

April 15, 1969

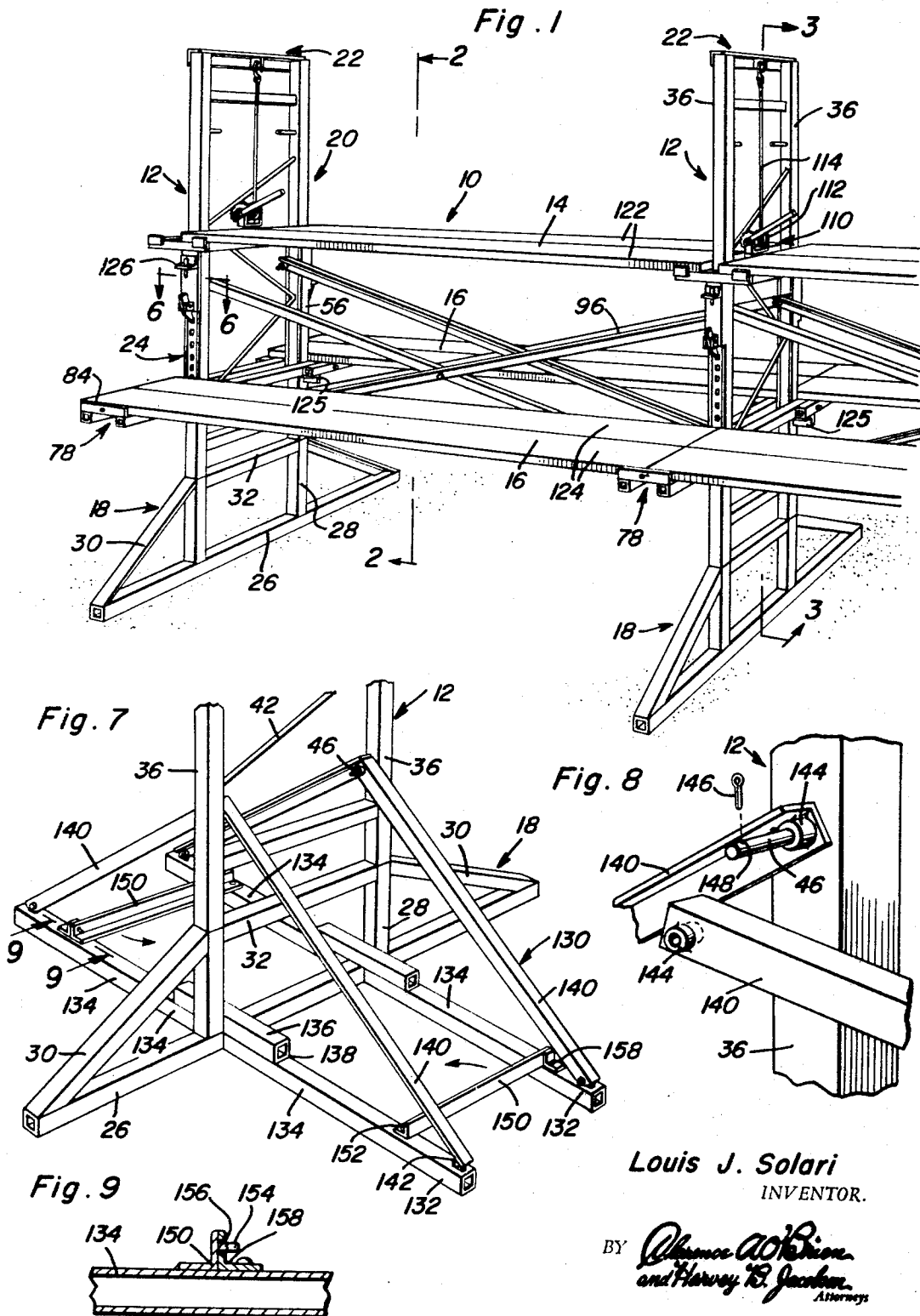
L. J. SOLARI

3,438,460

SCAFFOLD WITH ELEVATABLE SECTION

Filed Nov. 9, 1966

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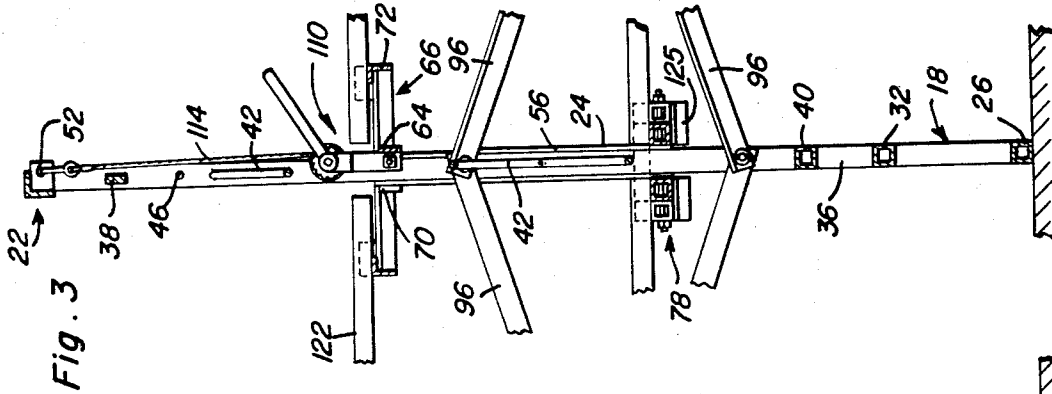
