June 5, 1962 G. W. CAUSEY 3,037,588

SCAFFOLDING

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Fig. 1

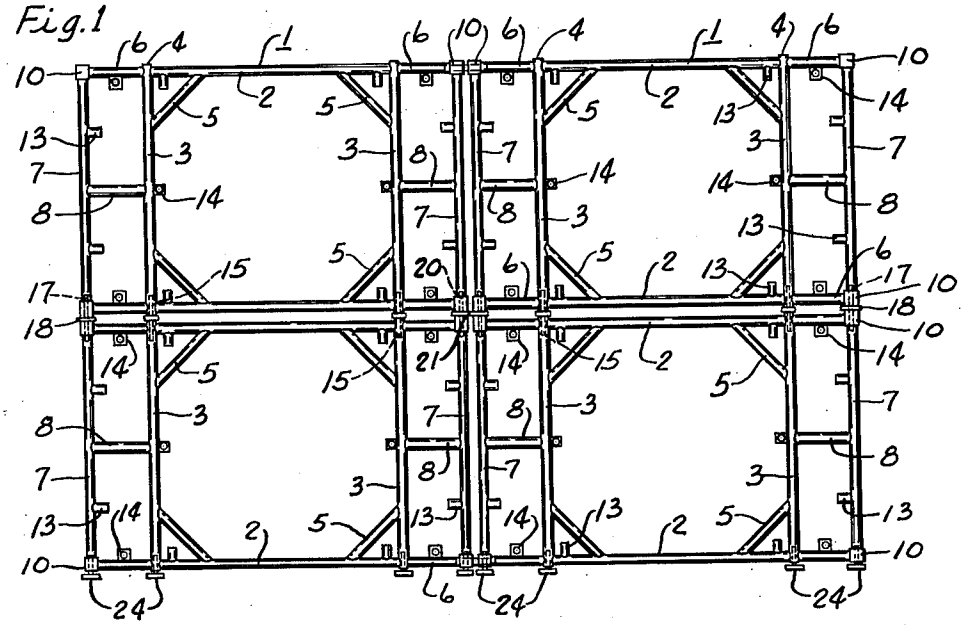


Fig. 6

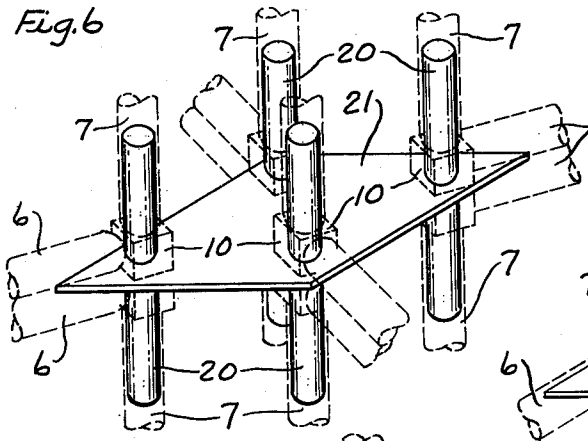


Fig. 4

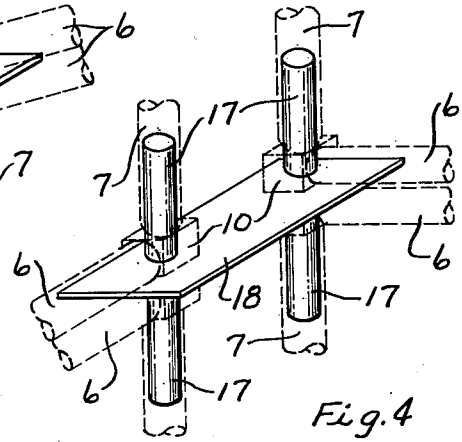
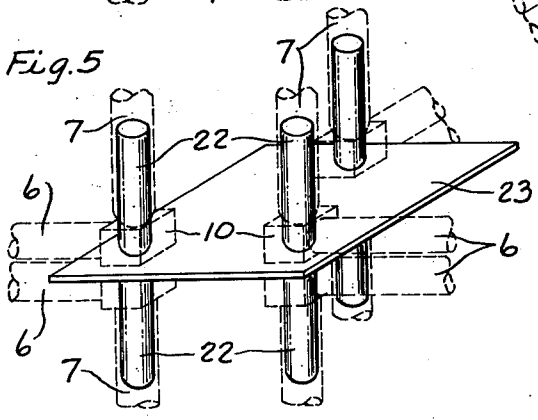


