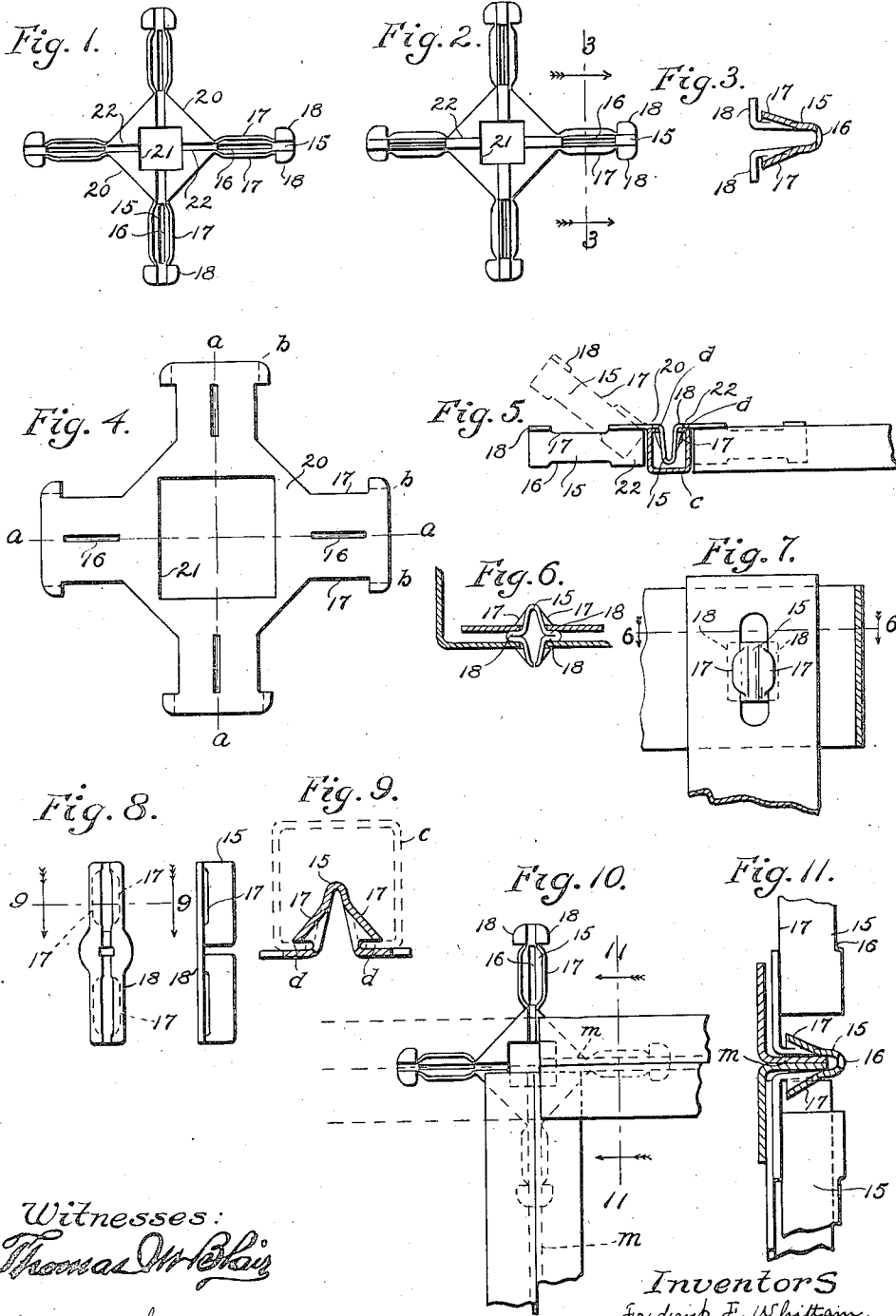


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CONSTRUCTION MEMBER.
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To all whom it may concern:

Be it known that we, FREDERICK F. WHITTAM, of Dorchester, county of Suffolk, and HARRY C. WITT, of Somerville, county of Middlesex, both in the State of Massachusetts, and both citizens of the United States, have invented certain new and useful Improvements in Construction Members, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

This invention relates to improvements in connection members particularly adapted for use to connect two or more elements of a structure whereby a series of said elements can be combined to build structures of a practical, educational or amusing nature.

The object of this invention is to provide a construction member of the general nature herein described adapted for a large variety of uses and constituting practically a universal joint connection which, in one of its simplest embodiments can be utilized to engage a slotted building element or, in its more complex constructions, can be utilized to secure to any suitable building element one or more other building elements to constitute a structure.

Another object of the invention is to so construct a construction member of this nature and having one or more engaging devices for engaging structural elements that said engaging devices may receive other devices or elements additional to the primary structural elements.

Another object of the invention is to so construct construction members of this nature that the connection between the several engaging devices is bendable to dispose the several engaging devices at various angles.

The invention consists in the novel engaging device.

The invention also consists in a series of said engaging devices having a bendable connection.

The invention also consists in such other novel features of construction and combination of parts as shall hereinafter be more fully described and pointed out in the claims.

Figure 1, represents a plan view of a

group of four of the engaging devices united by bendable connections. Fig. 2, represents a reverse view of Fig. 1. Fig. 3, represents an enlarged view of one of the engaging devices taken on line 3—3 Fig. 1. Fig. 4, represents a plan view of a blank adapted to be bent to make the structure shown in Figs. 1 and 2. Fig. 5, illustrates one of the uses of the structure shown in Figs. 1 and 2. Figs. 6 and 7 illustrate a different combination of two of the engaging devices and the use of the same, Fig. 6 being a sectional view taken on line 6—6 Fig. 7. Fig. 8, represents respectively a plan and side view of two of the engagements united by a connection which is preferably bendable. Fig. 9, represents an enlarged sectional view taken on line 9—9 Fig. 8 and reversed, a structural element being indicated in position. Fig. 10, represents a plan view showing one of the uses of the structure shown in Fig. 1. Fig. 11, represents an enlarged sectional view of some of the parts shown in Fig. 10 as taken on line 11—11 of said figure.

