July 21, 1942. G. W. CAVINS 2,290,535

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Fig. 1.

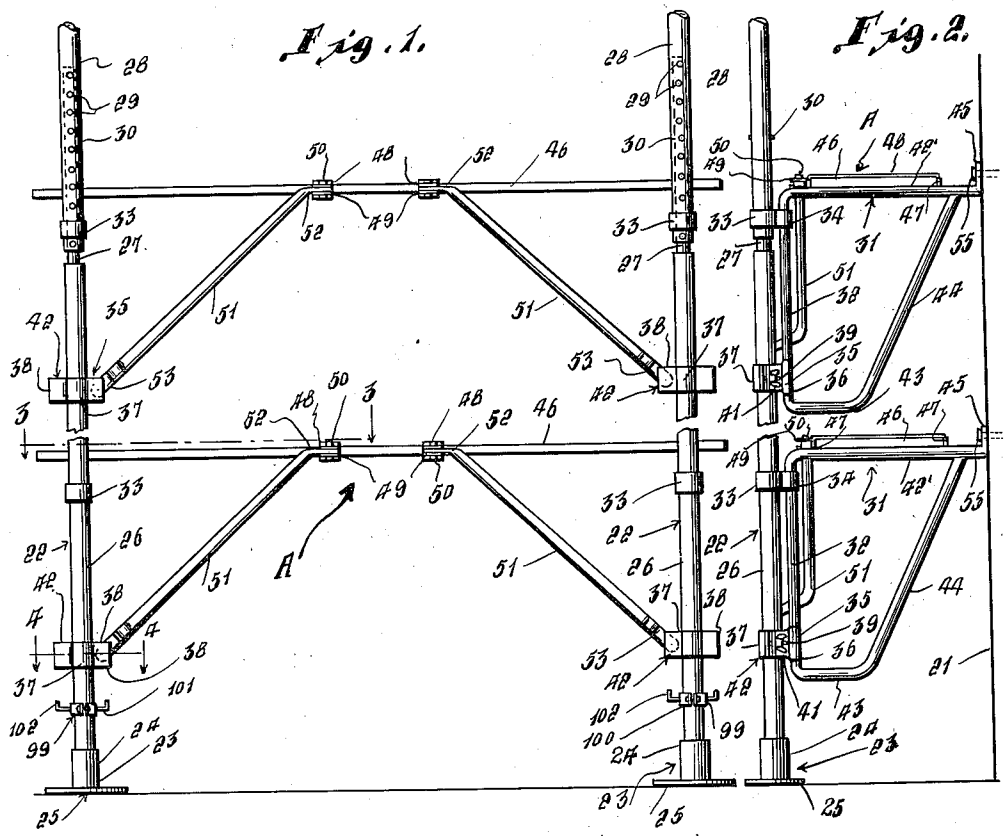


Fig. 2.

Fig. 3.

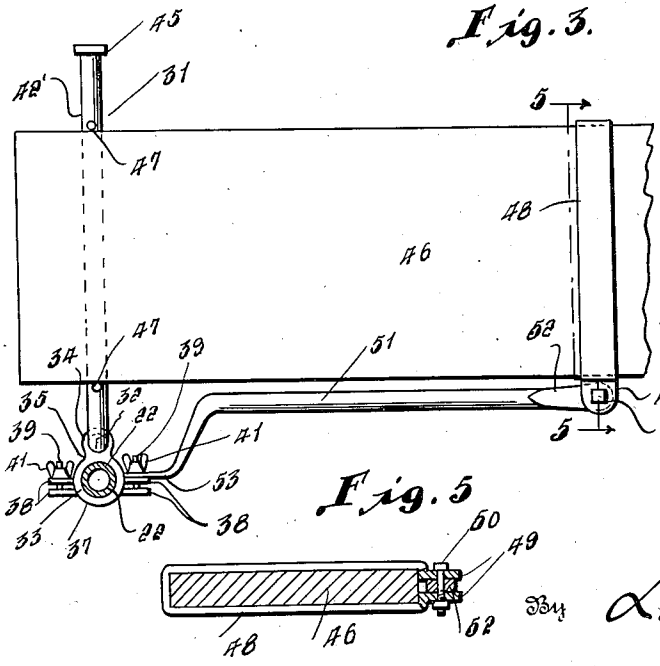


Fig. 4.

