

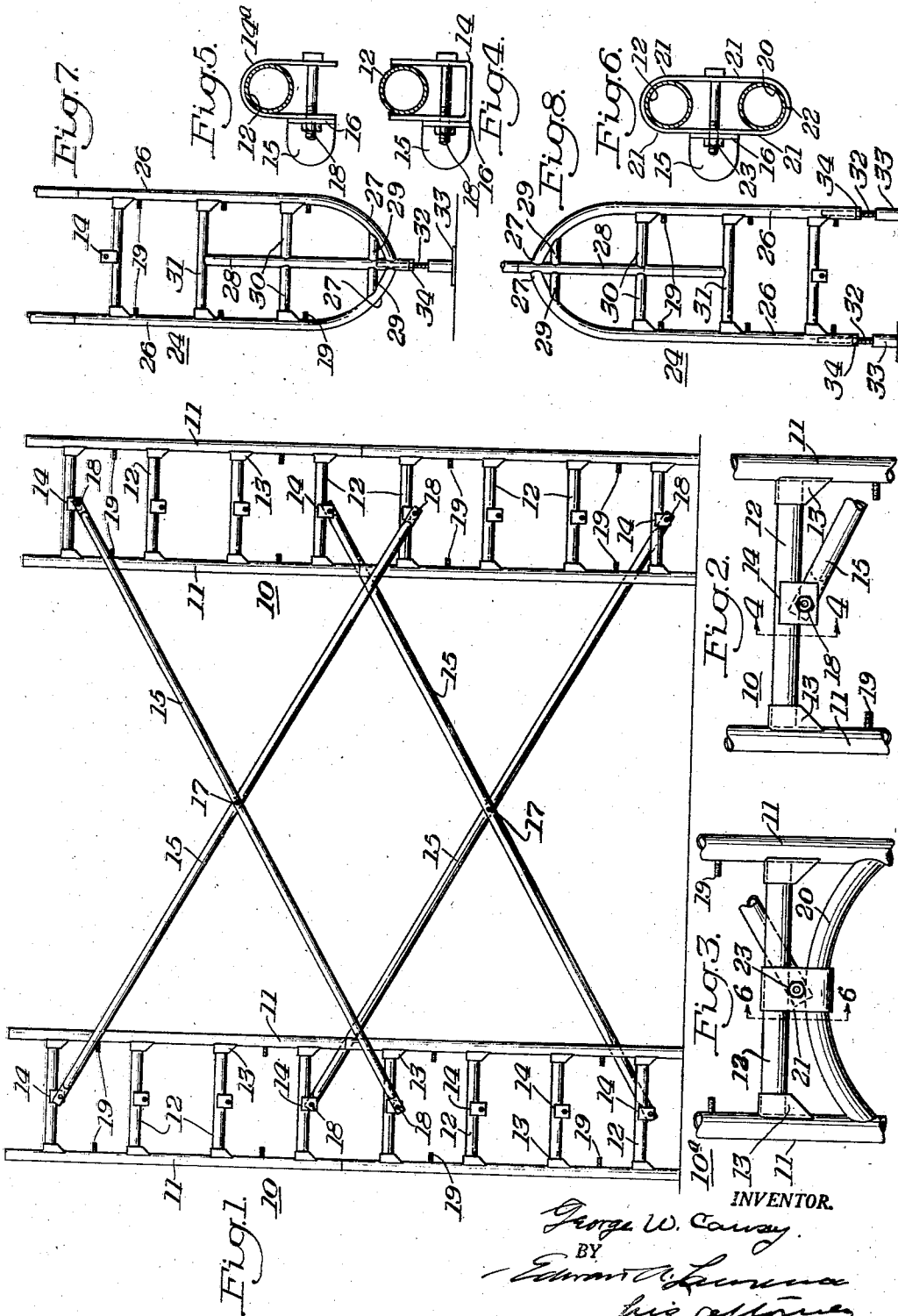
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SCAFFOLD STRUCTURE AND THE LIKE

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SCAFFOLD STRUCTURE AND THE LIKE

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My present invention relates to structural erections which, while they may be used with advantage in the erection of permanent structures, are particularly adapted for use in temporary structures, such as scaffolds and the like, wherein the structural elements are designed for repeated assemblage and disassemblage and therefore must be of relatively light weight for convenient handling while sufficiently strong and rigid when assembled for use.

