# United States Patent

**Brumlik**

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[54] **CONSTRUCTION ELEMENT FOR THE ASSEMBLY OF MODELS AND THE LIKE**


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**Related U.S. Application Data**

[63] Continuation-in-part of Ser. No. 836,698, June 26, 1969, Pat. No. 3,554,584.

[52] **U.S. Cl.**.....**46/29,** 35/18 A

[51] **Int. Cl.**.....**A63h 33/10**

[58] **Field of Search**.....46/29, 28, 27; 35/18 A



[56] **References Cited**

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*Attorney*—Edward F. Levy



[57] **ABSTRACT**

A construction element comprises a pair of matable segments interconnected by a flexible strap. The segments join to form the element which has an elongated end adapted to receive and mount a tube and a bulbous end. The strap can be positioned to surround a structural member to retain the element in a selected locus with respect to the structural member.


**10 Claims, 15 Drawing Figures**

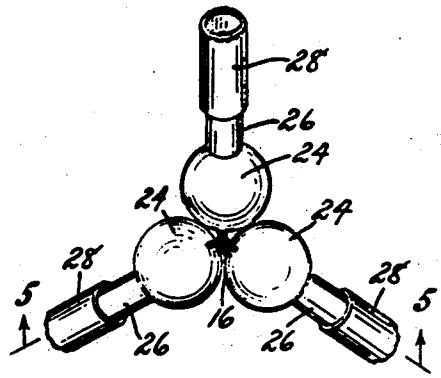
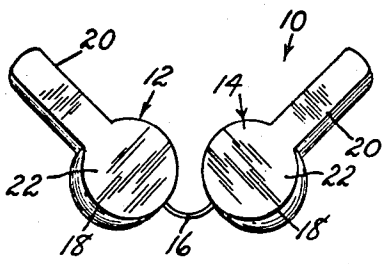


Fig.1



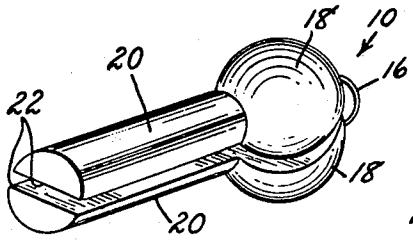
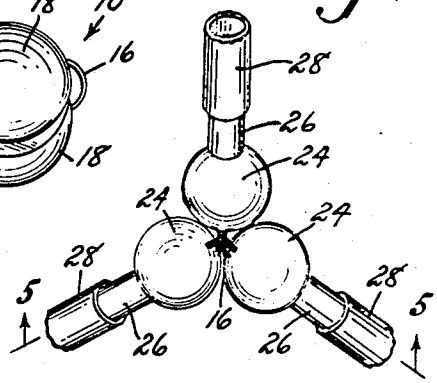




Fig.2

Fig.4



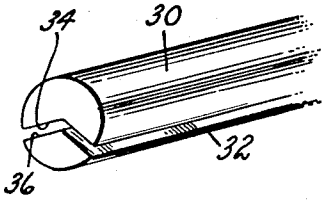




Fig.8

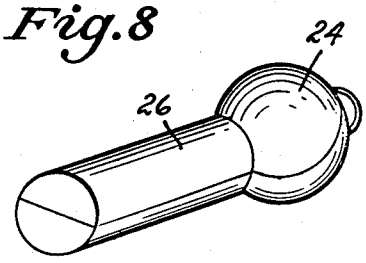



Fig.3

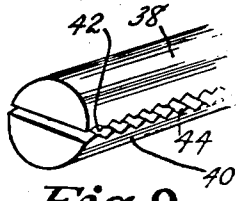



Fig.9

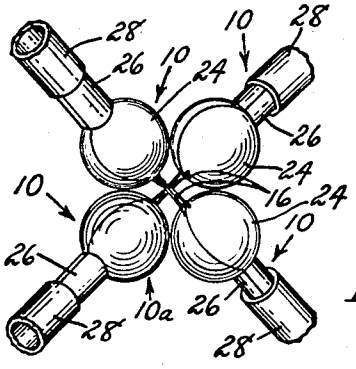



Fig.7

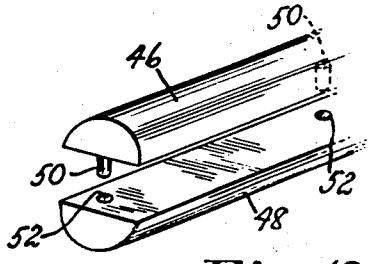
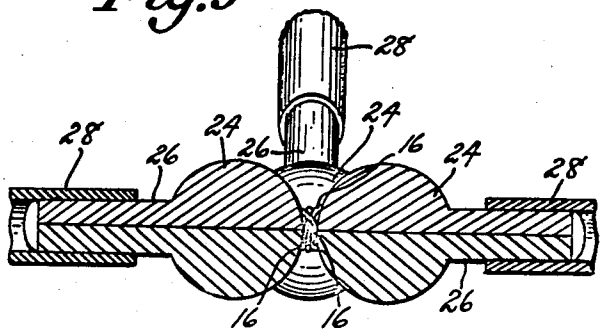