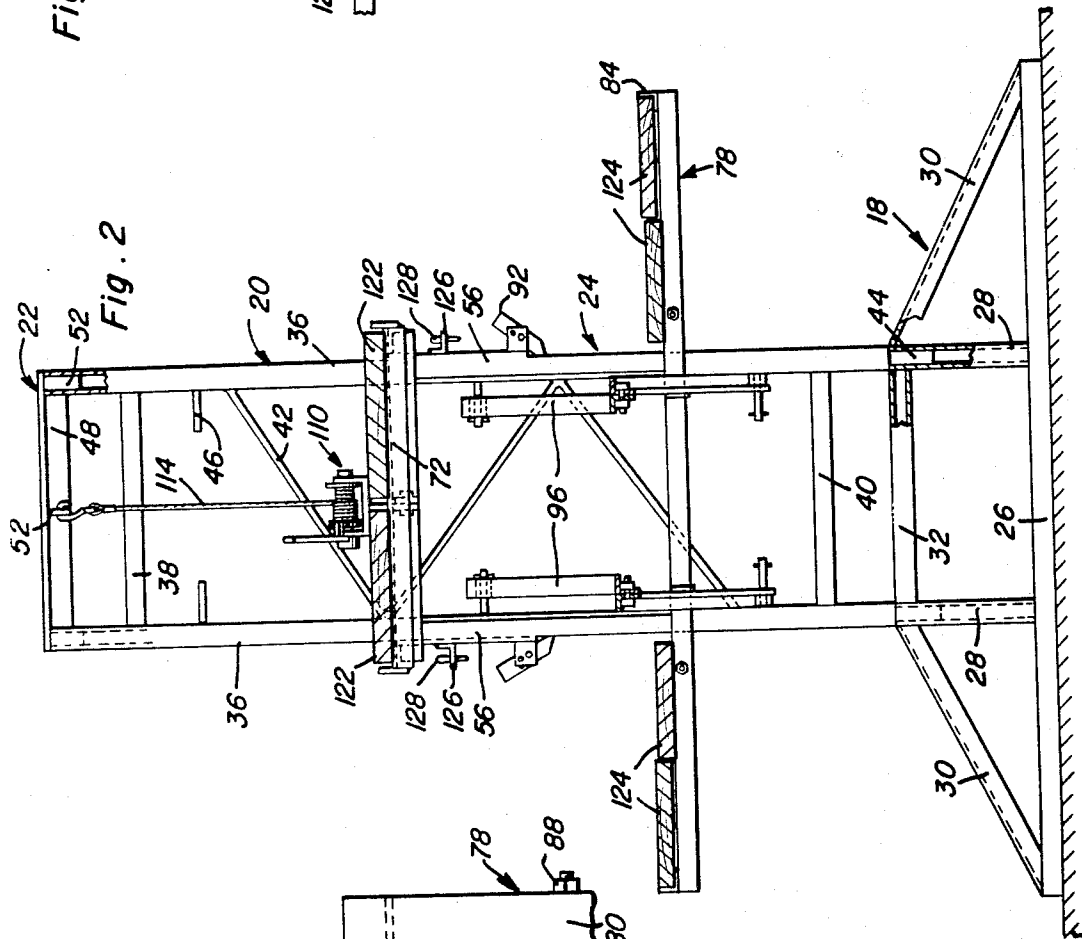
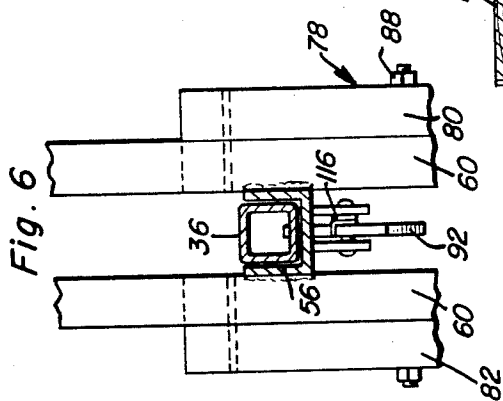
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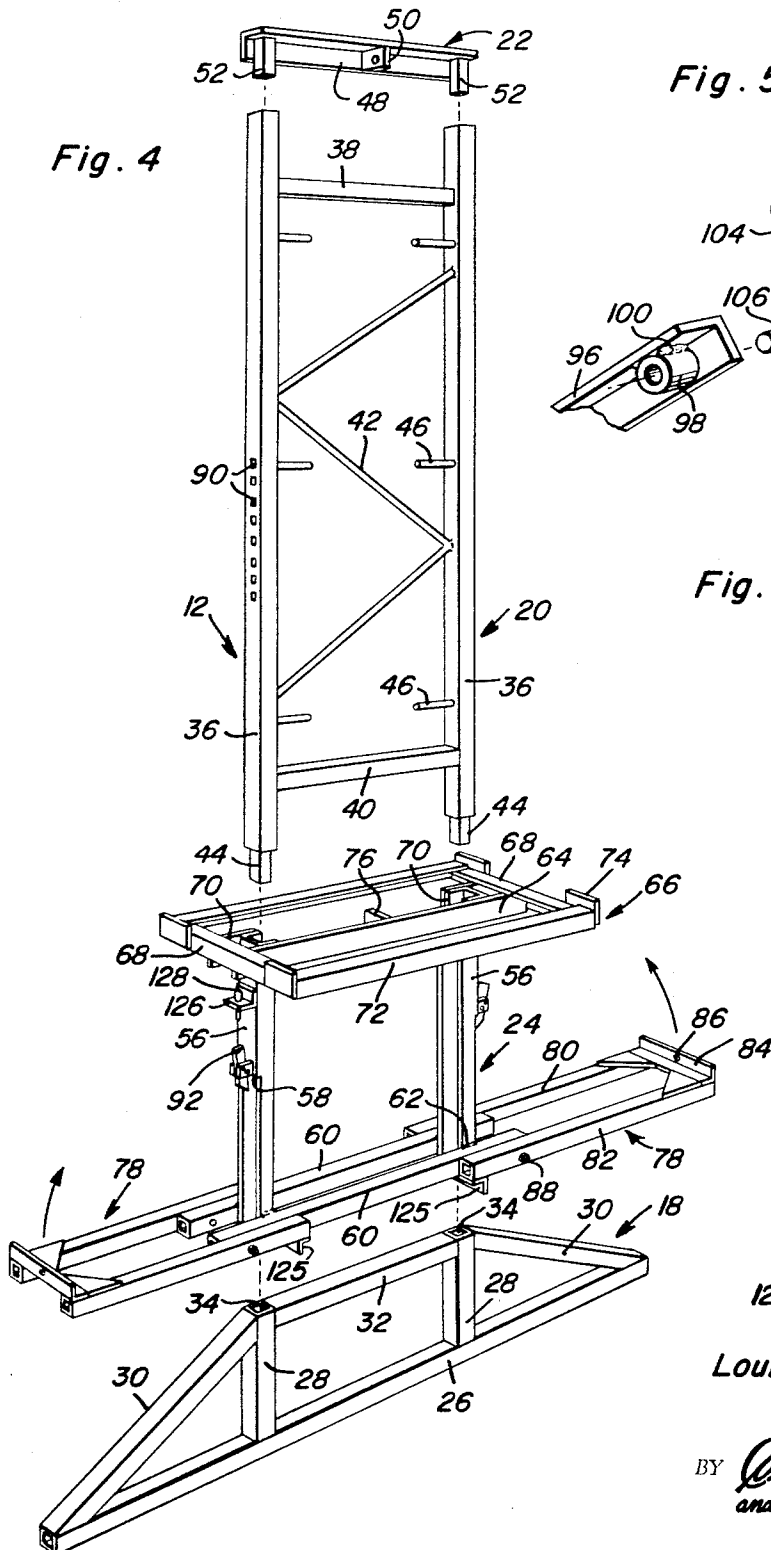