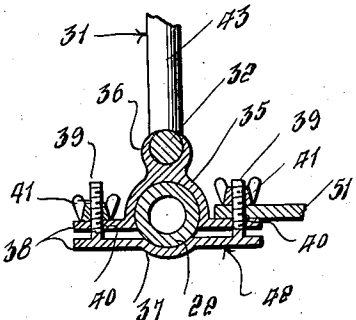


Fig. 5

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Fig. 6.

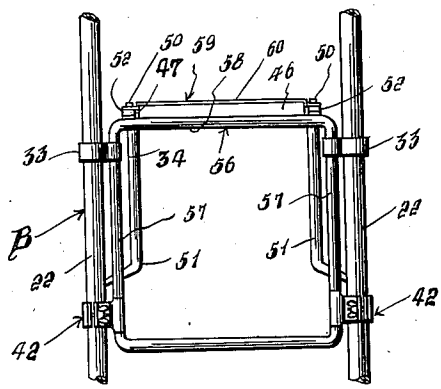


Fig. 9.

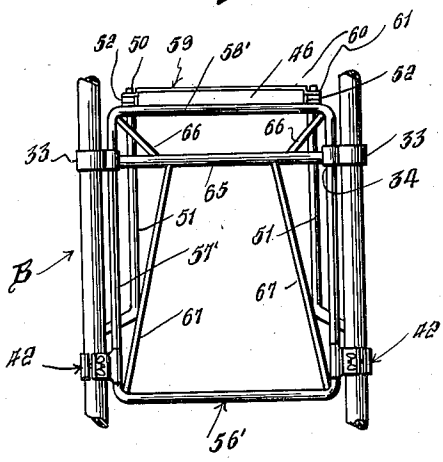


Fig. 7.

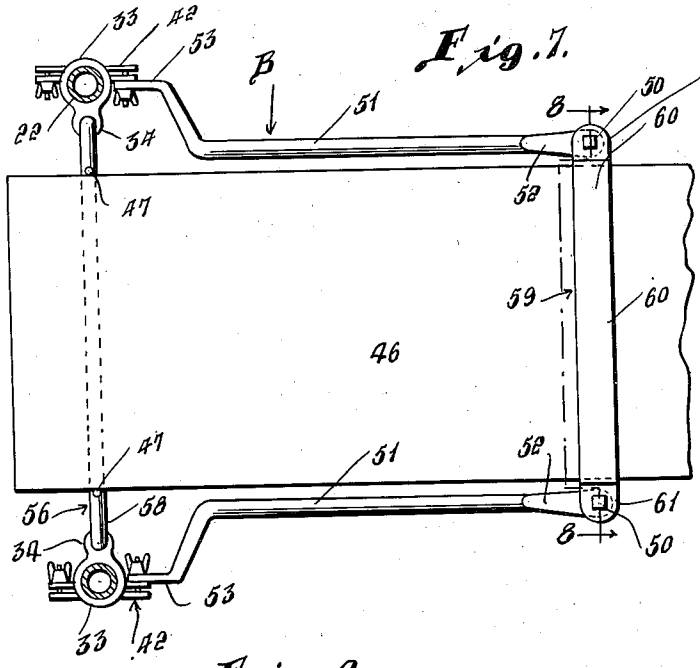


Fig. 10.

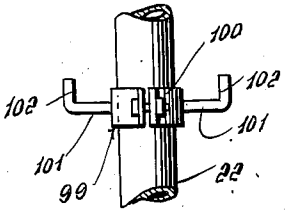


Fig. 11.

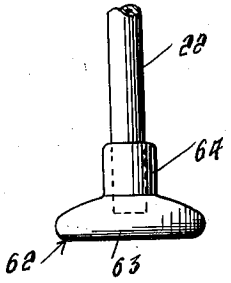
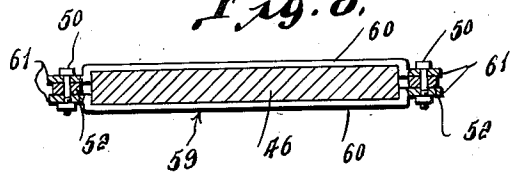


Fig. 8.



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Fig. 12.