Fig.10

Fig.5



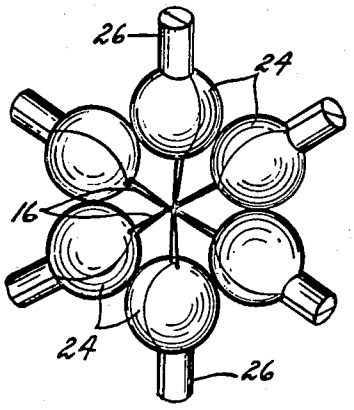




Fig.6

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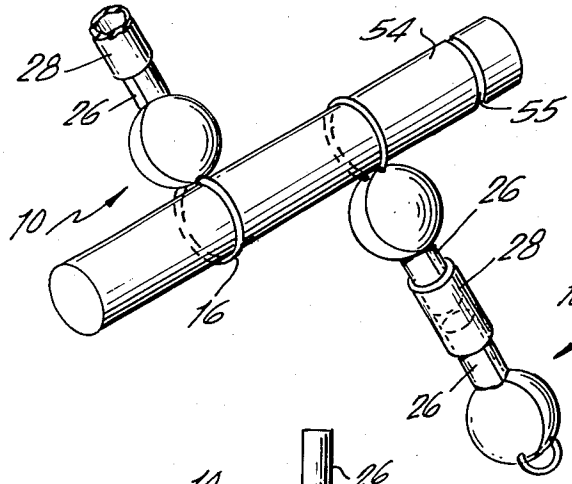



FIG. 11

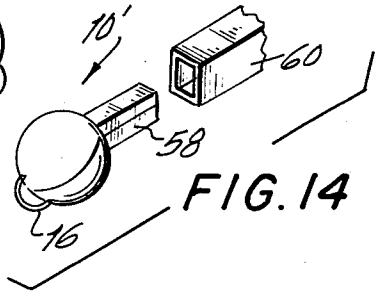



FIG. 14




FIG. 12




FIG. 15

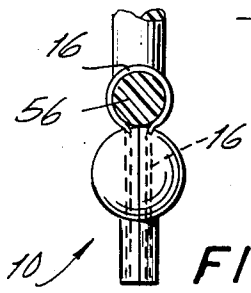



FIG. 13

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# CONSTRUCTION ELEMENT FOR THE ASSEMBLY OF MODELS AND THE LIKE

This is a continuation-in-part of my pending application Ser. No. 836,698, filed June 26, 1969, entitled "-Connector Assemblies for Models and the Like," which will issue as U.S. Pat. No. 3,554,584.

It is an object of the present invention to provide a construction element which can be readily used for the assembly of toys, models and the like alone or in combination with other similar elements.

Another object of the invention is the provision of a construction element of the type described which can be assembled to attach to a rod or other structural member and which when so attached is retained in a predetermined position.

Another object of the invention is the provision of a construction element of the type described in which the element is formed of two segments matable by a tube, the mating of the segments being an important and valuable aspect of the assembly of toys, models and the like.

A further object of the invention is the provision of a construction element of the type described which is economically manufactured and which can be joined with other like elements to provide a wide variety of assemblies, thereby diminishing the cost of the entire model, toy or other structure, and at the same time permitting the building of an infinite variety of structures.

In accordance with the invention, there is provided a construction element comprising a pair of matable segments, the element when the segments thereof are joined forming an elongated end adapted to receive and mount a tube, and an enlarged or bulbous end. The elongated end is integral with the enlarged end. A flexible strap interconnects the enlarged end portions of the segments to form a loop, which enables the element to be connected to a structural member.