Fig. 5

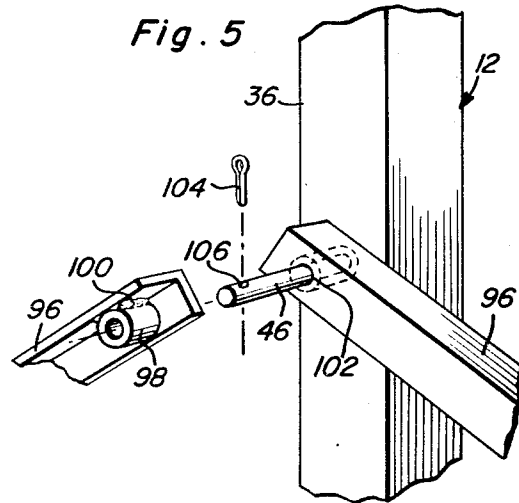
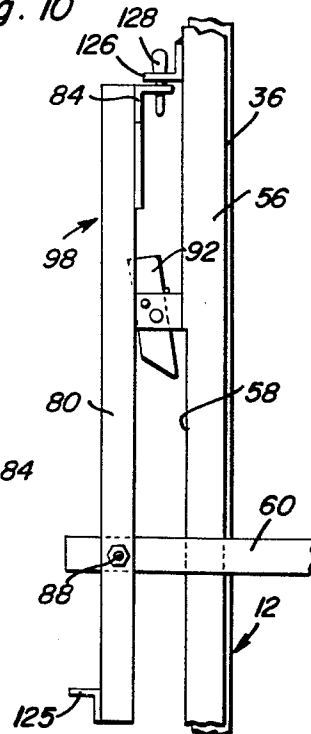