The structural elements to which my present invention relates are those which are of what may be termed "ladder-like" character comprising a pair of longitudinal members formed of suitable metal and preferably tubular, and said members at spaced intervals are permanently and rigidly connected by cross struts, which also preferably are lengths of metal tubes welded or otherwise permanently attached at their ends to the longitudinal members, the cross struts being of the proper length to hold the longitudinal members permanently in their desired spaced relation.

In the art of scaffolding and the like, such ladder-like elements are employed as the uprights, such as the corner posts or supports of the structure, and cross braces are employed having their opposite ends connected to the longitudinal members of the posts or other supports.

Where two ladder-like posts, positioned opposite each other but in parallel planes, are to be connected by cross braces the ends of the latter are provided with holes which fit over threaded studs extending inwardly from the sides of the longitudinal members of the posts, and nuts are then screwed on the studs to clamp the ends of the braces in place, as is shown in Patent No. 2,201,608, issued to me May 21, 1940.

However that manner of attaching the ends of the interconnecting braces in the case of parallel posts disposed in the same plane is not entirely satisfactory as the studs would be exposed and thus subject to damage in assemblage and disassemblage, and would interfere with safe handling and storage.

One of the principal objects of the present invention is to provide more convenient and satisfactory means for attaching the ends of cross braces connecting parallel ladder-like posts disposed in the same plane, and this object I accomplish by the provision of the novel bracket hereinafter described.

Another object which I have in view is the improvement of ladder-like posts for the purposes above referred to. Such posts, especially in the case of large structures such as scaffolds of great

height, or in the case of scaffolds used for the support of heavy loads such as stone, brick, lumber, or other building material, must be sufficiently strong and rigid to serve the desired purpose and provide the requisite margin of safety.

This object I accomplish by providing in addition to the straight cross struts of the ladder-like posts or supports, an additional cross strut associated with one or more of the straight ones, such additional cross struts being curved longitudinally with their convexity disposed toward the associated straight strut but spaced somewhat therefrom.

To provide means for attaching the ends of cross braces for connecting such posts or supports when disposed in the same plane, I provide a bracket connecting intermediate portions, preferably the centers, of the pair of associated struts, to which bracket the end of the brace or the ends of the braces are bolted.

Another object which I have in view is the provision of a new and improved structural element unit which may be employed either to undersupport a ladder-like post or a series of longitudinally aligned and inter-connected plurality of the same, or to act as a crown element thereof.

Therefore I have invented the structural unit hereinafter described which is designed for the two purposes above referred to.

Other objects and novel features in the construction and arrangement of structural elements and units will appear from the following description.

In the accompanying drawing, wherein I have illustrated practical embodiments of the principles of my invention,

Fig. 1 is an elevation showing two vertically disposed posts or supports, disposed in parallelism and in the same vertical plane, connected together and stayed by means of my improved brackets and cross braces attached thereto;

Fig. 2 is an enlarged detail in elevation showing a portion of one of the posts, illustrating more clearly the bracket and the end of the cross brace bolted thereto.

Fig. 3 is a view similar to Fig. 2 but showing the modified post structure.

Fig. 4 is an enlarged sectional view taken along the dotted line 4—4 in Fig. 2.

Fig. 5 is a view similar to Fig. 4 but showing a modified form of the bracket.

Fig. 6 is a similar sectional view taken along the dotted line 6—6 in Fig. 3.

Fig. 7 is an elevation showing my improved unit element which is arranged to be employed

either as an undersupport for a scaffold post or as a crown element, and in this view is shown as an undersupport;

Fig. 8 is a similar view showing the unit reversed to be used as a crown element.