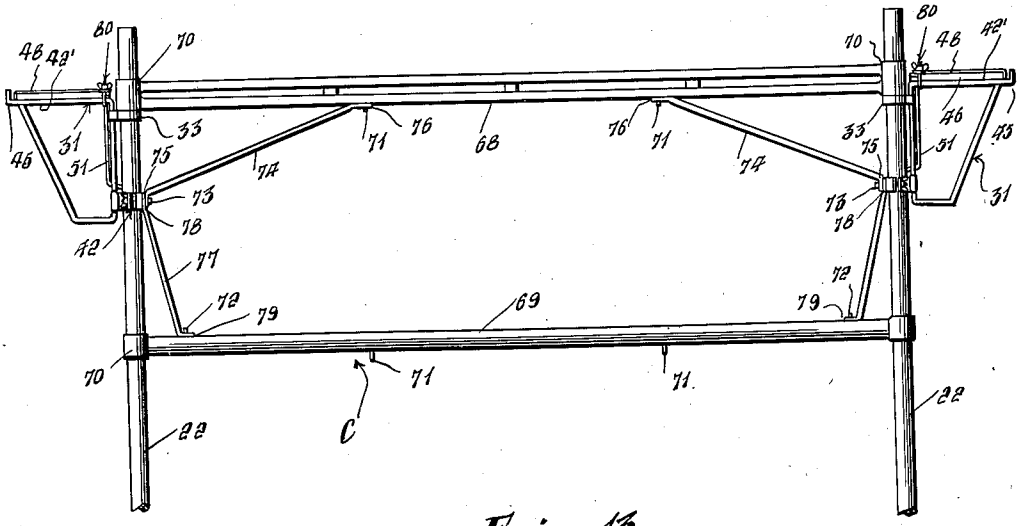


Fig. 13.

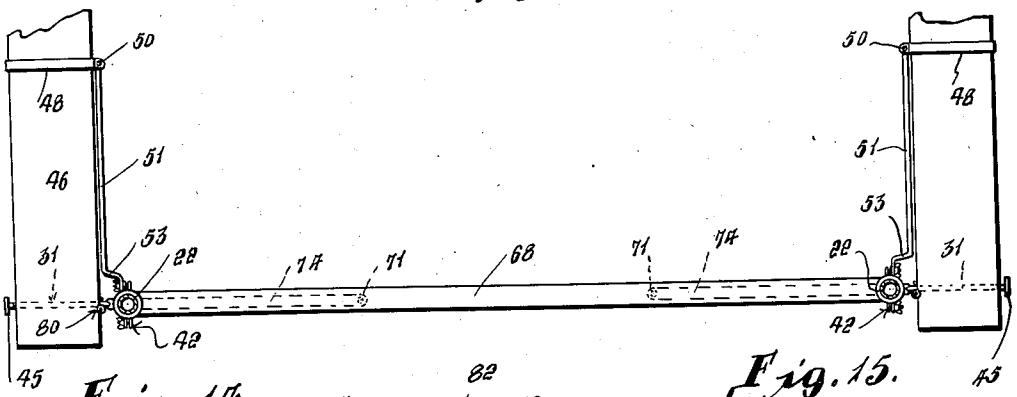


Fig. 14.

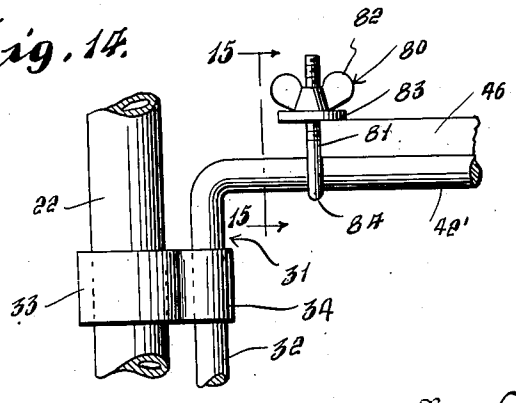
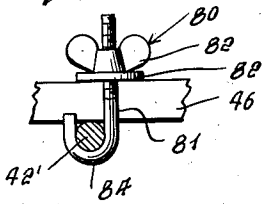


Fig. 15.



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Fig. 16.