Additional objects and advantages of the invention will become apparent during the course of the following specification when taken in connection with the accompanying drawings, in which:

FIG. 1 is a plan view of a construction element made in accordance with the invention and consisting of a pair of segments joined by a flexible strap, and shown in separated condition;

FIG. 2 is a perspective view of the construction element of FIG. 1 with the segments shown about to be assembled;

FIG. 3 is a perspective view of the construction element of FIGS. 1 and 2, shown in assembled condition;

FIG. 4 is a plan view of an assembly of three of the construction elements shown in FIGS. 1—3;

FIG. 5 is an enlarged section taken along line 5—5 of FIG. 4;

FIG. 6 is a plan view of three construction elements with their segments shown in separated condition and arranged to be assembled into the form shown in FIG 4;

FIG. 7 is a plan view of another structure formed by an assembly of a group of four construction elements of the type shown in FIGS. 1–3;

FIGS. 8–10 are partial perspective views similar to FIG. 2 but showing modified types of construction elements;

FIG. 11 is a plan view of several construction elements of the type shown in FIGS. 1 and 2, engaged to a structural member in the form of a rod;



FIG. 12 is a plan view of several construction elements of the type shown in FIGS. 1 and 2, engaged to a structural member in the form of a ring;

FIG. 13 is a cross-sectional view taken along the line 13—13 of FIG. 12;

FIG. 14 is a plan view of another embodiment of the construction element showing a modification of the elongated end of the element and the tube; and

FIG. 15 is a plan view of still another embodiment of the construction element showing a modification of the bulbous end of the element.

Referring in detail to the drawings, and particularly to FIG. 1, there is shown a construction element 10 made in accordance with the present invention and comprising a pair of complementary segments 12 and 14 joined together by a flexible strap 16. In the form of the invention shown, the element 10 is preferably molded from plastic with the strap 16 formed integrally with the segments 12 and 14. However, the segments 12 and 14 may be made of metal or other suitable material and the strap may be made of wire, cable or cord and joined to the segments in any suitable manner, as by embedding or the like as shown in FIG. 13.

The segments 12 and 14 are of matched construction, each comprising a hemispherical portion 18 and an elongated semi-cylindrical portion 20 extending radially therefrom. The segments 12 and 14 also have matching flat surfaces 22. The strap 16 joins the hemispherical portions 18 at the points thereof diametrically opposed to the semi-cylindrical portions 20. The segments may be fitted together in the manner shown in FIGS. 2 and 3, with their flat surfaces 22 in abutment and cemented together to form the completed construction element 10. In this assembled condition, the matching hemispherical portions 18 form a spherical end 24 and the matching semi-cylindrical portions 20 form an elongated cylindrical end 26. The strap 16 assumes the form of a closed loop, the ends of which are integral with the respective halves of the spherical end 24. The assembled cylindrical end 26 is sized to fit frictionally within and retain an elongated tube 28.

FIGS. 4 and 5 show three construction elements 10 assembled together to form a triangular plan figure. In achieving this figure, the three construction elements 10 in their original split form are placed one upon the other with their straps 16 crossing (see FIG. 6). The segments of the elements are then cemented together to form the three assembled construction elements 10. In assembling the construction elements, the straps 16 are interconnected in the form of loops. FIG. 7 shows four construction elements 10 interconnected in the manner described above to form a tetrahedron assembly.

It has been previously suggested that the segments 12 and 14 of the element 10 may be cemented together. However, if the tube is made to fit tightly, frictionally over the cylindrical end 26 of the assembled construction element 10, the tube 28 will itself hold the assembled element together, without the necessity for cementing. This is advantageous in that the tubes 28 can be removed when desired, and the construction elements 10 can be separated for reuse. A function of the enlarged end 24 is to serve as a stop for the insertion of tube 28.

FIG. 8 shows one form which the elongated portion of construction element 10 may take if the tubes 28 alone are to be used to hold together the assembled construction elements. The segments 30 and 32 of the cylindrical elongated end are formed with confronting wedge-shaped faces 34 and 36 which interfit when the segments are brought together and ensheathed by a tube 28. The wedge-shaped surfaces 34 and 26 prevent lateral relative movement of the interfitting segments 30 and 32.

FIG. 9 shows another form which the cylindrical elongated end of the construction element 10 may take. In this view, the segments 38 and 40 are formed with serrated confronting faces 42 and 44, which intermesh to prevent longitudinal relative movement of the segments 38 and 40.

FIG. 10 shows segments 46 and 48, the confronting surfaces of which are respectively formed with pins 50 and bores 52 which receive the pins 50 to prevent both lateral and longitudinal movement of the segments 46 and 48 when the latter are assembled.

The connecting straps 16 may be made of rubber or other elastomeric or stretchable material, or may be in in the form of a spring. When the straps 16 are made stretchable as well as flexible, they will apply tension to any member about which they are placed, thereby tending to hold the construction element stationary with respect to such member.