Fig. 10



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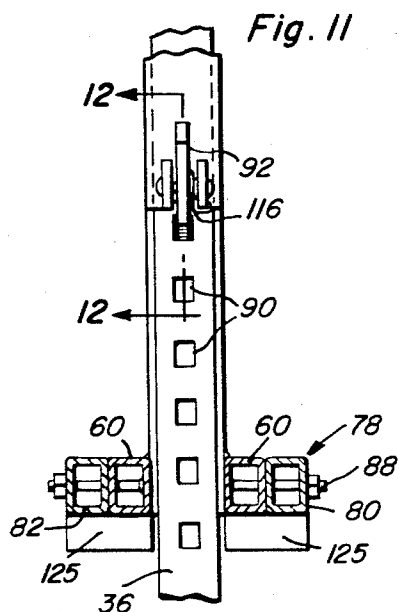
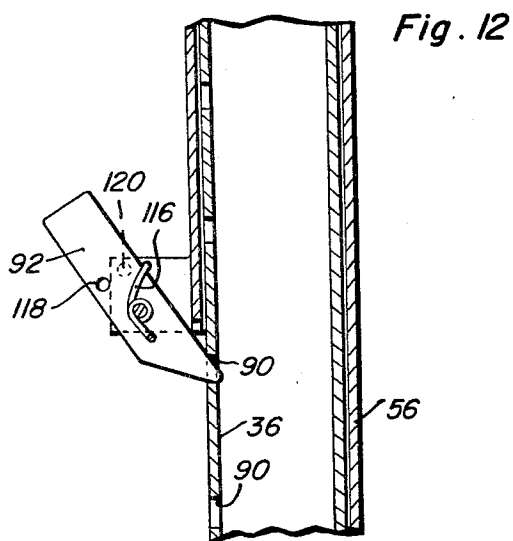
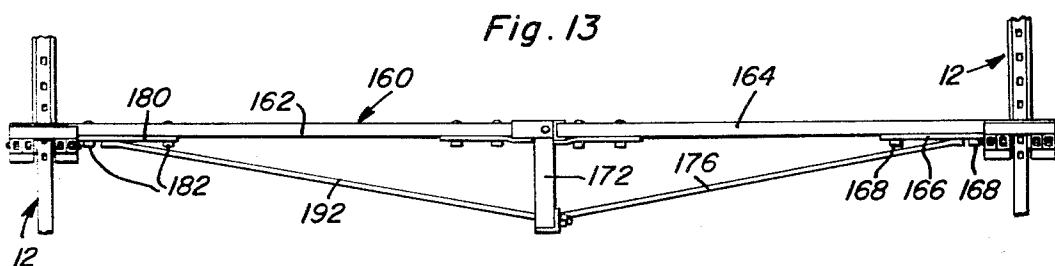
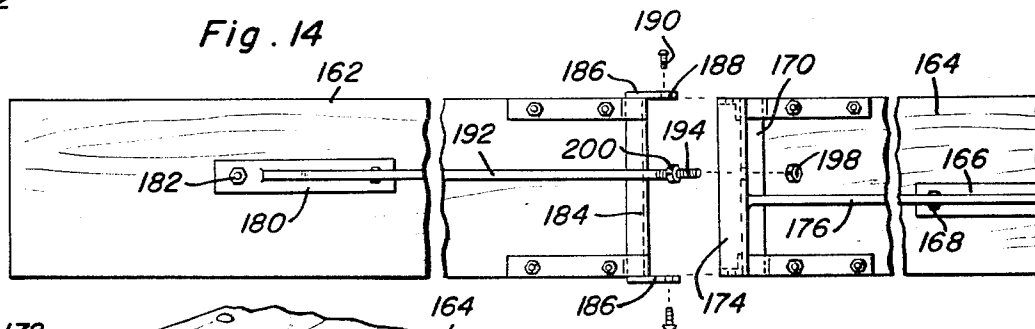
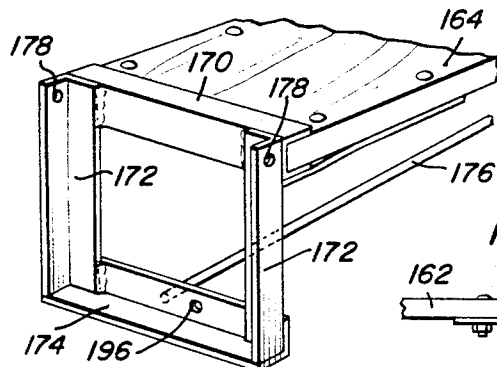
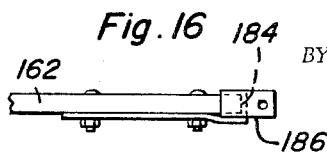
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SCAFFOLD WITH ELEVATABLE SECTION

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3,438,460 SCAFFOLD WITH ELEVATABLE SECTION

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9 Claims

ABSTRACT OF THE DISCLOSURE

An upright standard adapted to be utilized in pairs and to have an elongated horizontally disposed workmen's supporting section supported therefrom at one end with the other end of the workmen's supporting section being supported from another standard. The upright standard includes an elevatable section mounted thereon for movement therealong from which the corresponding end of a workmen supporting platform may be supported and the base section of the standard is horizontally elongated and includes upwardly convergent opposite end portions interconnected at their upper ends by means of a horizontal portion while the elevatable section is horizontally elongated and generally parallels the base section. The elevatable section defines a longitudinally extending upstanding slot in which the upwardly convergent portions and the interconnecting upper portion of the base section are receivable when the elevatable section is in its lowest position on the standard.

This invention relates to a novel and useful scaffold assembly including a workmen supporting section and more specifically to a scaffold assembly including means for adjustably varying the elevation of the horizontal workmen supporting section thereof.

The scaffold of the instant invention includes numerous features thereof such as a prestressed workmen supporting platform, collapsible standard assemblies for supporting the workmen supporting platform sections from their opposite ends, improved bracing for the standard assemblies, collapsible horizontal support arm assemblies for the standards from which the horizontal workmen supporting sections are adapted to be supported, and supplemental standard assembly bracing structures which may be collapsed into a compact state for storage as well as other less significant structural features which individually and collectively result in improvements in strength, durability, safety and operation.

