

Oct. 24, 1967

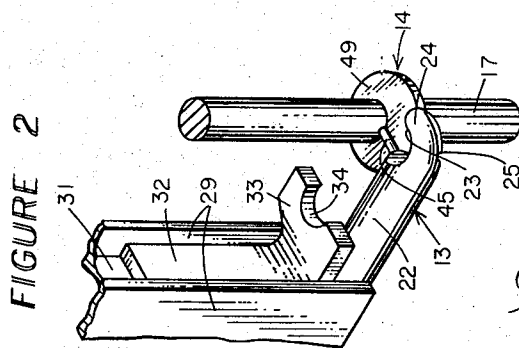
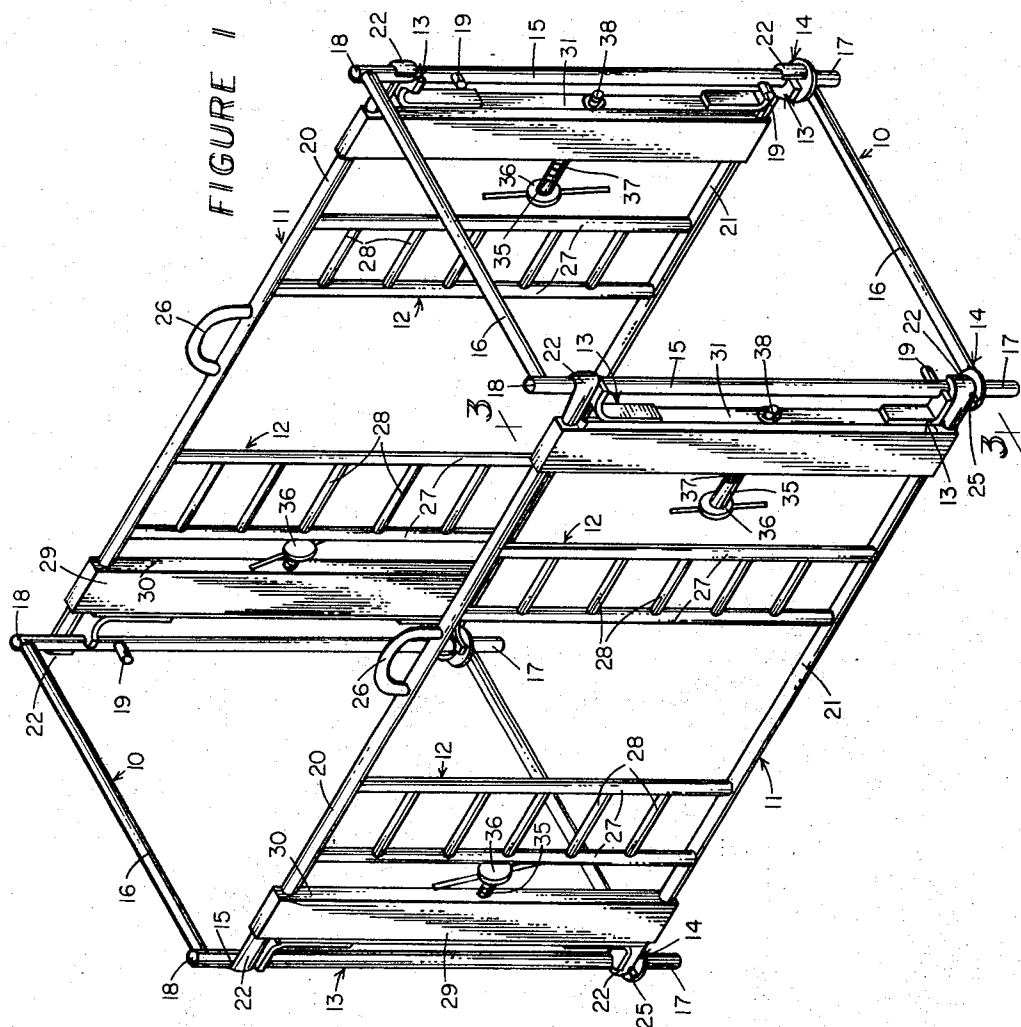
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3,348,631