Similar characters of reference designate corresponding parts throughout.

In its simplest embodiment this invention consists in an engaging device having the cross sectional shape approximately shown in sectional view in Fig. 3 of the drawings. This engaging device is preferably constructed of sheet metal which is bendable and comprises the channel 15 the bottom of which has the slot 16 and the side walls of which have the outwardly extending edges, ears or engagements 17, 17 and portions of the edges of said channel are bent outward to provide the tongues 18, 18 which are so spaced from the lines of the ears 17, 17 that a part of a structural member may be received in such space and be engaged at one surface by said ears 17, 17 and at the other surface by said tongues 18, 18. Such engagement is approximately illustrated in Figs. 5, 6, 7, and 11 of the drawings as will hereinafter be more fully described, Figs. 10 and 11 illustrating also one of the uses for the channel member 15.

For some purposes the simple engaging device thus described may be engaged with

any structural member having a slot in which the channel member 15 is adapted to be received and said channel member is or may be utilized to receive another or other structural members somewhat similar to those shown at *m, m* in Figs. 10 and 11.

The engagements or engaging devices thus described are, for many uses, combined in various ways some of which are shown in Figs. 1, 2, 6, 7 and 8 of the drawings and the combined engaging devices and their connections are bent up from blanks of sheet metal. For the purpose of illustrating the construction of one group of these engaging devices we have, in Fig. 4, illustrated the blank from which the group shown in Figs. 1, 2, 5, 10 and 11 are made. Said blank, Fig. 4, has the plate or web 20 having a series of radially extending arms which when suitably bent constitute said engaging devices and, hence, are identified by reference characters indicating parts of said devices; and said plate or web 20 preferably has the central opening 21 the shape of which depends somewhat on the shape of the structural member which it is adapted to receive but which is preferably rectangular. Such blank, shown in Fig. 4, is bent on lines *a-a* to provide the channels 22, 22 which communicate with the aligned channels of the channel arms 17, 17 and by such bending the central opening 21 is contracted in dimension while the web or connecting member 20 extends at right angles to said channels 22, 22, and the projections which constitute the tongues 18, 18 are bent on the lines indicated at *b, b* Fig. 4 to make the laterally extending tongues 18, 18 somewhat offset from the edges which ultimately constitute the ears or bearing edges 17, 17 and, after bending such blank portions of the channel members 15, 15, are spread apart to the positions shown approximately in Figs. 1 and 2.

The web 20 is bendable in various directions and the material used for the blank is of tin or of some other suitable nature that will retain its shape when so bent and the member shown in Figs. 1 and 2 is adapted for use in securing together two or more structural elements having slots to receive the engaging devices, one of said elements being indicated, as to cross sectional shape, in Figs. 5 and 9 at *C* and having inturned edges *d, d* between which is a slot through which the channel members 15, 15 may be pushed so that the ears 17, 17 enter through said slot and engage the inner surfaces of said edges *d, d* while the tongues 18, 18 overlap the exterior surfaces of said edges *d, d*.

In Figs. 6, 7 and 8 the engaging devices are shown as connected in pairs. In Figs. 6 and 7 the tongues 18, 18 of the respective engaging devices are integral and the ma-

terial between the end portions of said tongues constitute the uniting web, while in Fig. 8 the engaging devices having the channel members 15, are in alinement and the tongues or lips 18, 18 preferably are longer than those shown in Figs. 1 and 2. In the device shown, Fig. 8, the bendable connection consists of the middle portion of the tongues or lips 18, 18.

One of the important features of this construction member is that the device for engaging the structural element is that a portion of said device is introduceable through a slot in said element, that is such portion of the engaging device may be pushed longitudinally into the slot of said element or said engaging member may be forced between the edges of said slot at any point in the length of said slot as is shown in Fig. 7 for instance the tongues 18, 18 limiting the inward movement of the channel member 15, and the ears 17, 17 being adapted to spread with said channel member when within said structural element, so that if a construction member having four of the engaging devices, as shown in Fig. 1 is used, lateral structural elements may be secured to another structural element at any point in the length of the latter and, when desired, the lateral elements thus secured may extend at different angles limited only by the angles or directions in which the web 20 is bendable.

It is of course evident that the ears 17, 17 may be spread more or less than as shown in the drawings and such spreading may be accomplished with the assistance of a suitable tool after said ears 17, 17 are located within the element *c* if desired. It is also evident that the engaging devices, primarily the parts 17, 17 and 18, 18 and their supporting means may vary considerably from that shown and may include any means for frictionally engaging the edge or edges of a slot.

Having thus described our invention we claim as new and desire to secure by Letters Patent.

1. A construction member comprising a series of attaching devices having tongues for limiting the movement of said devices in the attaching direction and engaging lips spaced from the plane of said tongues and flared outward along their engaging edges.

2. A construction member comprising a pair of channel members united by a bendable element, said channel members having their edges flared outwardly between their ends and having at their ends outwardly extending tongues.

3. A construction member comprising a series of radially extending channel arms connected by a bendable plate, said arms having tongues located in the plane of said plate and the edges of said channel arms

flared outward to constitute engagements located out of the plane of said plate.

4. A construction member comprising a plate having an opening, said plate bent to
5 constitute radial channel arms extending from said opening and having at the outer ends laterally extending tongues, the edges

of said channel arms flared outwardly at points intermediate their ends.

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