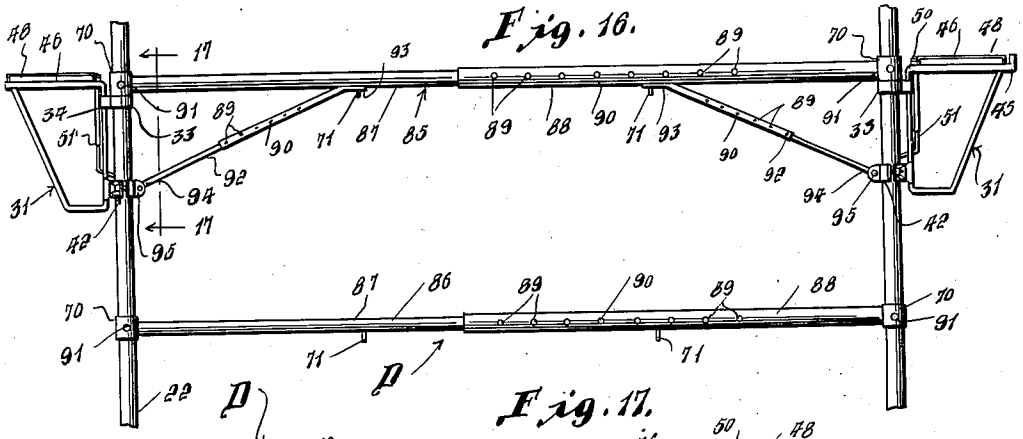


Fig. 17.

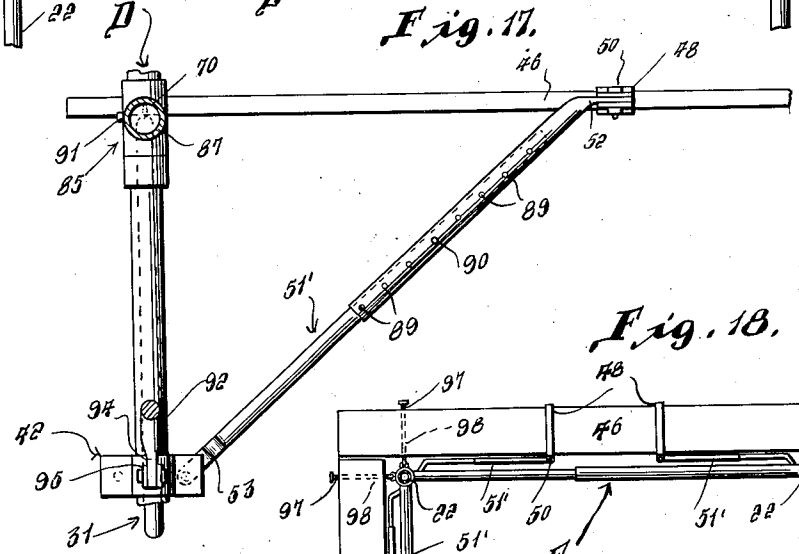


Fig. 18.

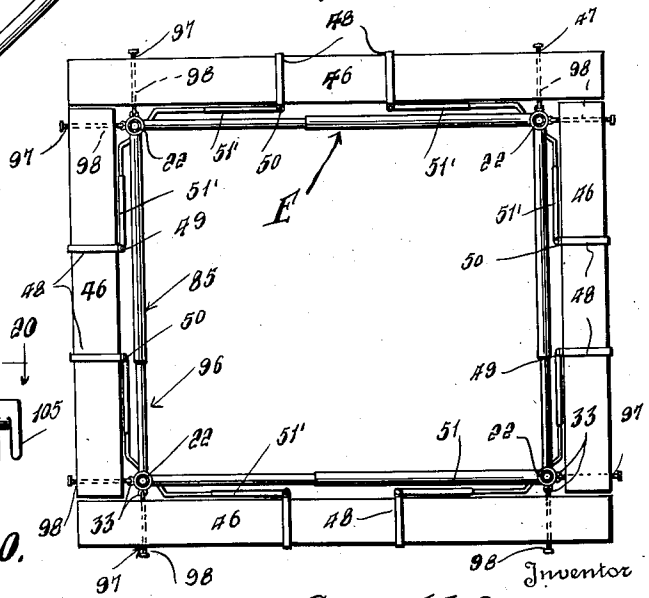


Fig. 19.

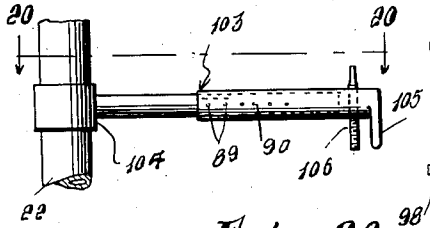
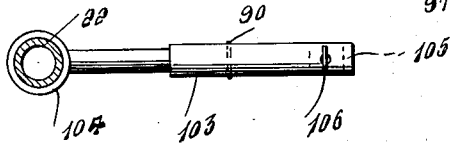


Fig. 20.