SCAFFOLD SIDE MEMBER

Filed Aug. 1, 1966

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

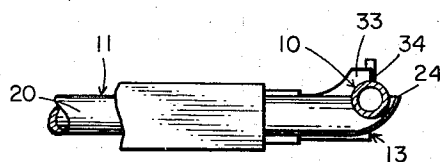
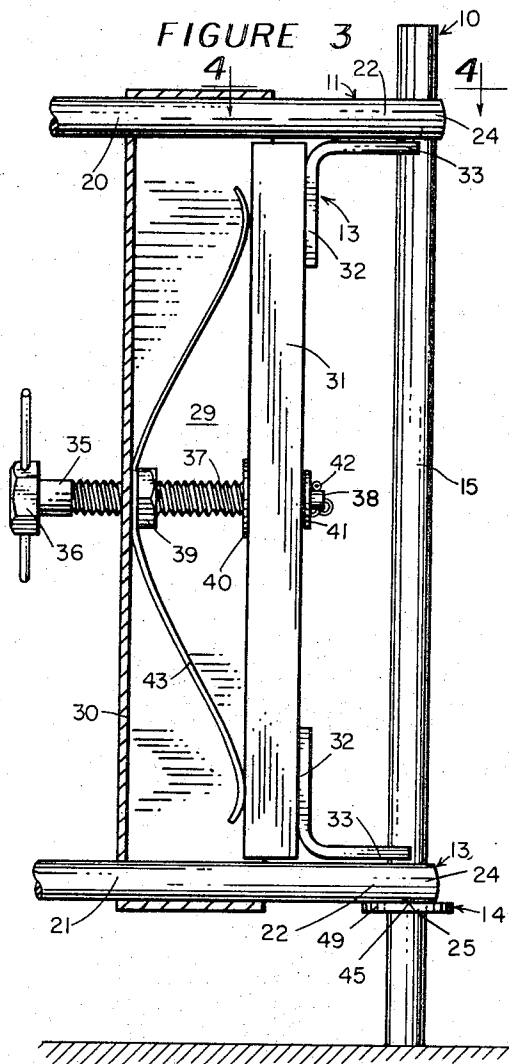


FIGURE 4

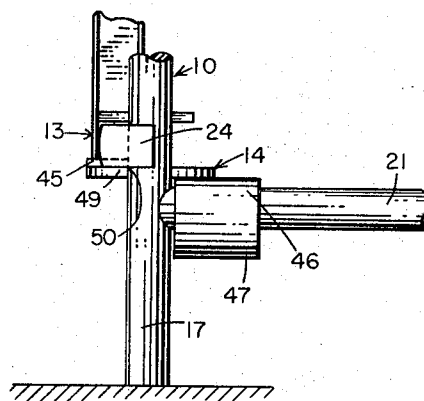
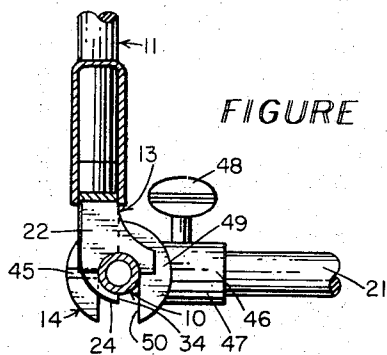


FIGURE 5



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3,348,631

SCAFFOLD SIDE MEMBER

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2 Claims. (Cl. 182—179)

My invention relates generally to a new and improved unitary side element for modular metal scaffolding, and more particularly to such an element that has ladder means incorporated therein and a novel means of releasably and movably attaching the side member to standardized end members.

Heretofore unitized, modular scaffolding members of a box-like nature, having planar rectangular end members joined by releasably communicating side members have become common in the construction arts. A plurality of such members may be assembled to form a scaffolding structure of any particular shape or size within the limits of the structural rigidity of the members. Generally such units are formed from similar components that may be interchangeably used, for ease of construction. Each modular element is similar to another to provide for ready substitution in a complete structure.