Referring first to Figs. 1, 2 and 4 of the drawing, 10 indicates two of the ladder-like posts or supports, each comprising the two parallel longitudinal members 11 connected together at intervals by the cross-struts 12. Both the longitudinal members and the cross-struts are preferably formed of tubular metal, the ends of the cross-struts being rigidly secured to the longitudinal members as by welding and by means of the gusset members 13. A plurality of such units are connected together in superimposed relation by the usual pin and socket connections, as shown in Fig. 3 of Patent No. 2,201,608.

Intermediate of the ends of the cross-struts 12, the latter are provided with brackets 14 which, as illustrated in Figs. 1, 2 and 4, are lengths of flat metal bent to form parallel legs connected together and permanently spaced apart by a cross portion or bridge. The free ends of the parallel legs straddle the tubular cross-struts 12 and are permanently attached thereto, as by welding and extend at right angles therefrom, and are provided with registering bolt holes. The bridge portion connecting legs hold the latter in permanent spaced relation.

As shown assembled in Fig. 1, two of the posts 10 are vertically disposed in spaced relation and in the same vertical plane.

15 represents the cross braces which preferably are lengths of metal tubing having their end portions flattened as best shown at 16 in Fig. 4, the flattened ends being provided with bolt holes. These braces are mounted preferably in pairs between the posts 10 in X or crossed relation as shown, and the crossed braces may be connected together at their centers as by bolts 17.

The flattened ends 16 of the cross braces bear in surface engagement with the outer surface of one leg of each of the brackets 14, with the holes in the end of the braces registering with the holes in the bracket, so that the bolt 18 extends through all three holes and the nut is tightened thereon, thus clamping the ends of the cross braces to the posts 10.

Where the cross braces are arranged in X-form, one of the braces is positioned at the rear of the posts and the other at the front thereof so that they will have mutual clearance at their point of intersection.

It is obvious that when the posts are thus cross-connected they will be held rigidly in their positions in spaced relation to each other.

The two assembled and interbraced posts 10, shown in Fig. 1, would form an end or side of a complete scaffold, it being understood, as clearly illustrated and described in my said Patent No. 2,201,608, that additional pairs of posts in a parallel plane are provided to complete a scaffold or a section thereof and the corresponding posts in the two planes are connected by means of similar cross braces whose perforated ends engage the threaded studs 19 welded to longitudinal members 11 of the posts, such studs preferably extending inwardly from the longitudinal members to protect them from damage. Nuts are screwed up on studs against the ends of the cross braces to clamp them in position, as better shown in said patent.

It is obvious that this feature of my present invention provides an assembled structure

which is of improved strength and rigidity and that it may be readily assembled and disassembled, as may be required.

In Fig. 5 I illustrate at 14a a modified form of the bracket formed of a flat strip of metal bent into substantially U-shape to provide parallel spaced apart legs and a central bridge portion of arcuate form to fit about the cross-strut 12 and to be welded or otherwise permanently attached thereto. The parallel legs of the bracket extend at right angles to the cross-strut and are provided with registering holes for the attachment of the flattened end of the brace 15 to the bracket by the bolt 18.

Referring now to Figs. 3 and 6, a modified and reinforced ladder-like post or support structure is therein provided together with a modified form of the bracket.

Thus the post 10a shows the longitudinal members 11 connected by the cross-struts 12 like those shown in Figs. 1, 2 and 4, and also by the arched cross struts 20 whose ends are likewise permanently and rigidly attached to the longitudinal members as by welding.

One of these struts 20 preferably is positioned adjacent to each strut 12 with its convexity in the direction of the latter but spaced somewhat therefrom.

21 represents a bracket formed of a piece of flat metal plate which is bent to engage the outer surfaces of each of the struts 12 and 20 at their centers to span the space between the struts by means of its parallel walls. The ends of the plate are welded together at 22, and the curved extremities of the bracket are welded to the surfaces of the struts which they embrace.