The construction elements 10 may also be utilized in the building of architectural models, toy structures or the like, and for this purpose provide an extremely rapid, convenient and easy method of joining the structural elements thereof. To this end an, assembly kit featuring such construction elements may include, as shown in FIG. 11, an elongated structural member such as a rod 54. The user can then engage a construction element 10 to the rod 54 by splitting the element 10, passing the segments 20 thereof about the rod 54 so that the strap 16 forms a loop about the rod, then bringing the segments face-to-face and slipping a tube 28 over the segments to assemble the element. The strap 16 may be sized to snugly engage the rod whereby the element will remain stationary with respect to the rod. Even more desirably, the strap 16 may be, as mentioned, elastomeric so that exact sizing of the strap is not required and so that any element 10 can engage rods of varying diameters. As further shown in FIG. 11, once one element 10 is attached to a rod 54, another element 10A can be added to that element, with the elongated ends 26 thereof being connected by a tube 28. The element 10A can be formed into an assembly of such elements as illustrated in FIGS. 4 and 7, and such process of building element on element may continue almost endlessly. The surface of rod 52 may be smooth, or optionally may be formed with circumferential grooves or ridges, indicated at 55 in FIG. 11, sized to receive the straps 16. The grooves 55 serve to mount the construction elements 10 in predetermined locations along the rod and also prevent lateral sliding movement of the elements on the rod. It will be appreciated that the rod 52 may be straight, curvilinear, closed into a loop, or of any other shape.

FIG. 12 shows the engagement of four construction elements to a ring 56, with the elements being spaced arbitrarily equally about the ring and another element 10B added on, in the process of expansion of the structure. It will be appreciated that if the straps 16 of the elements 10 mounted on the ring 56 are made sufficiently long so that they extend loosely about the ring, the elements 10 can be made to rotate about the ring in the manner of a hinge. In this manner, the user can employ the construction elements 10 to construct instant hinges upon linear or curvilinear structural members.

The elongated portions of the elements need not be cylindrical but may have square or other cross sections, as long as they correspond to the cross-sections of the tube to be received thereon. Illustrative of this variation is FIG. 14 wherein another embodiment 10' of the construction element is shown. Therein, the elongated end 58 of the construction element is square in cross section, with each segment making up one half of the elongated end. A tube 60 of square cross section fits over the elongated end. The tube may be preformed to this shape or may be of flexible material and given this shape as it is forced over the cylindrical end. Further, the cylindrical end 26 may be made hollow in tubular form and the tubes 28 may be made solid to fit within these tubular cylindrical portions.

The enlarged ends of the construction elements need not be made spherical. These portions may be made of various other shapes, and even faceted as long as they have a relatively enlarged configuration, larger in cross sectional dimensions than the elongated end to form a "head" for the elongated end. Illustrative of this variation is FIG. 15 wherein another embodiment 10'' of the construction element is shown. Therein the enlarged end 62 has a bulbous configuration in the form of a hemisphere having its planar face 64 situated away from the strap, and with cylindrical end extending from said face.

There is thus provided a construction element which may be utilized to make a practically limitless number of assembled forms and which has particular value in the formation of models, toys and the like.

What is claimed is

1. A construction element for use in the assembly of models, toys or the like, said element comprising a pair of interengaging segments, said segments combining to form an elongated end portion and an enlarged end portion integral with said elongated end portion, a flexible strap connecting said segments at the enlarged portions thereof, and a hollow tube sized for ensheathing the elongated portions of the combined segments.

2. A construction element according to claim 1 in which the enlarged end portion of said element is spherical and the elongated end portion is cylindrical.

3. A construction element according to claim 1 in which the segments and the strap are molded integrally of plastic material.

4. A construction element according to claim 1 in which the flexible strap is embedded in the body of each of said segments.

5. A construction element according to claim 1 in which said flexible strap is a cord.

6. A construction element according to claim 1 in which said flexible strap is a wire cable.

7. A construction element according to claim 1 in which the tube fits frictionally over the elongated portions of the segments and holds said segments together in assembled condition.

8. A construction element according to claim 1 in which the segments have confronting and interfitting surfaces of non-planar complementary shapes to prevent relative movement between the assembled segments.

9. A construction element according to claim 7 in which one of said confronting surfaces has projecting pegs and the other confronting surface has corresponding recesses sized to receive and retain said pegs.

10. A construction element according to claim 1 in which the flexible strap is elastomeric.

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