Such scaffolding structures, as heretofore have come into use, have generally had similar end elements embodying a peripheral, structural supporting frame with either no internal structure or only such as would add additional rigidity to the element. The side elements, distinguishable chiefly from their more elongate nature, have taken many forms. At first the sides were merely two elongate crossed bracing elements releasably attaching the end elements in spaced relationship to form the box-like scaffolding member. Later the side member evolved into a planar structure having a rectangular peripheral structural frame, oftentimes with some utilitarian components associated therewith. It is with this latter type of side member that the instant improvement is concerned.

With these thoughts and this background in mind the instant invention seeks to provide a new and novel metal scaffolding side element. In so doing it is:

A principal object of providing a planar scaffold side element, with structurally rigid peripheral frame, having a new and novel, screw activated, adjustably pivotable means of communication with an end element of modular scaffolding of general commerce.

A further object of my invention to provide such a structure that embodies ladder means associated with the member so as to provide additional support and structural rigidity to the side member and also to allow a workman convenient access over the side member.

A further object to provide such a device as aforesaid that provides for a positive, screw activated communication between side element and end element that allows an assembled structure to be moved, with pivotable motion between side and end members, to form a parallelogram of lesser width than the normal rectangular scaffolding unit to provide for more easy moving thereof, particularly through doorways or similar narrow passageways.

A further object of my invention to provide such a device as immediately aforesaid that has means of biasing said structure preferentially to a rectangular configuration.

A still further object of my invention to provide a structure of the nature aforesaid that is adapted for use with the standard scaffold end members of commerce with the addition of a small, inexpensive adaptor unit.

A still further object of my invention to provide a structure as aforesaid that has appurtenant means and structures adapted to aid both the manual and machine

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manipulation of the individual side unit and completed scaffold unit.

A still further object of my invention to provide a structure of the nature aforesaid of new and novel design, of simple and economic construction, of rugged and durable nature and one that is otherwise well adapted to the uses for which it is intended.

These and other objects of my invention will become apparent from a consideration of the following specification and the accompanying drawings which form a part of this application.

In carrying out the objects of my invention, it is to be understood that its essential features are susceptible of change in design and structural arrangement, with only one preferred and practical embodiment being illustrated in the accompanying drawings, as required.

In the accompanying drawings wherein like numbers of reference refer to similar parts throughout:

FIGURE 1 is an isometric view of an entire scaffold member assembled with ordinary end elements and two of my side elements.

FIGURE 2 is a partial, expanded isometric view of the lower communicating portions of side member and end member showing the detailed structure and method of communication.

FIGURE 3 is an orthographic, vertical cross-sectional view through the spring biased screw fastening means, taken on the line 3—3 of FIGURE 1 in the direction indicated by the arrows, showing the details of construction thereof.

FIGURE 4 is a partial horizontal cross-sectional view of the upper adjacent communicating structures of side and end elements taken on the line 4—4 of FIGURE 3 in the direction indicated by the arrows thereon.

FIGURE 5 is a partial orthographic side view of an adaptor unit that adapts my invention for use with the ordinary scaffolding end elements of commerce now presently used.

FIGURE 6 is an orthographic plan view of the same structure as shown in FIGURE 5.

Referring now to the drawings in greater detail and particularly to that of FIGURE 1, it will there be seen that my invention comprises essentially end members 10 releasably and pivotably joined by side members 11, each having vertical ladders 12, screw-activated fastening means 13 and rectangular biasing means 14. The entire structure illustrated forms one modular scaffolding unit which may be joined with other similar units (not shown) to form an entire scaffolding structure as well known in the art.

End members 10 have vertical posts 15 joined by horizontal bars 16 to form a structurally rigid peripheral frame. Generally vertical posts 15 are formed from a pipe-like stock with a central void adapted to receive a connecting member. Such connecting member (not shown) is adapted to releasably connect one post to another similar post vertically thereabove or therebelow. Commonly vertical posts 15 have perpendicularly projecting spaced studs 19 to aid in fastening crossed side elements of conventional design (not shown) thereto. Such end elements as described are common and standardized in the scaffold arts.

