

Oct. 27, 1959

W. J. HOBSON
CONSTRUCTIONAL TOY
Filed Feb. 27, 1956

2,909,867

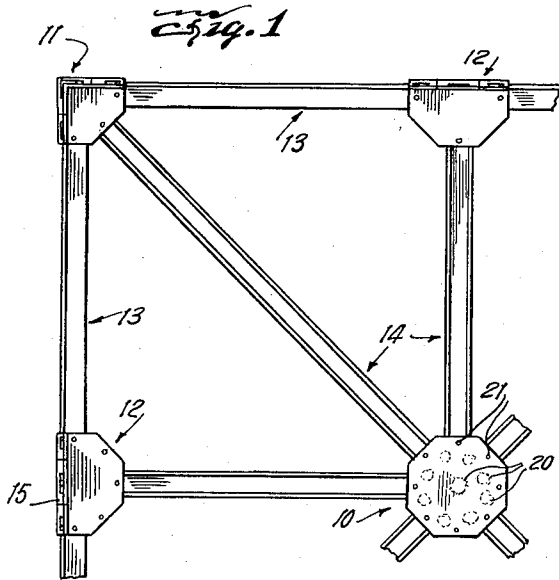
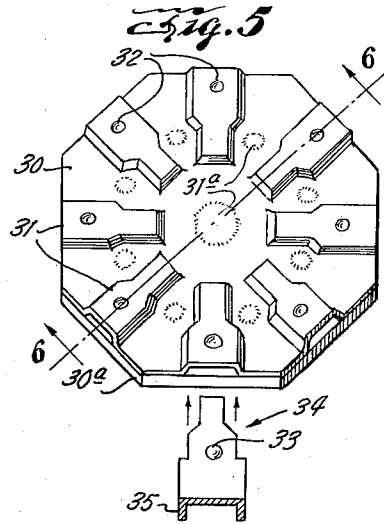
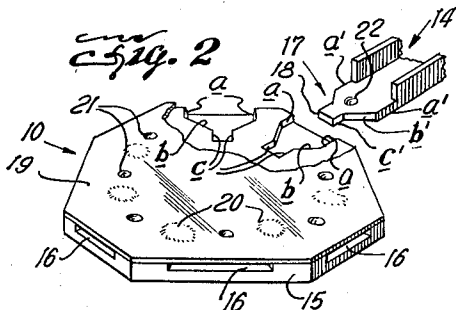
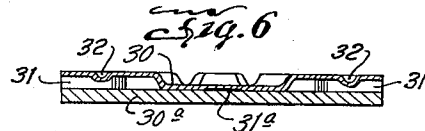


Fig. 3

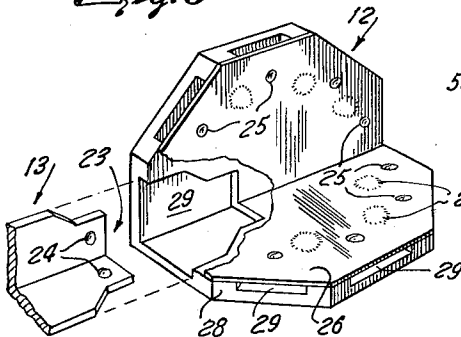


Fig. 7

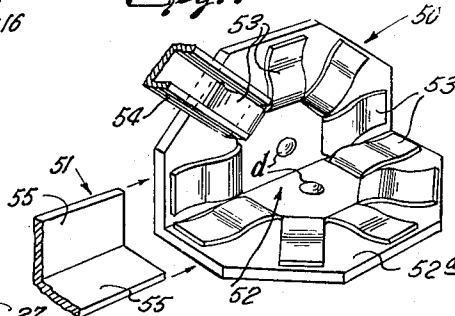
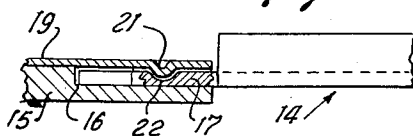


Fig. 4



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CONSTRUCTIONAL TOY

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Application February 27, 1956, Serial No. 567,912

5 Claims. (Cl. 46—29)

This invention relates to constructional toys and more particularly to improvements in the means by which the elements of a construction set are joined together.

The principal object of the invention is to obviate the need for nuts, bolts, screws and other loose fastening devices for the parts of a constructional toy and replace these easily lost or misplaced fasteners by simulated beams, girders, gussets and the like, designed with matching dimples in the ends of the beams and in sockets in the gussets receiving the shaped ends of the beams, holding the elements of a frame-work fabricated from the constructional toy in rigid relationship.

Another object of the invention is to provide a constructional toy in which the ends of the beams and the sockets in the gussets receiving the same are conformably shaped in such manner as to preclude oscillation or rotation about the cooperative dimples jointly formed in these members or, in other words, to prevent other than longitudinal displacement of the beams once in place in their respective sockets in the gussets.

Other objects will become manifest as the description proceeds when considered with the accompanying drawing:

Fig. 1 is a fragmentary elevational view of any arbitrary structure showing the relationship of parts in assembly.

Fig. 2 is a perspective view of a center gusset constructed according to the invention.

Fig. 3 is a perspective view of a corner gusset, showing a beam end about to be inserted in a socket of the gusset.

Fig. 4 is a detail view of a gusset and beam fragmentarily shown in interlocked relationship.

Fig. 5 is a perspective view of a slightly modified form of the gusset and showing a beam end about to be received in one of its sockets.

Fig. 6 is a sectional view taken on line 6—6 of Fig. 5 and

Fig. 7 is a further modified form of gusset showing a beam end about to be fastened thereto.

