April 16, 1940. M. A. DARNELL 2,197,578

STRUCTURAL TOY

Filed Jan. 6, 1939

Fig. 1.

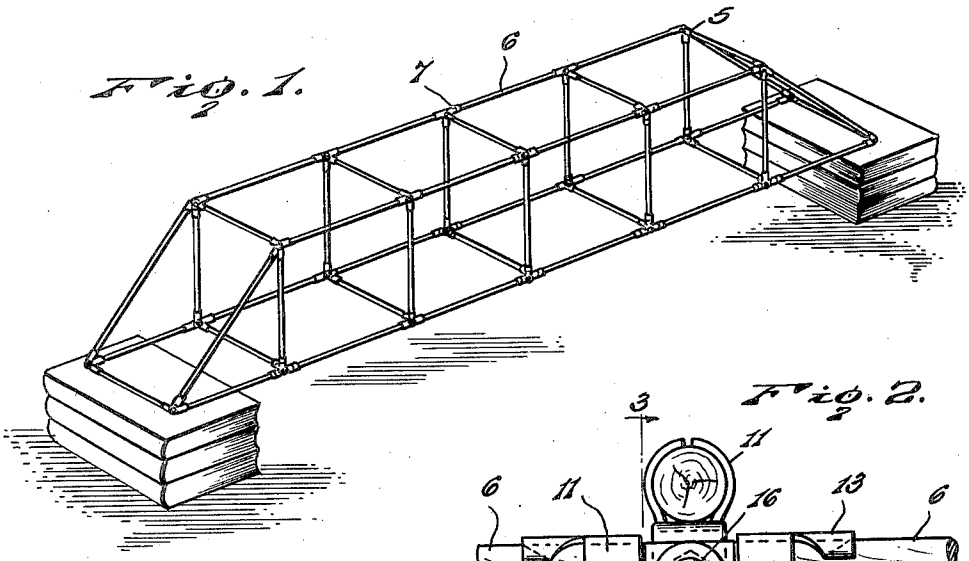


Fig. 2.

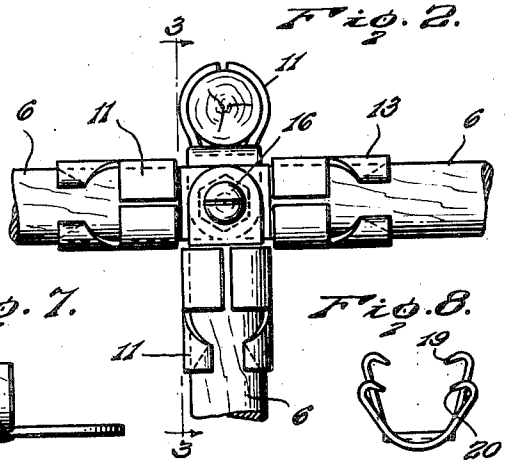


Fig. 4.



Fig. 7.

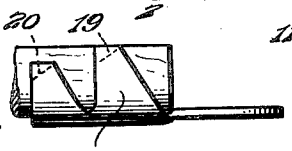


Fig. 8.

Fig. 3.

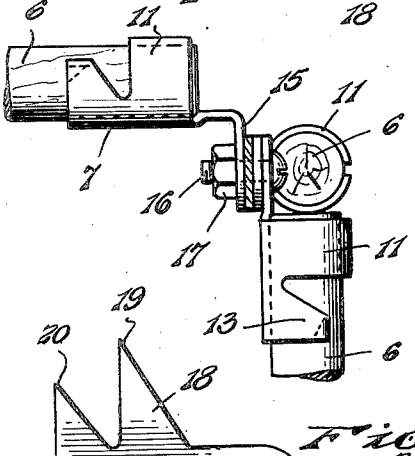


Fig. 5.

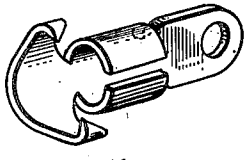


Fig. 6.

