

Oct. 12, 1937.

F. V. HEEDE

2,095,700

STRUCTURAL TOY

Filed July 2, 1936

2 Sheets-Sheet 1

Fig. 1

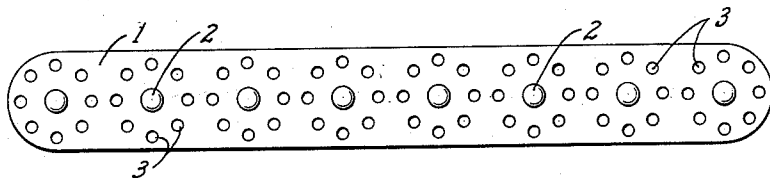


Fig. 2



Fig. 3

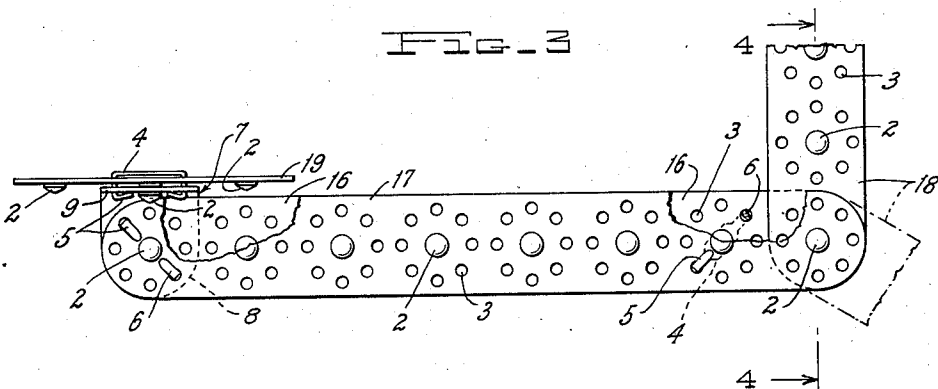


Fig. 4

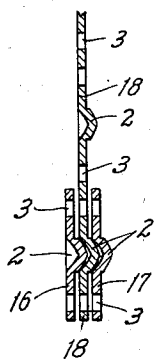


Fig. 5

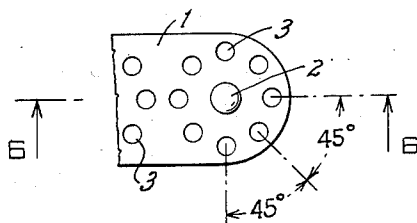


Fig. 6



Fig. 7

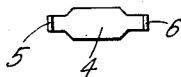
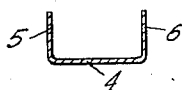


