Nov. 23, 1965 T. J. JACKSON 3,218,775

COLUMN STRUCTURE ERECTION METHOD

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Fig. 2

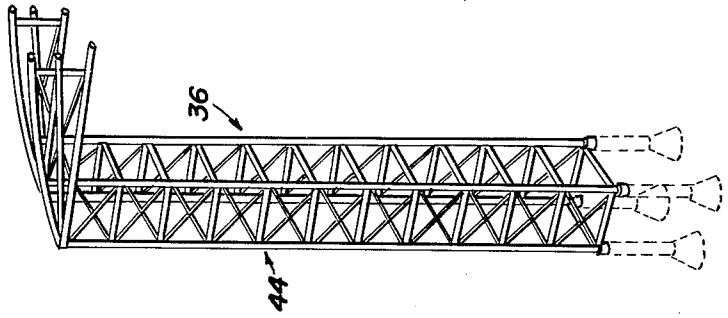
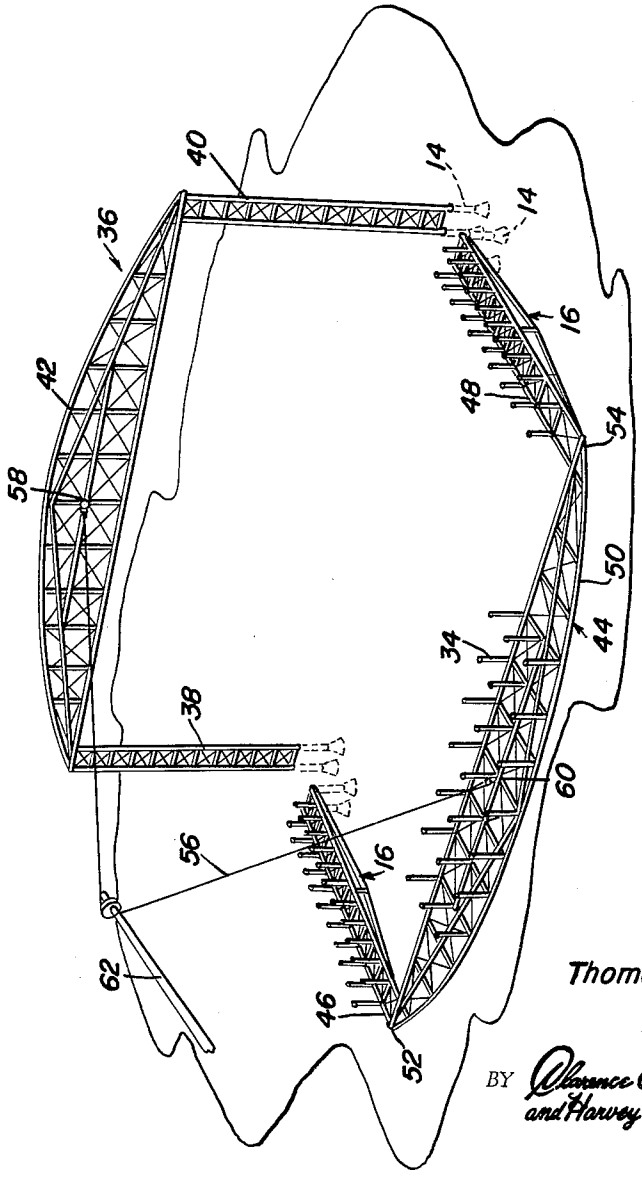