The parallel spaced intermediate walls of the bracket, which span the space between the struts, are provided with registering bolt holes and the flattened end of the cross brace 15 bears against the exterior surface of said intermediate walls, as shown in Fig. 4, and the bolt 23 extends through the bolt hole in the flattened end 16 of the brace 15 and through the registering holes in the bracket 21, and a nut is tightened up on the bolt.

It is obvious that the modified form of ladder-like post or support is of increased strength and rigidity, and is especially useful where considerable burdens are to be supported, and that my improved connection to the posts of the cross braces greatly adds to the rigidity and strength of the assembled scaffold or other structure.

Referring now to Figs. 7 and 8, 24 indicates the unit which may be employed when disposed as in Fig. 7 as an undersupport for a ladder-like post or support, or, when reversed into the position shown in Fig. 8, the unit may be used as a crown member for the post, as for instance for the connection to the latter of a superstructure element, such as a platform, floor or roof structure.

The structure of this unit 24 is somewhat similar in principle to that of the ladder-like posts 10 and 10a, except that at one end, the lower end in Fig. 7 and the upper end in Fig. 8, the longitudinal members 26 are caused to converge as at 27 and are welded to either side of an axial tubular stem 28 which near its outer end is supported from the longitudinal members by the short strut sections 29 welded in place, and again at intervals the strut sections 30 and the strut 31, welded in place to brace the stem 28 in position relative to the longitudinal members 26.

The stem 28 is formed of tubular metal so that

there may be inserted therein the threaded shaft 32 of the footing member 33 and is provided with an extended base to engage the ground. 34 is a nut screwed on said shaft and upon which the lower end of the tubular stem 28 rests. By adjusting the nut 34 on the shaft 32 the elevation of the unit may be easily regulated.

It is evident that when the unit 24 is disposed as shown in Fig. 7, other structural units or elements may be mounted on the unit by pin and socket connection with the upper portion of the longitudinal members 26.

Again, when the unit 24 is reversed into its position shown in Fig. 8 the members 26 may be mounted on the two footing members 33 while superimposed units may be attached to the upper end of the unit 24 for their support by pin and socket connection with the upper end of the stem 28.

I claim:

1. A bracket for connecting up a structural element, such as a vertical support comprising a pair of longitudinal members and cross-struts rigidly connecting said members in spaced relation, two of said cross-struts being adjacent each other and one of said struts being arcuate with its convexity approaching the other strut, said bracket comprising parallel legs connecting arcuate end portions which latter fit about the adjacent struts and are permanently attached thereto as by welding, the parallel legs spanning the space between the adjacent struts and being provided with registering bolt holes for the attachment of another structural element.

2. In scaffolding and the like, a bracket for attaching a cross brace to a support member comprising spaced tubular portions, said bracket formed of plate metal having end bridge portions, arranged to encircle adjacent tubular portions of the support and be permanently fixed thereto

as by welding, and parallel leg portions integral with the bridge portions and connecting the same, the leg portions being provided with registering holes to receive a bolt securing the brace to the bracket.

3. In scaffolding and the like, means for attaching a cross brace to a support member which is formed of spaced parallel longitudinal members connected together at intervals by rigid cross-struts, said brace extending parallel to the plane of said support, said means formed of plate metal and comprising an arcuate intermediate portion encircling one of said cross-struts and permanently attached to the latter as by welding and a pair of straight leg members spaced apart and extending parallel to the plane of the support, said leg members being provided with registering holes to receive a bolt extending through said holes and through a hole in the end of the brace to clamp the latter against an outer surface of one of the leg members.

4. In scaffolding and the like, means for attaching a cross brace to a support member which is formed of spaced parallel longitudinal members connected together at intervals by rigid cross struts, said brace extending parallel to the plane of said support, said means formed of plate metal and comprising a pair of straight parallel leg portions connected at their ends by a bridge portion, said means being permanently attached as by welding to a cross strut of the support and said leg portions being spaced apart and extending parallel to the plane of the support member, said leg portions being provided with registering holes to receive a bolt extending through said holes and through a hole in the end of the brace to clamp the latter to the outer surface of one of the leg portions.

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