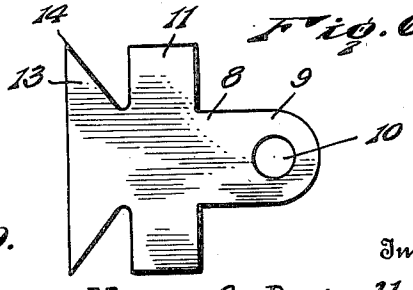
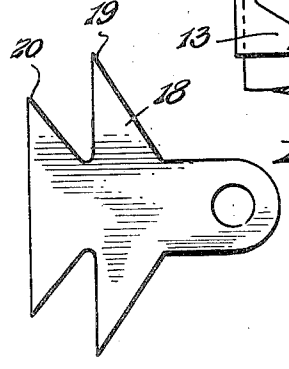


Fig. 9.



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STRUCTURAL TOY

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Application January 6, 1939, Serial No. 249,662

3 Claims. (Cl. 46—29)

This invention relates to toys and more particularly to structural toy building elements and method of assembling the same.

The object of the invention is to provide a series of toy building elements, the individual units of which are so constructed as to permit said units to be easily assembled and united to form a miniature bridge, crane, derrick or other mechanical structures, thus affording a source of entertainment and amusement for children as well as grown-ups and at the same time tending to familiarize a child in the fabrication of various mechanical structures.

A further object of the invention is to provide a novel form of connector for detachably uniting adjacent structural units, each connector being provided at one end thereof with a coupling shank and at its other end with a socket for the reception of a structural unit, there being spaced spurs disposed in advance of said socket and adapted to be driven into said unit for permanently securing the connector in position thereon.

A further object is to form the connector from a single metallic blank so constructed that, when the blank is rolled or pressed into proper shape and fitted on the end of a structural unit, said connector will be permanently retained in position thereon without the employment of nails, screws, rivets or similar fastening devices.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency as well as to reduce the cost of manufacture.

In the accompanying drawing forming a part of this specification and in which similar numerals of reference indicate corresponding parts in all the figures of the drawing:

Figure 1 is a perspective view of a series of structural units embodying the present invention showing the same assembled and united in the form of a bridge,

Figure 2 is an enlarged front elevation of one of the joints shown in Figure 1,

Figure 3 is a vertical sectional view taken on the line 3—3 of Figure 2,

Figure 4 is a front elevation of one of the connectors before the piercing spurs are driven into the wood,

Figure 5 is a perspective view of one of the connectors detached,

Figure 6 is a plan view of the blank from which the connector shown in Figure 5 is constructed,

Figure 7 is a side elevation illustrating a modified form of connector,

Figure 8 is a front elevation of the connector shown in Figure 7 before the piercing spurs are driven into the wood, and

Figure 9 is a plan view of the blank from which the connector shown in Figure 7 is constructed.

The improved structural toy forming the subject-matter of the present invention may be used in the fabrication of bridges, cranes, derricks and various other mechanical structures, and in Figure 1 of the drawing the different elements or units are assembled and united to form a bridge, indicated at 5. The device comprises a plurality of independent structural elements or units 6 of any desired length and each preferably cylindrical in cross section and formed of wood or other suitable material. Fitted on the opposite ends of each structural unit 6 is a connector 7 preferably formed from a single metallic blank of the construction, indicated at 8 in Figure 6 of the drawing. The blank comprises a body portion having one end thereof formed with a laterally extending coupling shank 9 provided with an opening 10 adapted to register with the opening in the coupling shank of a corresponding connector on an adjacent structural unit 6 when two or more of said units are assembled. The blank 8 is further provided with laterally extending ears 11 adapted to be pressed or rolled into substantially cylindrical form to provide a socket 12 adapted to receive the end of the adjacent structural unit 6. That portion of the blank 8 in advance of the ears 11 is cut-away to form inclined spurs 13 terminating in piercing points 14 which, when the blank is pressed into shape, are adapted to be forced or otherwise driven into the wood for the purpose of holding the connector permanently in position on the adjacent structural unit and thus dispense with the employment of nails, screws, rivets and similar fastening devices. The coupling shanks 9 of certain of the connectors 7 are bent laterally to form angular portions 15 so as to permit the structural units constituting the top of the bridge to be connected with the structural units forming the side of the bridge, as best shown in Figure 3 of the drawing. As previously stated, the connectors are each stamped from a single metallic blank, and after the blank is formed the ears 11 and the attaching spurs 13 are bent or pressed into the shape shown in Figure 5 of the drawing, and in which position the piercing points of the spurs will be normally slightly out of alinement with the inner wall of the receiving socket 12, as best shown in Figure 4 of the drawing. By now pressing inwardly on the spurs 13 with a pair of pliers or other suitable tool, said spurs will