Fig. 5



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Fig. 3

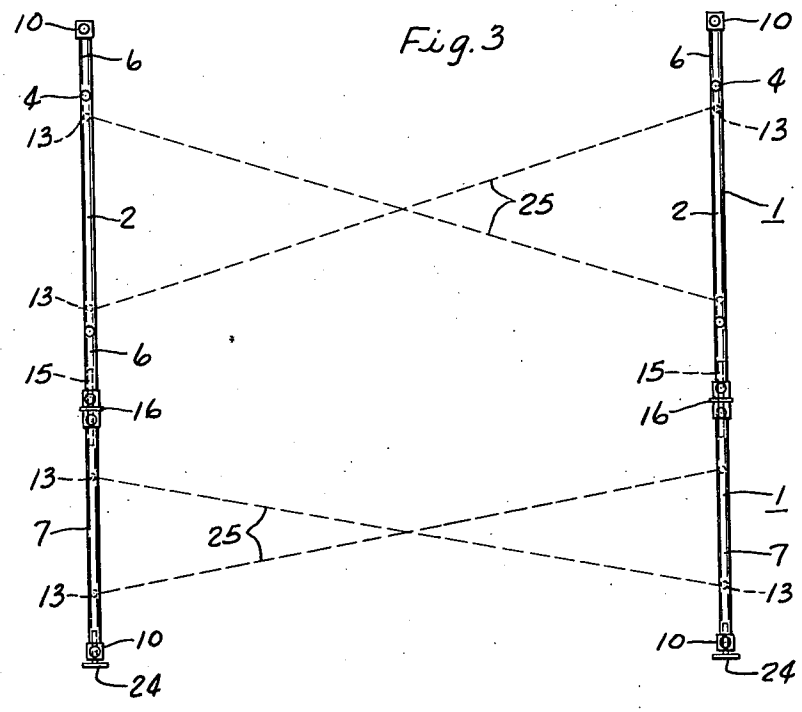
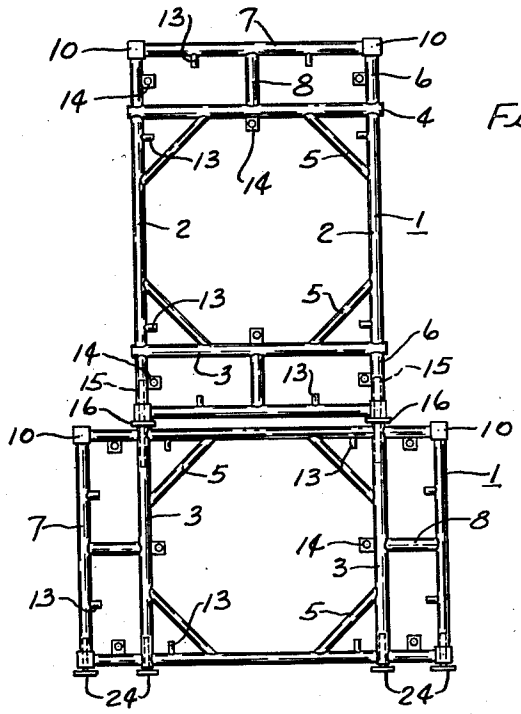


