spaced walls of the beam-like toy members.
6. In a set of constructional toy elements, the combination described in claim 1 in which the said arms of the connecting piece comprise continuing portions respectively of the opposite walls of the said clamp, each of said arms being offset toward the other arm in relation to the clamp wall with which it is continuous by an amount approximately equal to the combined thicknesses of the wall of the clamp and the wall of the beam-like member engaged by the arm.
7. In a set of constructional toy elements, the combination described in claim 1 in which one of the said spaced walls of the said second toy member contains one or more holes in a portion thereof adapted to be placed contiguous to one of said arms of the connecting piece, and in which the last said arm of the connecting piece carries one or more projecting bosses disposed to enter within and approximately fill said hole or holes.
8. Releasable interlocking devices imitative of the appearance of riveted structural steel work when detachably assembled for building a constructional toy, comprising in combination with a toy element having an interior flat wall surface interrupted by one or more cavities, a component

toy element having an exterior flat surface resiliently held contiguous to the said interior wall surface of the first said element and provided with an upstanding boss or bosses located to occupy the said one or more cavities.

9. Releasable interlocking devices imitative of the appearance of riveted structural steel work when detachably assembled for building a constructional toy, comprising in combination with a toy element having a flat wall containing one or more round apertures, a component toy element having a flat surfaced portion resiliently held contiguous to the interior surface of the apertured wall of the first said element and provided with a dome shaped boss or bosses located to occupy the said one or more round apertures, whereby each boss is exposed through its corresponding aperture in a manner to resemble a rivet head.

10. Releasable interlocking devices as described in claim 8 in which the said one or more cavities and/or the said boss or bosses are shaped to have sloping edges adapted to cause each boss to cam out of engagement with its corresponding cavity when either of said toy elements is bodily moved in the plane of its said wall surface relative to the other said toy element.

11. As an article of manufacture, a connecting piece for use in constructional toys, comprising a strip of sheet metal of substantially uniform width transversely bent to form four corners defining a partially resilient C-shaped clamp-like portion having flat walls of sufficient stiffness to prevent permanent flexural distortion thereof by the force of finger pressure thereagainst, the metal of said strip being continued to form separated flat arms held in relatively diverging relationship by the resilient stiffness of the walls of said clamp portion of the connecting piece.

12. As an article of manufacture, a connecting piece as described in claim 11 in which three of the walls of the said clamp portion are of substantially equal extent lengthwise of the strip and in which the said four corners of the clamp portion are substantially rectangular.

13. As an article of manufacture, a connecting piece of stiff but somewhat resilient sheet material, for use in constructional toys, comprising a pre-shaped four cornered central portion forming a C-shaped clamp whose walls are elongated and offset to form arms extending outwardly in separated relationship from the open side of the said C-shaped clamp in the same general direction but diverging to such an extent that said arms are separated near their free ends more widely than are the corners of the C-shaped clamp portion of the connecting piece.

14. As an article of manufacture, a connecting piece for use in constructional toys, comprising a strip bent to form a stiff and partially resilient four cornered C-shaped clamp-like portion adapted to receive and slidably to embrace a hollow ended beam-like member of square cross section, and flat separated arms formed by continuations of said strip and extending from the open side of said clamp-like portion and so positioned that when the clamp-like portion embraces said member of square cross section, said arms project divergingly in side-by-side relation whereby the resilience of said clamp-like portion permits the arms to be forced into parallel relationship for causing the corners of said clamp-like portion to grip the corner edges of said member and for permitting the free ends of said arms to be inserted within the hollow end of a beam-like member.

15. In a set of constructional toy elements, the combination described in claim 1 in which the said arms are sufficiently long to expose portions thereof between the said beam-like toy members of sufficient extent to be grasped between the thumb and finger of the user's hand for thereby pressing the arms toward each other.

16. In a set of constructional toy elements, in combination, a hollow ended beam-like toy member whose structure includes spaced longitudinally disposed walls so arranged that in cross section the terminal edges and/or junctional corners of said walls are related as are the four corners of a quadrilateral figure, a base plate having its edge bent downwardly and inwardly to form a structure similar in cross section to the hollow portion of said beam-like toy member and having an aperture one edge of which accords in position with one of the said four corners of a quadrilateral figure, and a connecting piece preshaped to form a four cornered C-type clamp having a wall gap between two of its corners providing a space through which the bent over edge of said base plate may be inserted to a seating position within the clamp, together with arms resiliently carried in separated relationship by said clamp and projecting outwardly beyond its said wall gap, one of said arms being disposed to extend through the said aperture in the base plate and both of said arms being disposed to be inserted and retained between the spaced walls of the said beam-like toy member for coupling the latter to said base plate.

17. In a set of constructional toy elements, in combination, a toy member of square cross section, a base plate having its edge bent downwardly and inwardly and upwardly to form a structure comprised of spaced longitudinal walls so disposed that in cross section adjoining walls meet at the four corners of a quadrilateral figure, and a connecting piece preshaped to form a four cornered C-type clamp having a wall gap between two of its corners providing a space through which the said toy member may be inserted to a seating position within the clamp, together with arms resiliently carried in separated relationship by said clamp and projecting outwardly beyond its said wall gap and disposed to be inserted and retained between the said spaced walls formed by the bent over edge of the said base plate.

18. In a set of constructional toy elements, the combination described in claim 1 in which one of the said spaced walls of the hollow-ended toy member contains one or more holes in a portion thereof adapted to be contacted by one of said arms of the connecting piece, and in which the last-said arm of the connecting piece carries one

or more projecting bosses disposed to enter within and occupy said hole or holes together with an additional projection spaced from said bosses and adapted to abut against the end of said hollow-ended toy member to limit the extent to which the connecting piece may enter the same.

19. As an article of manufacture, a connecting piece for use in constructional toys, comprising a central body portion of U-shaped cross section forming spaced lateral walls, and a substantially flat arm supported at each end of each of said walls and resiliently positioned to diverge in an outward direction from the plane of the wall by which it is supported.

20. As an article of manufacture, a connecting piece for use in constructional toys, comprising a strip of sheet metal bent in parallel lines to form four corners defining a clamp-like portion having flat walls, the metal of said strip being continued to form substantially flat separated arms normally held in diverging relationship by the resilient stiffness of said walls of the clamp-like portion of the connecting piece, and two additional arms extending in separated relationship from one of the said flat walls of the clamp-like portion and supported thereby.

21. In a set of constructional toy elements, the combination defined in claim 1 in which the four corners of the said clamp are disposed respectively to register with and embrace corresponding corners of the said beam-like toy member when the latter is transversely seated within said clamp.

22. Releasable interlocking devices for detachably holding together the parts of a constructional toy, comprising in combination with a toy element having an interior substantially flat wall surface interrupted by one or more cavities, a component toy element having an exterior substantially flat surface resiliently held contiguous to the said interior wall surface of the first said element and provided with an upstanding projection or projections located respectively to occupy the said one or more cavities.

23. As an article of manufacture, a connecting piece for use in constructional toys, comprising a strip of sheet metal bent along parallel longitudinal lines to form spaced side walls producing in a portion of said connecting piece a substantially U-shaped cross section, said side walls being longitudinally extended at one end of said strip portion respectively to form substantially flat separated arms resiliently held in diverging relationship and likewise extended at the opposite end of said strip portion respectively to form similar substantially flat separated arms resiliently held in diverging relationship.

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