enter the wood constituting the body of the adjacent structural unit 6 so as to firmly and permanently hold the connector in position thereon. In uniting adjacent structural units 6, the coupling shanks are overlapped with the openings 10 therein registering with each other, after which a threaded bolt 16 is passed through the registering openings 10 and fitted with a clamping nut 17, thereby firmly and detachably holding adjacent units in assembled position.

In Figures 7 and 8 of the drawing, there is illustrated a modified form of the invention formed from a blank of the construction shown in Figure 9 of the drawing, and in which the socket forming ears 18 are tapered and terminate in piercing spurs 19 adapted to be driven into the wood. In this form of the device, the front attaching spurs 20 are of less length than the rear attaching spurs 19 so that, when the blank is pressed into proper shape and positioned on the end of a structural unit and the spurs 19 and 20 pressed into the wood, the rear spurs 19 will pierce the wood at the top of the unit while the front spurs 20 will pierce the wood at the opposite sides of said unit and thus assist in preventing cracking or splitting of the wood or other material constituting said unit.

It will, of course, be understood that any desired number of structural elements or units may be provided and in certain cases said units may be curved or bowed instead of being straight, but in all cases the ends of the structural units will be provided with connectors either of the construction shown in Figure 5 or 7 of the drawing whichever may be preferred. It will, furthermore, be understood that the devices may be made in different sizes and shapes and painted, plated or otherwise coated to give the assembly a neat attractive appearance.

A building toy constructed in accordance with the present invention will not only afford a source of entertainment and amusement to children and grown-ups but will also tend to familiarize a child with the fabrication of mechanical structures and thus assist in educating the child along mechanical lines.

Having thus described the invention, what is claimed as new is:

1. A device of the class described comprising mating structural units formed of fibrous material, and connectors permanently secured to the opposite ends of said units and each provided at one end thereof with a perforated coupling shank adapted to register with a mating shank and having its other end provided with a split socket for the reception of an adjacent structural unit, portions of the opposite sides of the socket being cut away to form oppositely disposed spurs of less length than the height of the socket and terminating in piercing points adapted to be driven into the adjacent sides of said unit in spaced relation to the split portion of the socket, and fastening devices extending through the perforations in the registering coupling shanks for detachably securing the units together.

2. A connector for structural units formed from a single metallic blank having one end thereof provided with a perforated coupling shank and its intermediate portion formed with laterally extended ears spaced apart to form a split socket, the metal between the ears and the front edge of the blank being cut-away to form tapered attaching spurs terminating in piercing points spaced from and disposed on opposite sides of said split socket.

3. A connector for structural units stamped from a single metallic blank having one end thereof reduced to form a flat longitudinally disposed coupling shank provided with an opening and its other end formed with tapered spurs terminating in inwardly extending piercing points, the intermediate portion of the blank being provided with laterally extending ears adapted to be pressed into substantially cylindrical form to provide a split receiving socket, the piercing points of the spurs being normally offset with respect to the outer wall of the split socket.

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