The main object of this invention is to provide an improved scaffold construction that may be readily disassembled for transport and storage in a compact state and yet which includes means for supporting the workmen supporting platforms thereof for ready vertical adjustment.

Another object of this invention, in accordance with the immediately preceding object, is to provide a scaffold including prestressed workmen supporting platform sections.

Still another object of this invention is to provide a scaffold including standard assemblies therefor which may be readily disassembled for compact storage and transport.

Another object of this invention is to provide a scaffold standard assembly including collapsible generally horizontally outwardly projecting support arm portions carried by a vertically adjustable portion of the standard assembly and adapted to support generally horizontally disposed elongate workmen supporting sections from the opposite ends thereof.

A still further object of this invention is to provide a scaffold standard structure including collapsible bracing

assemblies which may be utilized to provide a more rigid base for the standard assemblies and to establish a base of greater plan area for contact with the ground.

A further object of this invention is to provide a scaffold with a vertically adjustable horizontally disposed workmen supporting section including safety stop means whereby the workmen supporting section may be positively locked in adjusted elevated position against downward movement relative to the supporting standards therefor.

A final object of this invention to be specifically enumerated herein is to provide a scaffold assembly in accordance with the preceding objects and which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that will be economically feasible, long lasting and relatively trouble-free in operation.

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 fragmentary perspective view of the scaffold assembly of the instant invention;

FIGURE 2 is an enlarged transverse vertical sectional view taken substantially upon the plane indicated by the section line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged fragmentary longitudinal vertical sectional view taken substantially upon the plane indicated by the section line 3—3 of FIGURE 1;

FIGURE 4 is an exploded perspective view of one of the standards of the scaffold assembly;

FIGURE 5 is a fragmentary exploded perspective view of one of the standard assemblies on somewhat of an enlarged scale and illustrating the manner in which the crossed bracing members between adjacent standard assemblies are secured to the latter;

FIGURE 6 is an enlarged fragmentary horizontal sectional view taken substantially upon the plane indicated by the section line 6—6 of FIGURE 1;

FIGURE 7 is a perspective view of a lower portion of one of the standard assemblies on somewhat of an enlarged scale with a removable and collapsible bracing assembly operatively associated therewith;

FIGURE 8 is an enlarged fragmentary exploded perspective view illustrating the manner in which the bracing assembly of FIGURE 7 is removably secured to the associated standard assembly;

FIGURE 9 is an enlarged fragmentary sectional view taken substantially upon the plane indicated by the section line 9—9 of FIGURE 7;

FIGURE 10 is a fragmentary elevational view of one of the lower sections of one of the standard assemblies shown with the workmen supporting platform arm thereof in a retracted position;

FIGURE 11 is a fragmentary enlarged elevational view of the assemblage illustrated in FIGURE 10 as seen from the left side thereof and with the pivoted support arm for the workmen supporting platform in its lowered operative position and having portions thereof broken away and illustrated in vertical section;

FIGURE 12 is an enlarged fragmentary vertical sectional view taken substantially upon the plane indicated by the section line 12—12 of FIGURE 11;

FIGURE 13 is a side elevational view of one of the prestressed sectional workmen supporting platforms of the scaffold;

FIGURE 14 is an exploded bottom plan view of the workmen supporting platform illustrated in FIGURE 13

on somewhat of an enlarged scale and with portions thereof being broken away;

FIGURE 15 is a fragmentary perspective view of the left end of the right hand section of the workmen supporting platform illustrated in FIGURE 13; and

FIGURE 16 is a fragmentary side elevational view of the right end of the left section of the workmen supporting platform illustrated in FIGURE 13.

Referring now more specifically to the drawings the numeral 10 generally designates the scaffold of the instant invention. The scaffold 10 includes a plurality of upright standard assemblies generally referred to by the reference numerals 12 and an upper central and vertically adjustable workmen supporting section 14 as well as a pair of lower opposite side workmen supporting sections 16.

With attention now invited more specifically to FIGURES 1 and 4 of the drawings it may be seen that each standard assembly 12 includes a lower base section generally referred to by the reference numeral 18, an intermediate section generally referred to by the reference numeral 20, an upper terminal end section generally referred to by the reference numeral 22, and a vertically adjustable section generally referred to by the reference numeral 24.

Each of the lower base sections 18 includes an elongated base member 26 including a pair of spaced uprights 28 intermediate its opposite ends. A pair of inclined brace members 20 are secured between each upright 28 and the corresponding end of the base member 26 and an upper horizontal brace member 32 is secured between the upper ends of the uprights 28. All of the components comprising the lower base section 18 may be constructed of suitable tubular material secured together in any convenient manner such as by welding and it will therefore be noted that the uprights 28 define upwardly opening recesses 34.

Each of the intermediate sections 20 includes a pair of uprights 36 interconnected by means of upper and lower transverse brace members 38 and 40 and also a Z-shaped bracing rod assembly 42 intermediate the brace members 38 and 40. The uprights 36 are also of tubular construction and their upper ends define recesses (not shown) similar to the recesses 34 while their lower ends have smaller dimensional extensions 44 secured therein whose outer ends are telescoped into the recesses 34. Further, the uprights 36 each include a plurality of vertically spaced and inwardly projecting anchor pins 46 whose purpose will be hereinafter apparent.