Fig. 2



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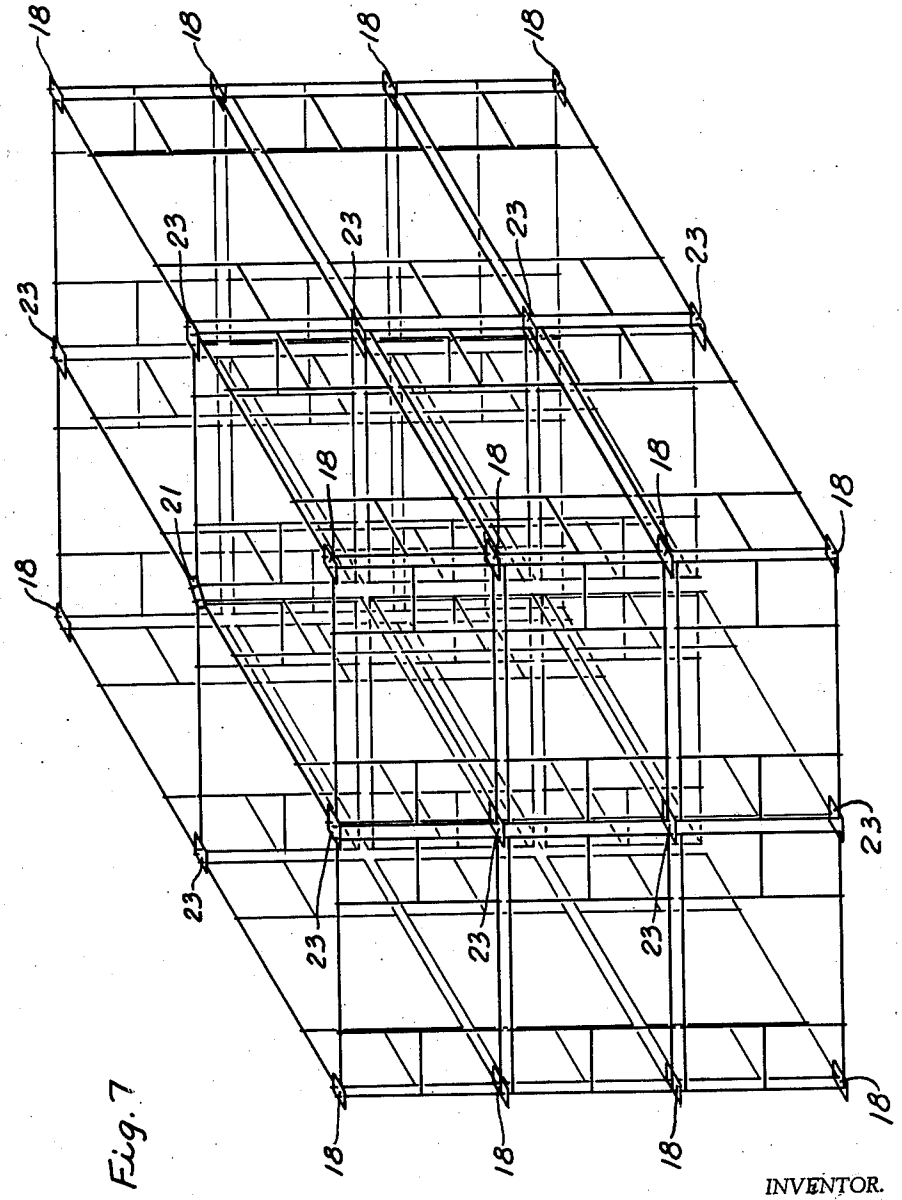