The side member 11 of my invention is formed with elongate upper horizontal beam 20 and spaced parallel similar lower horizontal beam 21, structurally united by ladders 12 and inwardly positioned fastening means 13, to provide a planar structurally rigid unit. The horizontally projecting ends 22 are formed, as illustrated particularly in FIGURE 2, with notch 23 and surrounding hook 24 adapted to fit about the vertical post 15 of end member 10 to aid in fastening the side element to the end element and give some rigidity to the communication.

The lower portion of the lower hook 24 is provided with a small aligning notch 25 adapted to communicate with the aligning ridge carried by the end member.

Upper horizontal beam 20 is provided with U-shaped bracket 24, structurally communicating therewith, to aid in the manipulation of the side members and scaffold units, particularly by mechanical means. Preferably bracket 26 should be medially located relative the end elements so that the scaffold unit will be balanced substantially at the apex of the bracket.

Ladders 12 include sides 27 joined by a plurality of rungs 28 of suitable dimension and length. Side members 27 structurally communicate between upper and lower horizontal peripheral members 20, 21. These ladders serve to provide for vertical access across the side members 11 and also provide additional rigidity to the member. Obviously, for access, one ladder on at least one side would be sufficient but a plurality of ladders are preferable for providing more convenient access and sufficient rigidity.

Fastening means structure 13 is shown best in the enlarged cross-sectional view of FIGURE 3, where it is seen to include a box-like housing formed by two similar, relatively thin planar side members 29 and a structurally communicating back member 30. These members structurally communicate between the upper and lower horizontal members 20, 21, near the lateral portions thereof. The housing slidably carries in its forward portion fastening beam 31 structurally communicating with paired L-shaped fastening members having vertical legs 32 structurally communicating with beam 31 and horizontal outwardly projecting legs 33 with notches 34 adapted to communicate with vertical posts 15 when brought into adjacency therewith. Fastening screw 35, with capstan head 36, central threaded portion 37, and forwardmost pin portion 38 is threadably engaged in an appropriate hole in the medial part of housing end member 30 so that it projects with its pin portion laterally therefrom.

Screw 35 is of such length that its pin portion 38 projects through an appropriate hole in the medial part of fastening beam 31. The screw is positioned rotatably in this hole with washer 40 on the inward facing surface of the fastening beam, washer 41 on the outer facing surface and cotter key 42 extending therethrough to maintain the screw in this relationship with the fastening beam 31. With this arrangement of parts, the fastening screw may be turned relative to end member 30 of the fastener housing to vary the extension of fastening beam 31 relative thereto. The dimensioning and total extension of screw 35 should be such as to allow horizontal legs 33 of the fastening members carried by the fastening beam 31 to come completely into and out of engagement with vertical posts 15 as desired.

Preferably a means of biasing fastening beam 31 to a laterally extended position is provided as indicated by the leaf spring 43 held about screw 35 by nut 39 as illustrated in FIGURE 3. Obviously this biasing means could take many other forms.

The rectangular biasing means is shown best in the illustrations of FIGURES 2, 5 and 6. It comprises a washer-like structure 49 carried by at least the lower portion of vertical posts 15, with its plane substantially horizontal or perpendicular thereto. This washer has in an appropriate position, projecting horizontally outward from post 15, the raised ridge 45 preferably of half-cylindrical cross-sectional shape and adapted to mate within the aligning notches 25 carried by the lower part of hooks 24 of the side members. With this structure, an assembled scaffold unit will be biased to a rectangular position by the ridges 45 normally fitting within the aligning notches 25. The elements will be maintained in this position with some force by reason of the action of gravity on the side elements but they yet are manually moveable from this rectangular position as desired to a rotated relationship, resulting in the formation of a parallelogram in the entire scaffold unit.