Continuing with a more detailed description of the drawing, reference is primarily made to Figs. 1 to 4 inclusive, wherein numeral 10 denotes generally a center gusset, numeral 11, a corner gusset, and numeral 12, an angle gusset. Numeral 13 generally refers to angle beams, while numeral 14 denotes generally the channel beams which may also be referred to in the specification and claims as elongate connecting members or elements.

The several gussets shown in Figs. 1 to 4 differ only in shape and adaptation. The center gusset 10 consists of a plate 15 which is die-cast or otherwise formed to define recesses 16 which, as apparent in Fig. 2, have parallel sides $a-a$ nearest the perimeter of the preferably polygonal gusset 10 which converge at $b-b$ into more closely spaced parallel sides $c-c$. The sides $a-a$ match the edges $a'-a'$ of the end 17 of a beam 14 which converges at $b'-b'$ to match the convergent portions $b-b$ of the socket or recess 16. The tip 18 of the end

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17 of the beam 14 has straight parallel sides $c'-c'$ to match the parallel sides $c-c$ of the recess 16.

A cover plate 19 overlies the recesses 16 in the plate 15 and is affixed thereto as by spot welding at 20. The cover plate 19 is formed with a depression or concave-convex dimple 21 which registers with the center of each recess 16 midway between the sides $a-a$. These dimples match with like dimples 22 formed in the end 17 of each beam 14 and are recessed therein when the end 17 is thrust into a recess 16.

From the foregoing it is apparent that the end 17 of the beam 14 is supported against lateral displacement or rotative movement about the dimples 21—22 by the parallel sides $a-a$ and $c-c$ of the sockets 16, the convergent sides $b-b$ serving to guide the tip 18 of the beam into the reduced portion of the socket defined by the sides $c-c$ thereof.

The beams or girders 14 are held in position in the corner gussets 11 and angle gussets 12 in identically the same manner as described for the holding relationship between the beams and gussets 10, hence the description will not be repeated. However, while there is close similarity between the manner of attaching the beams 14 and gussets 10, and that used for attaching the angle beams 13 and corner and angle gussets 11 and 12, it is noted in Fig. 3 that the end 23 of a corner or angle beam 13 is right-angular to conform to the right-angular shape of an angle gusset 12. This is true also of the relationship between the beams 13 and the corner gussets 11. The angles of the ends 23 of the beams 13 have dimples 24 which match dimples 25 in the corner plate 26 which is spot welded as at 27 to a thicker base plate 28 in which is formed the several radial sockets or recesses 29.

In Figs. 5 and 6, is shown another form of gusset plate, the sole difference being that the thin plate 30 is preformed with sockets 31 having dimples 32 which match with like dimples 33 in the end 34 of a beam or girder 35. The end 34 of the beam is shaped to correspond with the sockets 31 in a manner identical to the beam ends and sockets above described and shown in Figs. 1 to 4 and is recessed between the plate 30 and the base plate 30a to which the plate 30 is secured as by welding at 31a.

A further modification of the invention is shown in Fig. 7 wherein an angle gusset 50 is revealed for purposes of illustration, it being understood that corner gussets and center gussets have identical means thereon for holding the beams 51 securely in relation to the gussets. The particular means shown in Fig. 6 for this purpose consists of a spider 52 of spring steel secured by welding or by rivets d to a base plate 52a, and having a series of legs or tongues 53, one in register with each side of the polygonal plate 50 to receive an end of a channel shaped beam 54 and hold the same firmly against other than longitudinal displacement, the spring tongues 53 being substantially equal in width to the space between the side flanges of the channel shaped beams 54.

The corner or angle beams 51 are held by downward pressure on their flanges 55 against the base plate 52a by the spring tongues carried by the angles of the gusset 50.

Manifestly, the construction as shown and described is capable of some modification and such modification as may be construed to fall within the scope and meaning of the appended claims is also considered to be within the spirit and intent of the invention.

What is claimed is:

1. In a construction toy, the combination of a plurality of elongated elements, channel shaped in transverse section, having substantially flat tongues extending longitudinally beyond the adjacent ends of their side flanges,

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and a connecting element comprising a pair of substantially flat, polygonal plates secured by spot welding in juxtaposed relation to each other, one of the plates being comparatively rigid and the opposite plate being relatively thin and characterized by its resilience, one of the plates having a plurality of depressions therein facing the opposite plate, the depressions forming sockets extending inwardly from the sides of the plates, the tongues of the elongated elements being selectively receivable in the sockets and conforming to the shape thereof, the thin, resilient plate having a plurality of concave-convex dimples therein opposite the respective sockets and the tongues of the elongated elements having corresponding dimples therein, the dimples of the plate being adapted to yieldably and frictionally engage the dimples of the tongues to secure the tongues against longitudinal displacement relative to the sockets.

2. The structure of claim 1, the depressions being formed in the rigid plate.

3. The structure of claim 1, the depressions being formed in the thin, resilient plate.

4. The structure of claim 1, the sockets being perpendicular to the respective sides of the plates and each having an open ended outer portion with parallel sides,

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a narrower inner portion with parallel sides, and an intermediate portion whose sides converge from the outer to the inner portions of the socket.

5. The structure of claim 1, the opposed plates comprising the connecting element being folded substantially at right angles along a median line bisecting two opposite sides of the plates, the sockets communicating with said opposite sides being right angular in transverse section, and a plurality of elongated elements, right angular in transverse section, having end portions selectively receivable in the right angular sockets and conforming to the shape thereof.

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