Fig. 7

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Fig. 8

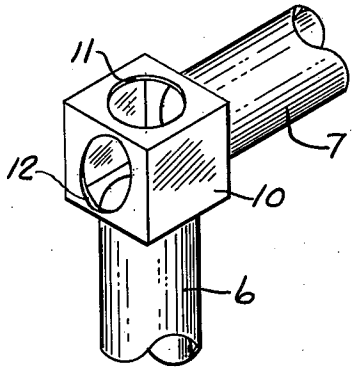


Fig. 11

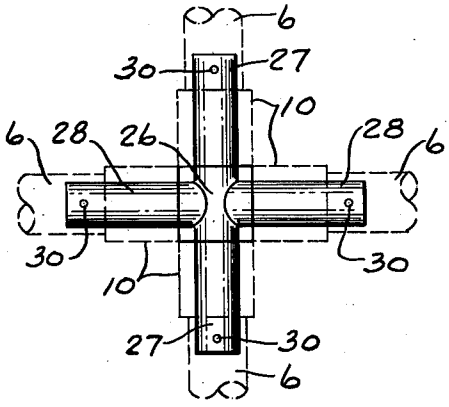


Fig. 10

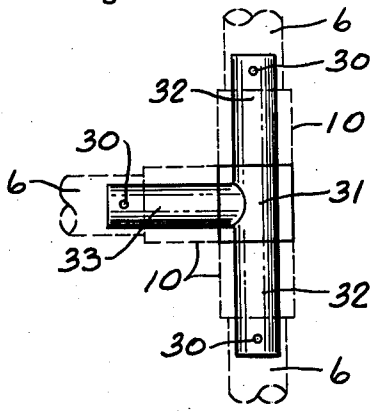
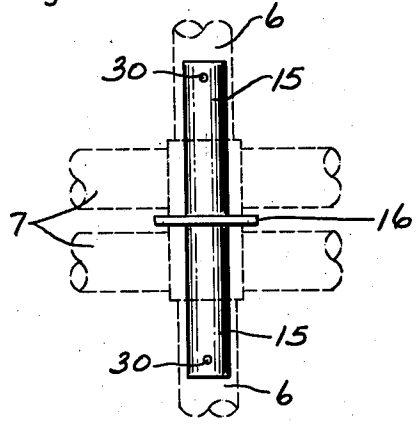


Fig. 9



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3,037,588

SCAFFOLDING

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Filed May 21, 1959, Ser. No. 814,907
3 Claims. (Cl. 189—15.5)

This invention relates generally to scaffolding and more particularly to the construction of the joints connecting the adjacent scaffolding units to one another.

The principal object of this invention is the provision of box members on the ends of longitudinal and traverse rails making up the sides and ends of the uniplanar scaffolding unit.

Another object is the provision of interlocking pin members connected as an independent construction joint for insertion in adjacent sockets to interlock parallel columns constructed of scaffolding units. These interlocking joints are provided between the adjacent ends of each scaffolding unit forming a column and are preferably assembled simultaneously with the adjacent columns.

Another object is the provision of interlocking joints between scaffolding units forming adjacent columns which units have their longitudinal dimension greater than their transverse dimension but may be intercoupled by means of the interlocking joints so as to provide varied selective heights by the use of the same scaffolding units.

Another object is the provision of an interlocking joint member for interconnecting at each scaffolding unit level from two to four different columns at the same joint.

Another object is the provision of a joint member in the form of an X for interlocking two horizontal and two vertical rails lying in the same plane.

Another object is the provision of a box end for the rail member of a scaffolding unit for connecting the ends of two rails of a scaffolding unit which meet at right angles at the end of the unit.

Other objects and advantages appear hereinafter in the following description and claims.

The accompanying drawings show for the purpose of exemplification without limiting this invention or the claims thereto certain practical embodiments illustrating the principles of this invention wherein:

FIG. 1 is a side elevation of four scaffolding units two in each column and mounted in a single plane.

FIG. 2 is a side elevation of two superimposed scaffolding units the lower one being placed on a longitudinal edge and the upper one being disposed with its greatest dimension vertically and interconnected with the lower unit.

FIG. 3 is a view in end elevaiton of two parallel scaffolding units superimposed on each other such as illustrated in FIG. 2 with an indication of the cross bracing therebetween.

FIG. 4 is an enlarged detailed section showing the four corners of four scaffolding units being interconnected with each other by means of the joint member comprising this invention.

FIG. 5 is an enlarged detailed section showing the six corners of six scaffolding units being interconnected with each other by means of the joint member comprising this invention.

FIG. 6 is an enlarged detailed section showing the eight corners of eight scaffolding units being interconnected with each other by means of the joint member comprising this invention.