Fig. 8



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Fig. 9

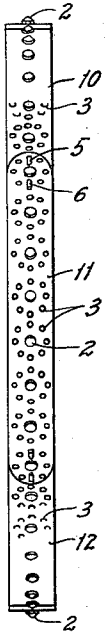


Fig. 10

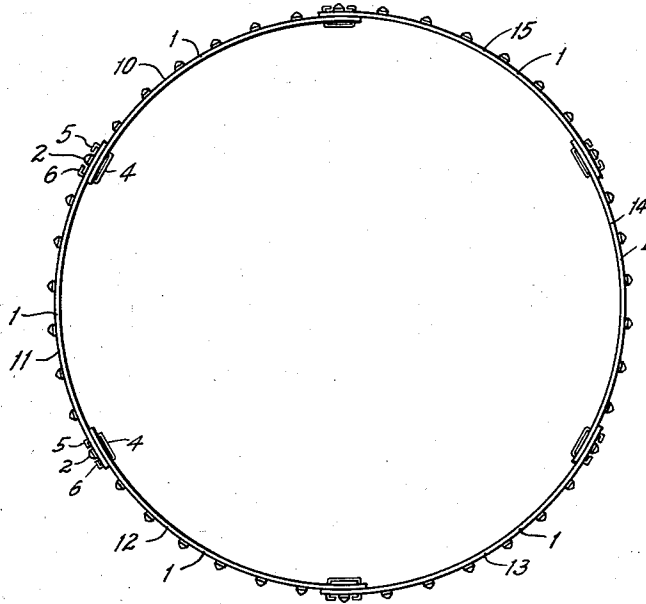


Fig. 11

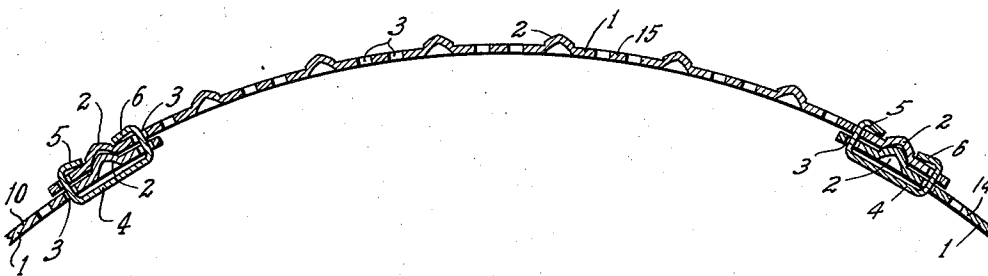


Fig. 12

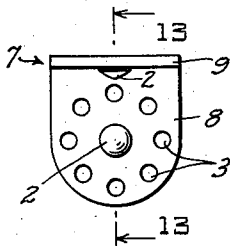
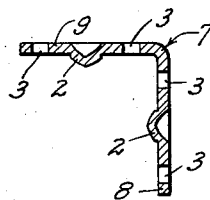


Fig. 13



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UNITED STATES PATENT OFFICE

2,095,700

STRUCTURAL TOY

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Application July 2, 1936, Serial No. 88,577

3 Claims. (Cl. 46—29)

My invention pertains in general to toy structures and specifically relates to a form of structural toy composed of individual assembly units.

One of the objects of my invention consists in providing a structural toy of units of metal strips which may be assembled in various shapes and forms.

Another object comprises providing a structural toy of flexible metal strips which are perforated to permit of the assembly of a plurality of the strips at selected points and angles.

A further object of the invention consists in providing a structural toy assembly system employing clips for insertion in perforated strips for joining the same in various constructions.

These and other objects will be apparent from the following, reference being had to the accompanying drawings in which like reference numerals designate corresponding parts and in which:—

Fig. 1 is a top plan view of a metal strip element employed in accordance with one embodiment of the invention;

Fig. 2 is an edge view of the representation of Fig. 1;

Fig. 3 is a view illustrating the method of assembling the various elements to build the structural toy according to the invention;

Fig. 4 is an enlarged sectional view taken along the line 4—4 of the representation in Fig. 3;

Fig. 5 is an enlarged plan view of an end of the element in Fig. 1;

Fig. 6 is a sectional view of the representation of Fig. 5 taken along the line 6—6;

Fig. 7 is a view of one of the clips used to assemble the various structural elements;

Fig. 8 is a longitudinal sectional view of the clip, Fig. 7;

Fig. 9 is a front view of a circular structure which may be formed in accordance with the invention;

Fig. 10 is an elevational view of the representation of Fig. 9;

Fig. 11 is a fragmentary enlarged sectional view showing the assembly arrangement of the structure of Figs. 9 and 10;

Fig. 12 is a plan view of a metal angle bracket element used in assembling parts of the structural toy; and

Fig. 13 is a sectional view taken along the line 13—13 of Fig. 12.

The invention contemplates the provision of a structural toy composed of thin metal units of various shapes and forms together with clips for joining these units together to produce various structures. Such units are provided with a se-

ries of indentations and accompanying perforations. The indentations are formed so that an indentation extrusion on one side of a unit will mesh with the indentation of another unit to provide an assembly joint between the units. In accordance with the invention, clips are inserted through the perforations adjacent the meshed indentations to secure the joint. This clip assembly method obviates the use of bolts and nuts and permits of an easy and rapid construction of forms without the use of tools of any kind. These extrusions and indentations, when fitted together, may also form a swivel joint which permits of the rotation of the adjoining elements to produce a movable construction without the use of axles or pinions. The material of which the structural units or elements are composed is of a ductility such as to allow of shaping into circular forms such as arches, wheels and the like while permitting the elements to be again straightened to their original form for other uses.