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2,290,535

UNITED STATES PATENT OFFICE

2,290,535

SCAFFOLD

George W. Cavins, Milwaukee, Wis.

Application April 3, 1941, Serial No. 386,721

8 Claims. (Cl. 304—10)

This invention relates to an improved scaffold construction and more particularly to a scaffold which may be used for either inside or outside work and which may be arranged to be either self-supporting or which may be readily attached to an upright surface, in conjunction with which the scaffold is to be used, and supported in an upright position by said surface.

More particularly, it is an aim of the invention to provide a scaffold which may be quickly and easily assembled, which includes posts formed of extensible sections, and which is provided with brackets for supporting planks or flooring said brackets being adjustable relatively to the posts for adjusting the elevation of the planks or flooring.

Still a further aim of the invention is to provide improved means for adjustably and detachably securing the plank supporting brackets to the posts, and novel means for detachably and adjustably retaining a plank in engagement with said brackets.

Still a further aim of the invention is to provide a self-supporting scaffold including pairs of spaced uprights, the uprights of each of said pairs being connected by bracket members, which form means for connecting the uprights of the pairs and also means for supporting an end of a plank or flooring between each pair of said uprights.

Still a further aim of the invention is to provide means for bracing the intermediate portion of the plank or flooring and for securely positioning the plank or flooring relatively to the supporting brackets.

Still a further aim of the invention is to provide steps having clamping means for detachably and adjustably engaging the uprights of the scaffold by means of which workmen may safely and easily climb the scaffold for reaching a plank or flooring supported thereby.

Still another object of the invention is to provide a scaffold including a substantially rectangular scaffold frame formed of upright corner posts connected by horizontal braces, said braces being formed of telescoping sections and being provided with means for connecting the sections in a plurality of adjusted positions for varying the size of the scaffold.

Still a further aim of the invention is to provide novel means for attaching the scaffold to a wall or other upright surface to provide means for maintaining the scaffold in an upright position.

Other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, which illustrates preferred embodiments of the invention, and wherein:

Figure 1 is a side elevational view of one form of the scaffold,

Figure 2 is an end view in elevation of the same,

Figure 3 is an enlarged fragmentary horizontal sectional view taken substantially along the plane of the line 3—3 of Figure 1,

Figure 4 is a similar view taken substantially along the plane of the line 4—4 of Figure 1,

Figure 5 is a cross sectional view taken substantially along the plane of the line 5—5 of Figure 3,

Figure 6 is a fragmentary end view in elevation of another form of the scaffold,

Figure 7 is a fragmentary top plan view of the same,

Figure 8 is a cross sectional view taken substantially along the plane of the line 8—8 of Figure 7,

Figure 9 is a view similar to Figure 6, of another form of the scaffold, constituting a modification of the form shown in Figure 6,

Figure 10 is a fragmentary side elevational view of one of the steps for climbing the scaffold,

Figure 11 is a fragmentary side elevational view of the lower end of one of the uprights,

Figure 12 is a fragmentary side elevational view of another form of the invention,

Figure 13 is a fragmentary top plan view of the form of the invention shown in Figure 12,

Figure 14 is an enlarged fragmentary side elevational view of a portion of one of the brackets shown in Figures 12 and 13,

Figure 15 is a sectional view taken substantially along the plane of the line 15—15 of Figure 14.

Figure 16 is a view similar to Figure 12 of another form of the invention,

Figure 17 is a sectional view, on an enlarged scale, taken substantially along the plane of the line 17—17 of Figure 16,

Figure 18 is a top plan view of still another form of the scaffold,

Figure 19 is a side elevational view showing means for attaching the scaffold to a piece of spouting, and

Figure 20 is a horizontal sectional view taken substantially along the plane of the line 20—20 of Figure 19.