Fig. 1



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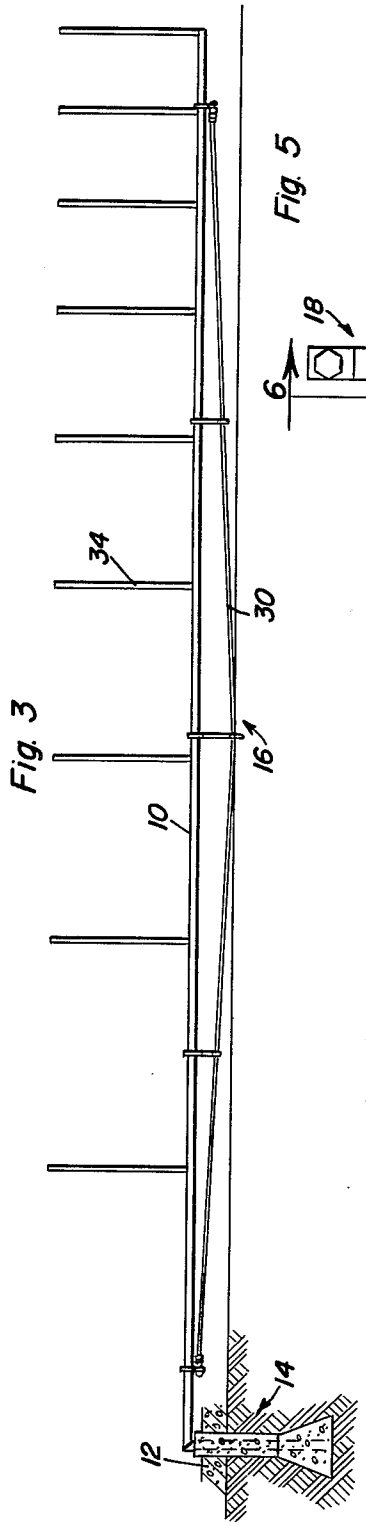


Fig. 3

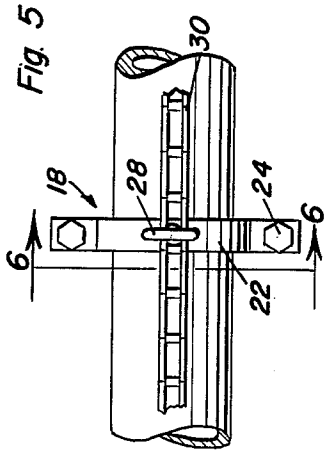


Fig. 5

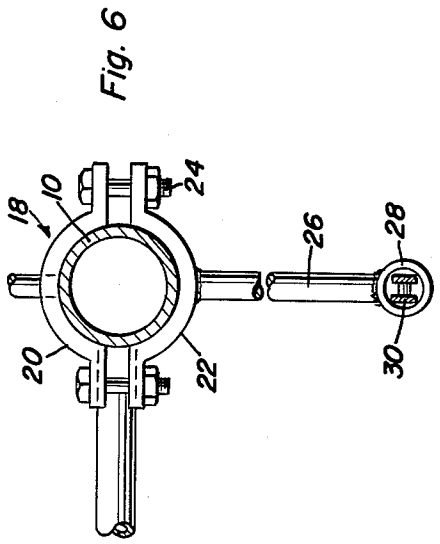


Fig. 6

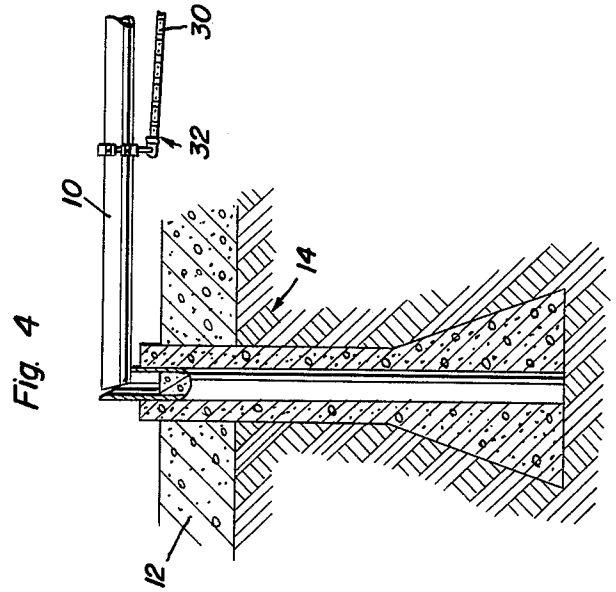


Fig. 4

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COLUMN STRUCTURE ERECTION METHOD

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Filed Sept. 7, 1960, Ser. No. 54,527
3 Claims. (Cl. 52—745)

This invention relates to a method for erecting column structures in building construction and the apparatus used in conjunction with such erection method. The novel method of this invention is especially useful for the erection of a building construction as disclosed in my prior copending application Serial No. 20,214, filed April 5, 1960, entitled Foundation Column, now Patent No. 3,108,403, issued October 29, 1963, although not necessarily restricted to the erection of such a building construction.