The upper terminal end section 22 comprises an elongated angle member 48 having an apertured anchoring lug 50 secured thereto intermediate its opposite ends. In addition, the opposite ends of the angle member 48 have depending projections 52 secured thereto corresponding to the extensions 44 and telescopically receivable in the open upper ends of the tubular uprights 36.

The vertically adjustable section includes a pair of upright channel members 56 whose web portions are slotted as at 58 and the lower ends of the channel members 56 are interconnected by means of a pair of tubular members 60 extending between and secured to opposite sides of the channel members 56 in any convenient manner such as by welding 62. In addition, the upper ends of the channel members 56 are interconnected by means of an upper transversely extending brace plate 64 and a workmen supporting section support frame generally referred to by the reference numeral 66 is also supported from the upper ends of the channel members 56. The support frame 66 includes a pair of opposite end angle members 68 which are secured to the brace plate 64 and a pair of supporting plates 70 carried by the upper ends of the channel members 56 on the sides thereof remote from the brace plate 64. In addition, the frame 66 includes a pair of opposite side angle members 72 which are secured between corresponding ends of the angle mem-

bers 68 and a plurality of upstanding platform section retaining plates 74 are secured to the four corners of the support frame 66. Finally, an apertured mounting lug 76 is secured to the brace plate 64 centrally intermediate its opposite ends for a purpose to be hereinafter set forth.

The pairs of corresponding ends of the tubular members 60 project beyond the adjacent channel members 56 and have a pair of pivotable support arms generally referred to by the reference numerals 78 pivotally secured thereto. The support arms 78 each include generally U-shaped frames including a pair of legs 80 and 82 interconnected at one pair of ends by means of an angle member 84 centrally apertured as at 86 and the legs 80 and 82 of each arm member 84 embracingly receive therebetween the corresponding pair of extended end portions of the tubular members 60 and are pivotally secured thereto by means of suitable pivot fasteners 88 for swinging movement between the generally horizontally disposed positions of the support arms 78 illustrated in FIGURES 1-4 of the drawings and upstanding substantially vertical positions such as that illustrated in FIGURE 10 of the drawings. Of course, the vertically adjustable section 24 slidably and guidingly receives the intermediate section 20 between the opposing channel members 56 and it will be noted that the vertically adjustable section 24 may be lowered into contact with the ground supporting the lower base section 18 inasmuch as the inclined brace members 30 may be slidably received in the slots 58 formed in the channel members 56 when the vertically adjustable section 24 is fully lowered.

The uprights 36 are each provided with a plurality of vertically spaced openings 90 in which a spring-urged detent lever 92 carried by the corresponding channel member 56 is engageable. Of course, the detent levers 92 are in communication with the uprights 36 through the slots 58 formed in the channel members 56.

A pair of the standard assemblies 12 may be erected in spaced relation in the manner illustrated in FIGURE 1 of the drawings. Thereafter, two pairs of inclined and crossed brace members 96 may be suitably connected between the pins 46 carried by the uprights 36 of the standard assemblies 12. The brace members 96 each comprise angle members and the opposite ends of each of the angle members has a sleeve 98 secured thereto in any convenient manner such as by welding 100. Of course, the angle members 96 are provided with bores 102 in alignment with the sleeves 98 and therefore, each of the ends of the brace members 96 may be engaged with a corresponding pin 46 and after the brace members 96 have been engaged with the pins 46, suitable retaining members in the form of cotter pins 104 may be passed through suitable bores 106 provided therefor in the pins 46 to releasably retain the brace members 96 on the pins 46. Accordingly, a pair of the standard assemblies 12 may be readily erected in proper position relative to each other and suitably cross braced.

Each of the vertically adjustable sections 24 has a winch assembly generally referred to by the reference numeral 110 secured to its apertured mounting lug 76 and each winch assembly 110 includes a winding member 112 upon which an elongated tension member 114 is partially wound, the free end of each tension member 114 being suitably connected to the apertured mounting lug 50 carried by the corresponding upper terminal end section 22. Accordingly, it may be seen that each of the vertically adjustable sections 24 may be readily adjusted in elevation. Of course, inasmuch as the detent levers 92 are spring-urged to the position thereof illustrated in FIGURE 12 by means of suitable springs 116, the detent levers 92 are operative to prevent downward movement of the vertically adjustable sections 24. However, each of the detent levers 92 is provided with an opening 118 which is registrable with a corresponding opening 120 formed in the bracket on the corresponding channel member 56 from which the detent lever 92 is pivotally supported and

a suitable lockpin (not shown) may be passed through each pair of aligned openings 118 and 120 to retain the detent levers 92 in inoperative positions whenever desired.

