Dec. 9, 1930. L. M. PARKER 1,784,107

DEMOUNTABLE STRUCTURE

Filed July 5, 1928

Fig. 1.

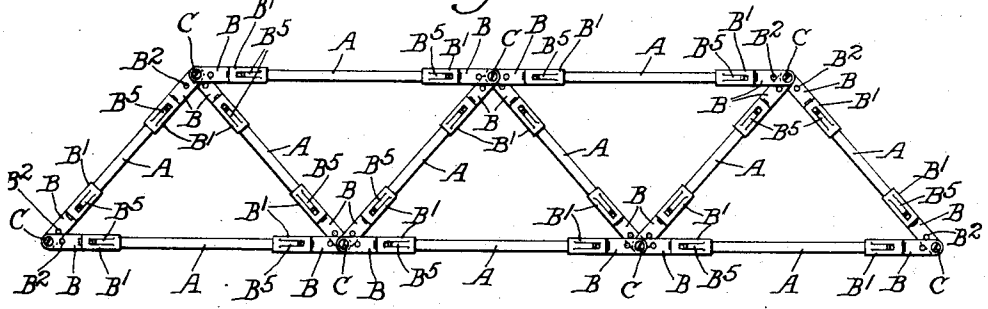


Fig. 2.

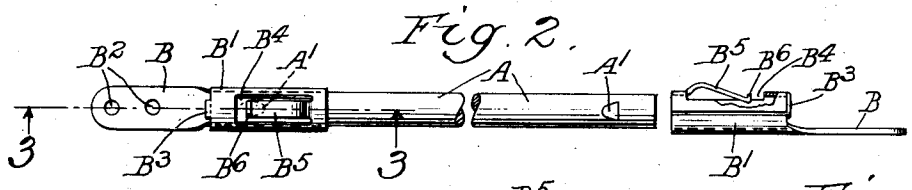


Fig. 3.

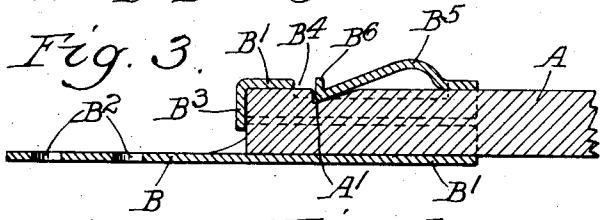


Fig. 4.

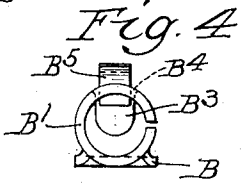


Fig. 5.

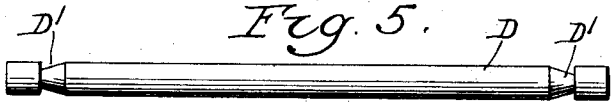
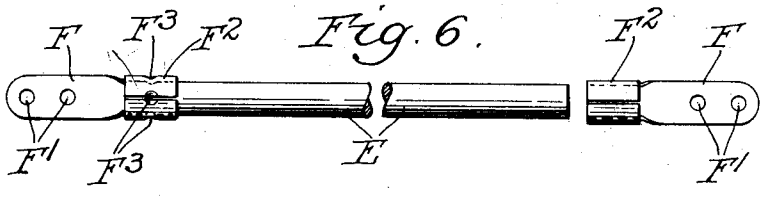


Fig. 6.



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UNITED STATES PATENT OFFICE

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DEMOUNTABLE STRUCTURE

Application filed July 5, 1928. Serial No. 290,489.

This invention relates to demountable structures of the type adapted for use as toys and as full-scale demountable structures. The form illustrated herewith is particularly adapted to use as a structural toy, but it is not limited to that use. One object of the invention is to provide means whereby an end or union piece may be slipped into a longitudinal piece to be removably attached to it without the use of nails or other projections from the longitudinal piece. Another object is to provide in such a union piece a construction whereby it may be slipped directly onto the longitudinal piece and whereby it will thereupon become automatically fastened to such piece. Other objects will appear from time to time in the course of the specification and claims.

I illustrate my invention more or less diagrammatically in the accompanying drawings wherein:

Figure 1 is a side elevation of a portion of a structure made according to my invention;

Figure 2 is a side elevation showing on an enlarged scale one of the composite members of which the structure is built;

Figure 3 is a longitudinal cross section on a further enlarged scale showing one of the union pieces in position on a longitudinal piece, the section being made at 3—3 of Fig. 2;

Figure 4 is an end view of one of the union pieces;

Figure 5 is a modified longitudinal piece;

Figure 6 is a further modification.

Like parts are designated by like characters throughout the specification and drawings.

A represents one of the longitudinal members. It may be made of wood, fiber, metal or any suitable material. As shown herewith it is of wood. It is provided adjacent each end with a notch A^1.

B is a union piece and is provided with a generally flat portion as shown, and a generally cylindrical portion B^1. The flat portion may have two or more perforations B^2. B^3 is a stop extending across a portion of the opening through the cylindrical portion B^1. B^4 is a cut-away portion in the cylindrical portion B^1. B^5 is a spring tongue downwardly bent and lying in the cut-way portion B^4. B^6 is the upwardly bent end of the spring tongue B^5.

C, C are screws or bolts, preferably the latter. They are used in removably attaching a plurality of the union pieces to form a structure such as that shown in Figure 1.