It is therefore a primary object of this invention to provide a novel method for erecting long and heavy column structures to thereby facilitate and render more practical the building of various types of structures which would otherwise be considered impractical because of the difficulties in raising such structures.

Another object of this invention is to provide a novel method for erecting column structures in a building construction by use of standard and economical equipment and also enabling more efficient assembling of the structural elements and involving a tremendous savings in time and labor.

A still further object of this invention is to provide a novel method for raising long column structures for a building eliminating the bending of such long column structures that would otherwise result from its erection.

An additional object of this invention is to provide a novel method for erecting long column structures employing a removable column reinforcement eliminating or resisting bending of the column structure while being raised, said column reinforcement subsequently being removed and reused for raising other column structures adjacent to the upright columns.

A still further object of this invention is to provide a removable chain shackle truss column reinforcement which involves an assemblage of relatively simple and dimensionally varying parts so as to provide a removable column reinforcement of varying sizes for accommodating any desirable column structure.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a schematic perspective view of a column structure and roof section in the process of being erected.

FIGURE 2 is a partial schematic perspective view of a column structure and roof section supported thereon in its erected position.

FIGURE 3 is a side elevational view of a column pivotally anchored in its horizontal position when temporarily reinforced by the reinforcement apparatus of this invention.

FIGURE 4 is an enlarged partial view of the base end of the horizontal temporarily reinforced column illustrated in FIGURE 3.

FIGURE 5 is a partial bottom view of a portion of the temporarily reinforced column of FIGURE 3.

FIGURE 6 is a sectional view taken through a plane indicated by section line 6—6 in FIGURE 5.

Referring now to the drawings in detail, FIGURE 3 illustrates a column member 10 which may constitute a portion of a column structure to be erected by means

of the method and apparatus of this invention. The column 10 is to be anchored within a concrete slab 12 by means of a foundation column anchor generally indicated by reference numeral 14 of the type disclosed in my aforementioned prior copending application Serial No. 20,214. Accordingly, the column member 10 may be pivotally raised to an upright position wherein it is rigidly anchored in the concrete slab 12 by means of the fundation anchor 14. It will be observed however in FIGURE 3, that the column member 10 is provided with the removable chain shackle truss reinforcement generally indicated by reference numeral 16. Accordingly, as the column member 10 is pivotally raised to its upright position, the removable reinforcement 16 will resist bending thereof. After the column member 10 has been erected, the reinforcement 16 may be removed therefrom for use on other columns.

Referring now to FIGURES 5 and 6 in particular, it will be observed that the removable reinforcement 16 is composed of a plurality of clamp members generally inidcated by reference numeral 18. Each clamp member 18 includes semi-circular sections 20 and 22 which are fitted about the column member 10 which is of tubular construction. A pair of clamping bolt members 24 are therefore provided in order to clamp the clamp sections 20 and 22 onto the tubular column member 10. Connected to one of the clamp sections 22 as by welding is a stud member 26 which includes at its radially outer end a guiding eye portion 28. The eye portion 28 therefore receives therein the flexible chain member 30. It will therefore be observed from FIGURE 3, that the stud members 26 which are connected to the column member 10 at spaced intervals therealong by means of the clamps 18 progressively vary in length. The stud member 26 of maximum length is therefore disposed at the center of the column member 10 with the stud members progressively being reduced in length toward the ends of the column member 10. Accordingly, the flexible chain member 30 by being guided through the eye portions 28 of each of the stud members 26 and anchored at its ends by means of a pivotal anchor 32 as more clearly seen in FIGURE 4, will form a truss reinforcement for the column member 10. It will therefore be appreciated that the reinforcement 16 is composed of clamp members 18 and stud members 26 of different lengths and numbers so as to accommodate the length of a particular column and the load carried thereon. Therefore, in order to practice the method of this invention one need only stock clamp and stud assemblies of different sizes which may be selectively assembled with the flexible chain 30 for accommodating the different erection requirements.

As a result of the use of the removable reinforcement 16 for an exemplary column member 10, the column member 10 may be positioned in a horizontal position as illustrated in FIGURE 3 before erection and the reinforcement 16 applied thereto. In such horizontal position a plurality of connecting members 34 may be welded to the horizontally disposed column member 10 so that when the column member is erected to its upright position the connecting members may then be welded to an adjacent upright column member in order to form a column structure. It will therefore be appreciated that much of the difficult welding by scaffold-supported welders is eliminated to thereby effect a tremendous saving in time and labor in erecting a building construction pursuant to the method of this invention.