After the standard assemblies 12 have been erected and suitably interconnected by means of the brace members 96, the boards 122 defining the workmen supporting section 14 may be disposed on the support frames 66 in the manner illustrated in FIGURE 1 of the drawings. Thereafter, the boards 124 of each of the workmen supporting sections 16 may be supported from the corresponding support arms 78 in the manner illustrated in FIGURE 1 of the drawings after the support arms 78 have been pivoted to the horizontally disposed operative positions, the inner ends of the legs 80 and 82 including angle members 125 abuttingly engageable with the tubular members 60 so as to define limit positions of movement of the arms 78 to their operative positions. The openings or apertures 86 in the angle members 84 are registrable with openings formed through bracket members 126 carried by the corresponding channel members 56 and locking pins 128 may be passed through each of the pairs of registrable openings to retain the support arms 78 in the upstanding inoperative position illustrated in FIGURE 10.

With attention now directed more specifically to FIGURE 7 of the drawings there may be seen a bracing assembly generally referred to by the reference numeral 130 which may be used to widely distribute the weight of the standard assemblies on their supporting surface and to also provide additional bracing against the standard assemblies being inclined relative to a vertical plane.

Each of the bracing assemblies 130 includes a pair of generally parallel opposite side members 132 consisting of a pair of end aligned and spaced apart end sections 134 secured together by means of a short intermediate bridging member or section 136 secured to each of the opposite end sections 134 in any convenient manner such as by welding 138. The opposite side members 132 each include a pair of opposite end inclined braces 140 pivotally secured to the remote ends of each pair of corresponding end sections 134 as at 142. The free ends of the inclined braces 140 have sleeves 144 secured thereto and the sleeves 144 are receivable on the lowermost pins 46 carried by the corresponding uprights 36, cotter pins 146 being provided and receivable through suitable bores 148 provided therefor in the outer ends of the lowermost pins 46 to retain the sleeves 144 on the pins 46.

The opposite ends of the opposite side members 132 are interconnected by means of transverse angle members 150 each pivotally secured to one of the opposite side members 132 as at 152 and having a pin 154 on its free end receivable through an aperture 156 provided therefor in a bracket 158 secured to the other opposite side member 132. Accordingly, the brace assemblies 130 may be readily collapsed into a compact state with the inclined braces 140 generally paralleling the opposite side members 132 and the latter spaced closely adjacent each other after the transverse brace members 150 have been pivoted to positions generally paralleling the opposite side members 132 to which they are pivotally secured. Of course, the base member 26 of an associated standard assembly 12 is embracingly received between the adjacent ends of each pair of end sections 134 when the bracing assembly 130 is utilized in conjunction with that standard assembly 12.

With attention now invited more specifically to FIGURES 13-16 of the drawings, there will be seen a prestressed workmen supporting section generally referred to by the reference numeral 160 and which may be of a length at least twice the lengths of the workmen supporting sections 14 and 16. The workmen supporting section 160, as an example, may be 16 or more feet long and therefore a scaffolding of a given length utilizing the workmen supporting sections 160 in lieu of the workmen supporting sections 14 and 16 does not require as many

standard assemblies 12 inasmuch as the latter will be spaced considerably further apart.

Each of the sections 160 includes first and second boards 162 and 164. Each of the boards 164 has an anchoring plate 166 secured thereto adjacent one end by means of fasteners 168 and an end edge embracing channel member 170 secured to its other end. The channel member 170 has a pair of depending angle members 172 secured to its opposite ends and an angle member 174 is secured between the lower ends of the angle members 172. An inclined tension rod 176 is secured at one end to the angle member 174 intermediate its opposite ends and to the anchor plate 166 at its other end. Further, the angle members 172 are suitably apertured adjacent their upper ends as at 178.

The boards 162 each have an anchor plate 180 similar to the anchor plate 166 secured to one end by means of suitable fasteners 182 and an end edge embracing channel member 184 is secured to the other end of each board 162 which is similar to the channel member 170. However, the channel member 184 has its opposite ends closed by means of mounting plates 186 secured thereover and including apertured end portions 188 projecting outwardly beyond the corresponding end of the board 162.

The apertured end portions 188 are registrable with the apertures 178 and suitable fasteners 190 are secured therethrough. In addition, a tension rod 192 has one end secured to the anchor plate 180 and the other end is externally threaded as at 194 and is passed through a suitable bore 196 provided therefor in the angle member 174. Then, a threaded fastener 198 is threadably engaged with the free end of the tension rod 192 securing it through the aperture 196, a second threaded fastener 200 being already threaded on the tension rod 192 and thereby serving as a jamnut.

Of course, any tendency of the center of the workmen supporting section 160 to bow downwardly is resisted by the inclined tension rods 176 and 192. Therefore, the workmen supporting section 160 may be of much greater length than the workmen supporting sections 14 and 16. Accordingly, when the workmen supporting sections 160 are utilized, a fewer number of standard assemblies 12 are needed.

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 scaffold with elevatable section, said scaffold including a pair of upright standard assemblies each including an elevatable section thereon, an elongated horizontal workmen supporting section extending between and having its opposite ends supported from said elevatable sections, said elevatable sections including elongated arm members pivotally secured thereto at one pair of corresponding ends of said arm members for rotation about axes extending transversely of said arm members and generally longitudinally of said workmen supporting section for movement between operative generally horizontally disposed positions projecting transversely of said workmen supporting section and collapsed positions extending along the corresponding sides of the associated standard assemblies, the opposite ends of said workmen supporting section being supported from said arm members, said elevatable sections each including a pair of parallel spaced apart elongated horizontal members between pairs of corresponding ends of which one pair of corresponding ends of a pair of oppositely facing, parallel and upstanding channel members are secured, said assemblies each including a pair of interconnected parallel uprights em-