In commercial end members presently used in scaffolding structures of commerce, there is no such washer structure 14 as immediately before described. An appropriate adapter, as illustrated in FIGURES 5 and 6, of inexpensive construction may be provided to serve this purpose. This adapter has the U-shaped body piece 46 with downwardly extending legs 47 forming a central void adapted to allow the member to be positioned over the lower horizontal beam 21. The body part 46 has set screw 48 threadably extending therethrough and into communication with lower horizontal beam 21 to maintain the unit in appropriate position, once placed. Washer 49 structurally communicates with body piece 46 and carries ridge 45 to serve the same purpose as afore-specified for this member. Obviously for the washer to be positionable upon the end member, an appropriate slot 50 must be provided therein to allow the washer to pass over vertical post 15 and be properly positioned thereabout.

For simplicity of manufacture and standardization of components as well as durability and maintenance, I prefer that my entire structure should be formed from metal, the peripheral members preferably being formed from hollow pipes structurally joined by welding. The preferred embodiment illustrated is substantially at scale though obviously modifications might be provided so long as the various mechanical requirements are met.

Having thus described the structure of my invention, its operation may be understood:

Two side members 11 are formed according to the previous teachings and are appropriately dimensioned to join end members of the normal commercial sizes. The members are then joined, as illustrated in FIGURE 1, to form a scaffolding unit with side elements communicating between the spaced opposed end elements 10. To accomplish this joinder the fastening screws 35 are released until the horizontal leg 33 of the fastening member is in an inward position such that will not communicate with posts 15 when the side members be placed thereon. The side member is then placed upon the posts with hooks 24 about the laterally outward surface thereof. The fastening screws are then turned to move the fastening beam laterally outward until vertical legs 32 come into contact with posts 15 and pivotably hold the members in communication. In this condition the member will be biased to a rectangular configuration by means of communication between raised ridges 45 of the end members and aligning notches 25 of hooks 24.

If it be desired to change the shape of the unit into that of a parallelogram, this may be accomplished merely by the exertion of some manual force on adjacent side and end members to move them into the desired position. Gravity acting upon the side members will cause some resistance to initial motion as the side member will have to be forced upward to allow movement relative to the end member because of the communication between ridge 45 and notch 25. This force can be appropriately regulated, however, by size and configuration of the two communicating members and may be made as slight or great as desired. Once assembled, a plurality of the scaffold units may be assembled side by side, end to end or on top of each other to form a desired final configuration as well known in the scaffold arts. The scaffolding units may obviously be disassembled by the reverse of the operation previously described.

Although the foregoing description is necessarily of a detailed character so that a specific embodiment of my invention may be set forth as required, it is to be understood that various modifications of parts, multiplication and rearrangement thereof and changes in design and ordering may be resorted to without departing from its spirit, essence or scope.

Having thus described my invention, what I desire to protect by Letters Patent, and what I claim is:

1. A side member for modular scaffolding of the nature

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aforesaid, for use with rigid, planar end members having a cylindrical, peripheral frame, including, in combination:

- 5 spaced, parallel upper and lower horizontal beams having laterally extending ends with configuration adapted to fit about the laterally outward surface of cylindrical vertical scaffold end members;
- 10 at least one ladder structurally communicating, substantially vertically, between said spaced, horizontal beam members; and
- 15 paired, opposed fastening means structurally communicating between said upper and lower beam members near the lateral extensions thereof, including a housing, a fastening beam member outwardly biased but laterally moveable within said housing, screw means extending between said housing and said fastening beam to cause lateral movement therebetween and fastening means carried by said fastening beam member adapted to pivotably engage the cylindrical vertical posts of said end member.
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2. The invention of claim 1 further characterized by

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means of biasing an assembled scaffold unit to a rectangular shape, including:

- at least one horizontal washer-like structure carried by a vertical peripheral member of said scaffold end positioned to support the lateral-most extension of one horizontal side beam and having means of preferentially angularly positioning said horizontal side beam relative thereto; and
- means carried by the lateral-most extension of said horizontal side beam adapted to cooperate with said preferential positioning means carried by aforesaid scaffold end member to bias said structures to a rectangular relationship.

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