Referring now to FIGURES 1 and 2, the particular application of the method of this invention will be illustrated. It will therefore be observed in FIGURE 1, that a building set generally indicated by reference numeral 36 has been erected to a vertical position. The

building set **36** is of the type which is composed of side column structures **38** and **40** which are interconnected and support a truss roof section **42**. This type of welded construction is disclosed in my aforesaid prior copending application. It will therefore be observed that a plurality of foundation anchors **14** are employed to anchor the side column structures **38** and **40**. It will also be observed that a second set **44** is disposed adjacent to the set **36** in a horizontal position including side column structures **46** and **48** interconnected by the truss roof section **50**. It will also be observed that movable truss reinforcements **16** are provided on the side column structures **46** and **48**. Also, a similar removable reinforcement **16** is provided between the ends **52** and **54** of the roof section **50**, said latter removable reinforcement **16** being disposed beneath the roof section **50** and not shown in FIGURE 1. Accordingly, the set **44** in its horizontal position will be rendered perfectly rigid by the three removable reinforcements **16**. It will also be observed in FIGURE 1, that a plurality of connecting members **34** have been welded to the various structural parts of the building set **44**, such welding obviously being accomplished with greater ease while the set **44** is in its horizontal position.

It will be further observed in FIGURE 1, that a cable **56** is anchored at its opposite ends to anchor points **58** and **60** on the building sets **36** and **44**, respectively. The anchor points **58** and **60** are therefore located at the center of the roof sections **42** and **50** of each building section. It will therefore be apparent that with the upright building set **36** being held rigidly in its upright position by suitable means such as guide ropes, a lateral force may be applied to the cable **56** by means of a gin pole **62**, for example, to thereby pivotally displace the building set **44** on its foundation anchors **14** to thereby raise the building set **44** to its upright position parallel to the upright building set **36**. Accordingly, as seen in FIGURE 2, the set **44** may be connected to the set **36** by welding the unwelded ends of the connecting members **34** to the set **36**. After the connecting members **34** have been welded and a rigid upright structure thereby attained, the removable reinforcements **16** are removed from the set **44** for subsequent use on additional building sets which may be erected and connected to the set **44** for example. It will therefore be understood that the erection procedure hereinbefore described will be repeated until a complete building is erected.

From the foregoing description, the utility of the method and the apparatus will be apparent. It will therefore also be appreciated that building constructions heretofore deemed to be impractical because of erection difficulties may now be erected in order to provide more endurable building constructions. Furthermore, as a result of the novel method and apparatus column erection in general may be accomplished with a tremendous savings in time, labor and erection equipment and also enable reduction of difficult welding.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A method for erecting a building structure consisting of sets of side columns having first and second ends interconnected by roof sections comprising the steps of: raising one set of side columns and interconnecting roof section to an upright position; assembling and anchoring said first ends of the columns of another set adjacent to the first ends of said one set substantially at ground level; attaching connecting members to said other set while substantially in a horizontal position supported by the ground adjacent said second ends of the columns; temporarily reinforcing the other set against bending due to erection; raising said reinforced set loaded with the connecting members thereon to an upright position parallel to said one set; connecting the connecting members to said one set after erection of said other set to the upright position; and removing the temporary reinforcements from the other set.

2. The method of claim **1** wherein said other set is raised to a vertical position by anchoring a cable to a center portion of the roof section thereof and applying a lateral force to the cable to pivotally displace the other set toward the first set.

3. A method for erecting long column structures comprising the steps of: erecting a column structure; pivotally anchoring a base end of a column substantially at ground level adjacent to said column structure; applying a removable truss reinforcement only to the column for resisting bending thereof in an erection plane; securing connecting means to the temporarily reinforced column at spaced locations between the base end and the opposite of the column while in a substantially horizontal position supported by the ground at said opposite end; pivotally raising the reinforced column loaded with said connecting means in the erection plane to an upright position; securing the connecting means to said column structure and thereafter removing the removable truss reinforcement from the column.

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