bracingly and slidably engaged by said channel members, said elongated horizontal members including terminal end portions projecting outwardly beyond remote sides of said channel members, said arm members each including a pair of parallel spaced apart legs including one set of corresponding base end portions receiving therebetween and pivotally secured to the terminal end portions of the corresponding terminal ends of said elongated horizontal members for oscillation about a horizontal axis extending transversely of said legs and said horizontal members and spaced from the terminal ends of said base end portions, the terminal ends of said base end portions of each pair of legs including horizontally outwardly projecting abutment members extending toward each other, spaced apart at their free ends and abuttingly engaged with the undersurfaces of the adjacent elongated horizontal members when said legs are horizontally disposed with their ends remote from the base end portion thereof projecting outwardly from and forming continuations of the adjacent ends of said horizontal members.

2. The combination of claim 1 including a second elongated horizontal workmen supporting section having its opposite ends supported from said elevatable sections with the longitudinal centerline of said second workmen supporting section being disposed in a vertical plane passing through the centers of said standard assemblies.

3. The combination of claim 2 wherein said second workmen supporting section is elevated above the first mentioned workmen supporting section.

4. The combination of claim 3 wherein each of said elevatable sections includes a second arm member corresponding to the first mentioned arm members and pivotally secured to said elevatable section for movement between a horizontal position projecting outwardly of the opposite side of the corresponding upright standard and a collapsed position extending along said opposite side of the corresponding standard assembly, said second arm members being generally horizontally aligned with the first mentioned arm members, and a third workmen supporting section extending between and having its opposite ends supported from said second arm members.

5. The combination of claim 1 wherein said elevatable sections include releasable lock means operative to positively lock said elevatable sections in adjusted elevated position on said standard assemblies against downward movement therealong.

6. The combination of claim 1 wherein said workmen supporting section includes opposite end portions defined on opposite sides of a point centrally intermediate the opposite ends of said workmen supporting section, a depending brace member supported from said workmen supporting section adjacent said point, and elongated tension members secured to the lower end portion of said brace member at one pair of corresponding ends and inclining upwardly toward and secured to the opposite ends of said workmen supporting section at the other pair of corresponding ends whereby said workmen supporting section is in the form of a truss member capable of supporting appreciable weight in the center portion thereof without being longitudinally bowed.

7. The combination of claim 6 wherein said opposite end portions comprise separate end aligned end sections removably joined together at adjacent ends, said depending brace member being carried by one of said adjacent ends.

8. A scaffold with elevatable section, said scaffold including a pair of upright standard assemblies each including an elevatable section thereon, an elongated horizontal workmen supporting section extending between and having its opposite ends supported from said elevatable sections, each of said upright standard including a base section and an upper section, said base section including an elongated base member, a pair of vertically short up-

standing uprights secured to said base member at points spaced longitudinally therealong intermediate its opposite ends, said upper section including a pair of upstanding generally parallel uprights, the lower ends of the uprights of the upper section and the upper ends of the uprights of the base section including removably telescopically engaged portions securing said upper section to said base section, said base section including a pair of inclined brace members secured between the upper ends of the uprights of the base section and the adjacent ends of the elongated brace member of the base section, said elevatable section including a pair of upstanding channel members opening toward each other and interconnected by means of upper and lower transverse members secured between corresponding opposite sides of said channel members, said elevatable section being slidably disposed on said upper section with the uprights of the latter slidably received in said channel members, the lower end portions of said channel members including longitudinally extending slots opening downwardly, said brace members of said base section being receivable in the slots formed in said channel members when said elevatable section is fully lowered.

9. An upright standard adapted to be utilized in pairs and to have an elongated horizontally disposed workmen supporting section supported therefrom at one end with the other end of the workmen supporting section being supported from another standard, said upright standard including a base section and an upper section, said base section including an elongated base member, a pair of vertically short upstanding uprights secured to said base member at points spaced longitudinally therealong intermediate its opposite ends, said upper section including a pair of upstanding generally parallel uprights, the lower ends of the uprights of the upper section and the upper ends of the uprights of the base section including removably telescopically engaged portions securing said upper section to said base section, said base section including a pair of inclined brace members secured between the upper ends of the uprights of the base section and the adjacent ends of the elongated brace member of the base section, an elevatable section mounted on said upper section for guided movement therealong and adapted to have the corresponding end of said workmen supporting section supported therefrom, said elevatable section including a pair of upstanding channel members opening toward each other and interconnected by means of upper and lower transverse members secured between corresponding opposite sides of said channel members, said elevatable section being slidably disposed on said upper section with the uprights of the latter slidably received in said channel members, said channel members including longitudinally extending slots opening downwardly, said brace members of said base section being receivable in the slots formed in said channel members when said elevatable section is fully lowered.

References Cited

UNITED STATES PATENTS

Re. 24,100	12/1955	Solomon et al.	182—132
657,396	9/1900	Curley	182—132
1,415,554	5/1922	Hatch	182—222
2,415,461	2/1947	Causey	182—222
2,582,625	1/1952	Dunn	182—145
2,904,126	9/1959	Meng et al.	182—132
3,083,787	4/1963	Isbell	182—146
3,323,616	6/1967	Best	182—146

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U.S. Cl. X.R.

182—146, 222