Referring to the drawings, in Fig. 1 there is provided a flat thin flexible metal strip 1 rounded at the ends, along the length of which is a series of indentations 2 formed by extrusions in the strip 1. These indentations are cup shaped and evenly spaced. Arranged around each of these extrusions in a circle is a series of perforations 3 which are evenly spaced from each other at an angle of 45° as shown in Fig. 5.

When strip elements are to be joined together, the extrusion of one strip is meshed into the extrusion indentation of the second strip and a clip is inserted in adjoining perforations and the ends of this clip turned over to provide a joint. Such a clip may be of the form shown in Figs. 7 and 8 in which the clip 4 is provided with ears 5 and 6 of a ductile nature permitting them to be bent over as required.

Fig. 3 shows the method of joining various elements together to build a structure. One end of a strip element 18, which may be similar to strip element 1, is inserted between the ends of a pair of strip elements 16 and 17. These strips 16 and 17 also are similar to the strip 1 and are joined together by a clip 4. As shown in Fig. 4, the indentation of the strip 18 meshes with the indentations of the strips 16 and 17 thereby providing a swivel joint about which the strip 18 can be angularly moved. Thus, the strip 18 corresponds to any angularly moving member of an assembled structure, as, for example, the angularly moving supporting members of a draw bridge. In this form of construction, the use of pivots and axles is eliminated.

Fig. 3 also shows how an angle bracket may be attached to the strips 16 and 17. In this instance, instead of being positioned between the strips 16 and 17, the angle bracket 7 may be mounted at the side of the strip 16 with the extrusion of the bracket 8 meshing in the indentation of the strip 16. As before, a clip 4 may be used to bind the elements together. Another strip, such as strip 19, may then be attached to bracket 7 in the further formation of a toy structure. Fig. 12 shows the details of bracket element 7 with the two flanges 8 and 9 having perforations 3 arranged around the extrusions 2.

The nature of the metal strip elements is such as to permit their deformation in constructing circular figures such as arches and wheels as shown in Figs. 9 and 10. Referring to Figs. 9 and 10, the strip elements 10-15 have their ends overlapping and secured by metal clips 4 inserted in the perforations 3 which surround the extrusions 2 of the strips. As shown, the strips 10-15 form a hoop or wheel. Various equivalent structures may be formed, as desired.

In addition to their assembly functions, the extrusions 2 also strengthen the units and provide a pleasing ornamental appearance. It will be seen that the invention provides a structural toy having simple elements which can be easily and quickly assembled to form various structures of stationary and movable parts without the use of tools of any kind. Although a preferred embodiment of the structural toy has been disclosed, it will be recognized that various changes and equivalent forms can be produced without departing from the scope of the invention. Therefore, no limitations are intended except as pointed out in the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a structural toy, a construction unit comprising a substantially flat strip provided with a series of evenly spaced extrusions, said strip having an annular series of holes provided about each of said extrusions.

2. A structural toy comprising, a plurality of units having flat surfaces with evenly spaced extrusions forming indentations along one side of the units and protuberances along the other side, the protuberances of one unit being adapted to interchangeably fit in the indentations of another unit, said units each having an annular series of openings centered about each of said extrusions, and a unitary clamp adapted to extend through a pair of openings in each of two units joined together to clamp such two units together in any one of several possible angular positions with respect to each other depending upon the angular disposition of the openings in said annular series of openings.

3. In a structural toy, units comprising flat metal strips each having a series of protuberances on one side and indentations on the other side whereby protuberances of one unit can be meshed in the indentation of another unit, each of said units having an annular series of evenly spaced perforations encircling each of said protuberances, and unitary clamping means adapted to extend through the openings of complementary engaged units to hold the same together in selected relative angular position with the protuberance of one unit engaged with the indentation of another.

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