FIG. 7 is an isometrical schematic view illustrating a cubit formed by scaffolding units interconnected with each other by the independent joint members comprising this invention.

FIG. 8 is an enlarged view of a corner box on a scaffolding unit.

FIG. 9 illustrates an independent pin joint member interconnecting subjacent scaffolding units.

FIG. 10 is a view illustrating a modified form of an independent pin joint member interconnecting three scaffolding units that converge at a single point.

FIG. 11 is a view of a modified independent pin joint member connecting four converging scaffolding units.

Referring to FIGS. 1 to 3 the structural scaffolding unit indicated at **1** is similar in shape and dimension to that disclosed in United States Patent 2,478,088 issued to me on August 2, 1949. This scaffold unit **1** consists of a structural member made of pipe or tubing and consists of a central square made up of the side rails **2** and the transverse cross rails **3**. The ends of the pipe forming the side rails **2** are cut so as to fit the surface of the cross rails **3** and are welded thereto thereby providing a portion of the unit that is substantially square and the ends of the cross rails **3** are open as indicated at **4** to provide sockets at opposite ends of the frame. The side rails and cross rails are also braced by the knee brackets **5** at each corner which are likewise shaped to fit the exterior surface of the side and cross rails and are welded thereto.

The side rails **2** are extended by the short sections **6** which are fitted to and welded to their respective cross rails **3** and their outer ends are joined with the end rail **7**. A central strut member **8** is provided between the cross rail **3** and the corresponding end rail **7** in the center thereof. The structure so far is substantially the same as my previous structure. However, the ends of the side rail extensions **6** are open to provide the only sockets at the end of the scaffold unit.

The present structure provides a box member **10** at the juncture of the extension side rails **6** and the ends of the end rails **7**. This box structure is clearly shown in FIG. 8 and is slightly larger in its cubicle dimension than the diameter of the rail members **6** and **7** that are joined together by the box member **10**. The box member **10** is provided with two aligned openings in a single plane, two of which are constructed to receive the open ends of the pipes forming the rails **6** and **7** and the other two indicated at **11** and **12** being in alignment with the respective pipe sections **6** and **7**. Thus the box structure **10** increases the number of sockets on each scaffolding unit over that previously provided in that the openings or sockets **12** align with the end rails **7** and provide an additional mode of attaching subjacent scaffolding units together.

Each scaffolding unit is provided with the pins **13**, one behind each knee brace **5** making four in the central portions of the scaffolding unit and two on the end rail **7** making a total of eight pins for each scaffolding unit. These pins are similar to those provided on my aforementioned patented scaffolding unit and are preferably threaded or provided with some means of retaining cross braces for connecting the adjacent columns of scaffolding units together by cross braces which are generally formed from tubing members having their ends flattened and holes drilled through the flattened portions to permit one or more brace members to be attached to the same pin. Each of the cross rails **3** and the extension side rails **6** are provided with the central bracket **14** having a hole therethrough for the purpose of bolting thereto additional brace members. It will be noted that the holes passing through the brackets **14** are disposed in the plane common to each of the rails forming the scaffolding unit, however, the axes of the pins **13** also lie in the same plane but they are disposed at right angles relative to the axes of the holes passing through the brackets **14**.

Each of the subjacent scaffolding units **1** as shown in FIG. 1 are connected vertically by the pin members **15** which extend into the sockets on the ends of the cross