D is a modified form of longitudinal member. It is provided with a groove D^1 adjacent each end. The groove as shown is of greatest depth nearest the end of the member. This is not an essential arrangement and any groove or depression might be used. As shown in Figures 1 to 4 inclusive the union member is readily removable from the longitudinal member. When the longitudinal member is of the form shown in Figure 5, the union member is not readily removable.

In Figure 6 there is shown a further modification in which a longitudinal member E is used. This member has no preformed notches, grooves or depressions in it. A modified union member F is used. It has a flat portion as shown, in which one or more perforations F^1 are made. F^2 is a generally cylindrical portion. The member is essentially made as at the right end of Figure 6. It is slipped into one end of one of the longitudinal members and then by means of a punch or any other suitable tool depressions F^3 are formed. These depressions distort the cylindrical portion F^2 and force portions of it into the material of the longitudinal member E, thus making a relatively permanent union between the end members and the longitudinal members.

It will be obvious that while I have shown an operative device, many changes might be made in the size, shape, relation, distribution and proportion of parts without departing materially from the spirit of my invention, and I wish therefore, that my showing be considered as in a large measure diagrammatic.

The use and operation of my invention are as follows:

When a structure is to be made, a plurality of longitudinal members in the form shown in Figures 1 to 4 is made and a plurality of union members is also made. Given then a plurality of longitudinal members and

a plurality of union members, one of the union members is slipped on each end of the longitudinal members. The longitudinal member is slipped through the cylindrical portion of the union member. As it is slipped on it contacts the downwardly bent spring member B^5. This member is forced upwardly until the notch A^1 comes under it. It then springs into the notch. At about this time the end of the longitudinal member strikes the downwardly bent stop B^3. This stop holds it against further movement through the cylindrical portion of the union member and the spring B^5 with its upwardly bent end B^6 fitting into the notch A^1 prevents removal from the cylindrical portion of the union member. The parts are thus held against accidental separation.

When it is desired to remove the union members from the longitudinal members, it is necessary only to twist the two relative to each other through about 90°. The free end of the spring arm B^5 thus rides out of the notch A^1 and on to a smooth portion of the longitudinal member which may then be withdrawn.

When a number of the composite members have been formed,—that is to say, members formed of the longitudinal members and two of the union members, one at each end, they may thereafter be treated as a unit and from these units a structure such as that shown in Figure 1 is built up.

For certain purposes it is desirable to form a composite building member made up of a longitudinal portion and the two end portions in which these end portions are not readily removable. For that purpose the same union member is used, but the modified longitudinal member of Figure 5 is used. The method of insertion of the end of the longitudinal member into the union member is the same as that described above, but since the groove D^1 extends entirely about the member D, rotation of that member with relation to the union member does not permit a separation of the parts and they are thus, to all intents and purposes, permanently fastened together. When it is desired to separate them, the member B^5 is pried upwardly or otherwise positively raised until it clears the end of the longitudinal member and the latter may then be withdrawn from the cylindrical portion of the union member.

In Figure 6 the parts are initially as shown at the right of that figure. The union members are slipped on the end of the longitudinal member. The cylindrical portion of the union member is then distorted by a prick punch or otherwise, so as to engage the end of the longitudinal member permanently. After this distortion has taken place, the union members cannot be removed from the longitudinal member.

I claim:

1. In combination a composite building member formed of a longitudinal member having notches adjacent its ends and a pair of union members provided with hollow portions adapted to receive an end of said longitudinal member, said union member having an engaging element adapted, in one relative rotational position to be fitted into one of said notches.

2. In combination a demountable, composite building member formed of a longitudinal member having notches adjacent its ends and a pair of union members provided with hollow portions adapted to receive an end of said longitudinal member, said union member having a spring element adapted, in one relative rotational position, to be sprung into one of said notches.

3. In combination, a composite structural member formed of a plurality of separable parts, including a longitudinal member and a pair of union members, one removably attached at each end, said union members formed with receiving parts adapted to receive an end of said longitudinal member, said receiving parts provided with spring engaging members, the ends of said longitudinal member formed to be engaged by said engaging member in one relative rotational position to prevent separation of the parts, and formed to permit separation of the parts when the same are in another relatively rotational position.

4. In combination in a structure, a plurality of removably attached composite structural members, each formed of a plurality of separable parts, including a longitudinal member and a pair of union members, one removably attached at each end, said union members formed with receiving parts adapted to receive an end of said longitudinal member, said receiving parts provided with spring engaging members, the ends of said longitudinal member formed to be engaged by said engaging member in one relative rotational position to prevent separation of the parts, and formed to permit separation of the parts when the same are in another relatively rotational position.

5. In combination, a composite building member, a plurality of separate and separable members including a central member provided adjacent each end with a depression and a plurality of end members, each provided with a receiving portion adapted to receive an end of said central member and each provided with an engaging member adapted to fit into said depression.

6. In combination, a composite building member, a plurality of separate and separable members including a central member provided adjacent each end with a depression and a plurality of end members, each provided with a receiving portion adapted to receive an end of said central member and each provided

with a spring engaging member adapted to spring into said depression.

7. In combination, a composite structural member formed of a plurality of separable parts, including a central member and a plurality of end members, the end members provided with yielding engaging members, the central member provided adjacent each of its ends throughout a portion of its circumference only with receiving parts adapted in one relative rotational position to receive said engaging members.

Signed at Chicago county of Cook and State of Illinois, this 2nd day of July 1928.

LESLIE M. PARKER.