rails **3** as shown in FIG. 9 which pin member is bisected by a plate member **16**. Thus each of the cross rails **3** of the subjacent scaffolding units **1** are interconnected by pin members **15**, whereas the selected of the end rails **7** are connected by the pin members **17** which are bisected by the plate member **18** as shown in FIG. 4. Thus each of the vertical columns formed in the scaffolding as illustrated in FIG. 1 is connected by a pin. The vertical columns formed by the rails **7** are joined by the pins **17**, whereas the vertical columns formed by the cross rails **3** are joined by the pins **15** and intermediate the length of these pins a plate is provided in each instance for carrying its corresponding or associated pin for the purpose of interlocking adjacent columns together at each joint. The contralmost joint between the frames **1** as shown in FIG. 1 would employ the pins illustrated at **20**, each of which are connected by the horizontal square plate **21** as illustrated in FIG. 6 for the purpose of coupling four of the end rails **7** at one horizontal joint. Such a central joint would be illustrated at **21** in FIG. 7. If three vertical columns of rails meet at one horizontal position, the structure shown in FIG. 5 is employed wherein the pins **22** connect the three adjacent corner members through the plate **23**.

Each of the pins as illustrated at **15**, **17**, **20** and **22** may be provided with openings and corresponding openings may be provided through the rails themselves or even in the boxes **10** for the purpose of locking the pin to the scaffolding frame. However, the weight of the column itself would be adequate to secure each joint together. It is preferable to make the pins sufficiently long so that when the frame is dropped down over the same it will be very difficult, if not impossible, for it to unlock or otherwise become disengaged from its subjacent member.

As shown in FIG. 1 each of the lowermost columns formed by the rails **3** and **7** are provided with feet **24** which are preferably adjustable vertically so as to compensate for differences in elevation on the ground on which the scaffolding is positioned.

If the structure of the scaffolding is similar to that shown in FIGS. 2 and 3 wherein the lower units **1** are lined with their longest dimension horizontal and the next additional unit is mounted thereon with its longest dimension vertical the cross rails **3** function as column members in supporting the ends of the side rails **6** and a single pin member **15** is employed. Such a structure is cross braced by connecting the brace members **25** to the pin members **13**. The brace members **25** connecting the lower frames being attached to the pins **13** on the end rails **7**, whereas the upper set of brace members **25** are connected to the pin members **13** on the side rails **2**.

When it is necessary to connect four adjacent units in the horizontal plane the cross pin member such as illustrated in FIG. 11 may be employed. In this structure the cross member is provided with a box **26** which has cross pins **27** and **28** extending therefrom. Each of these cross members pass through the box **10** of the end

of the rail **6** for adjacent scaffolding units. When these scaffolding units are connected in this manner it is preferable that they be locked by the pin **30** which passes through the rail members **6** and the ends of the pins **27** and **28**. If the scaffolding units are to be joined at corners where there are only three adjacent scaffolding units, then the structure as shown in FIG. 10 is employed wherein the box member **31** is provided with the pin member **32** that extends therethrough and is provided with an additional pin member **33** extending at right angles therefrom. Here again the pins **30** are provided to lock the pin members **32** and **33** to their respective rail members **6**. In this manner the scaffolding can be built up as a solid unit and each adjacent column member may be interlocked either by the vertical pins formed integral with horizontal plates or by horizontal pins formed integral with box members. These interlocking joints together with the brace structure usually provided will result in a very strong and steady scaffolding.

I claim:

1. A scaffold unit constructed of a plurality of assembled integral polygon units each of which consists of spaced parallel side rails, a hollow box having flat faces with the first face integrally joined on the ends of each side rail, a pair of parallel tubular end rails with their ends integrally joining the second face of each respective pair of boxes at right angles to said first face to complete the integral uniplanar four-sided polygon, the faces on said boxes opposite said first and second faces having openings aligning and coextensive with the openings in said tubular rails intergral with the boxes, pin means for connecting adjacent similar integral polygon units including a plate with at least two integral parallel pins extending vertically through and on both sides of the plate and into the adjacent aligned openings of the boxes of two sets of subadjacent integral polygon units and into their respective rails, said plate being flat to provide bearing means engaging the flat faces of said boxes of said integral polygon units and limit the extent of the pin insertion into said rails.

2. The scaffold unit of claim 1 characterized in that said pin means has three pins joining the boxes of three sets of subadjacent integral polygon units.

3. The scaffold unit of claim 1 characterized in that said pin means has four pin means joining the boxes of four sets of subadjacent integral polygon units.

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