Referring more particularly to the drawings, wherein like reference characters designate like

or corresponding parts throughout the different views, and referring particularly to Figures 1 to 5, A designates generally a scaffold which is adapted to be attached to an upright surface or wall 21, as seen in Figure 2, and which includes a pair of upright standards or posts 22 which are mounted in base plates 23, at their lower ends. The base plates 23 each include an upright socket portion 24 for receiving the lower end of a post 22 and an annular flange portion 25 which is adapted to rest on the supporting surface for the scaffold A. The posts or standards 22 are each formed of telescoping sections including a lower section 26 having a restricted upper end 27 on which is telescoped the lower end of an upper section 28 which is of substantially the same diameter as the lower portion of the section 26. The section 28 is provided with a plurality of longitudinally spaced openings 29 which are adapted to be arranged to register with corresponding openings, not shown, in the portion 27 for receiving a pin or stud 30 for adjustably connecting the sections 26 and 28. It will thus be seen that the length or height of the posts or standards 22 may be readily varied.

A bracket, designated generally 31, is adapted to be adjustably and detachably mounted on each of the posts 22 or a plurality of superimposed brackets 31, as illustrated in Figures 1 and 2, may be mounted on each post 22. Each of the brackets 31 includes an upright portion 32 which is adapted to be disposed substantially parallel to the post 22, on which said bracket 31 is mounted, and which is provided adjacent its upper end with a sleeve 33 which is fixedly secured to the portion 32 by an extension 34 and which is adapted to slidably engage the post 22. The portion 32, adjacent its lower end, is provided with a clamp portion 35 having an arcuately shaped intermediate portion for engaging partially around the post 22 and an extension or ear 36 which projects from the outer side of said intermediate portion and which is fixedly secured to the portion 32. A strap section 37 is adapted to cooperate with the clamp portion 35 for engaging the opposite side of the post 22 and the members 35 and 37 are provided with outwardly projecting ears 38. The ears 38 of the member 37 are provided with laterally projecting bolts 39 which extend through apertures 40 in the ears 38 of the member 35 and which are provided with wing nuts 41 for clamping the members 35 and 37 together and to the post 22 and which parts combine to form a clamp, designated generally 42, as best seen in Figure 4. The bracket 31 includes an upper, substantially horizontal portion 42' which is formed integral with and which projects outwardly from the upper end of the portion 32. A portion 43 projects outwardly from the lower end of the portion 32 and said portion 43, at its outer end, is formed integral with a brace portion 44 which extends upwardly and outwardly relatively to the portion 43 and which is formed integral at its opposite end with the upper, horizontal portion 42', adjacent the free end thereof. The free end of the portion 42', which extends beyond the brace 44 terminates in an upset eye 45. From the foregoing it will be obvious that one or more brackets 31 may be adjustably and detachably mounted on each of the posts 22. The portions 42' of the brackets 31 which are arranged at corresponding levels on the posts 22 form supports for the ends of planks or flooring 46 and, as best seen in Figure 3, the portions 42' are provided with upstanding studs 47 for engaging the side edges of the ends of the planks 46 for preventing lateral movement of the planks relatively to the brackets 31.

A pair of metal straps 48 are detachably disposed around the planks 46, intermediate of their ends, and are provided with apertured ends 49 which are offset toward one another and which are connected by fastenings 50, which fastenings may be tightened for clamping the straps 48 to the planks 46. A brace 51 is provided with an apertured end 52 which is connected to each of the straps 48 by a fastening 50 to thereby connect a brace 51 to each of said strap members 48. The braces 51 are each provided with an opposite outwardly offset apertured end 53. Each of the apertured ends 53 is adapted to be connected to a bolt 39 of one of the clamp members 42 by its nut 41 so that the braces 51 are arranged diagonally to the posts 22 and the planks 46, as best seen in Figure 1, for bracing the intermediate portions of the planks 46 and for providing additional means for fixedly positioning the ends of the planks 46 relatively to the brackets 31 on which they are supported.

From the foregoing it will be obvious that the length of the scaffold A may obviously be varied depending upon the length of the planks or flooring 46 which are employed and by providing each of the posts 22 with a plurality of spaced brackets 31 a plurality of spaced superposed work supporting surfaces may be afforded by the flooring or planks 46, the levels of which may be varied as required by raising and lowering the brackets 31. Furthermore, it will be apparent that it will not be necessary that the posts 22 be supported on a level surface or that their bases 23 be at the same level as the complementary brackets 31 may obviously be adjustably positioned relatively to one another to maintain the planks or flooring 46 substantially level. After the scaffold A has been completely assembled and the planks or flooring 46 arranged at the desired levels, fastenings 54 are passed through the eyes 45 and driven into the surface 21 for securing the scaffold A relatively thereto.

In Figures 6 to 8, a modified construction of scaffold, designated generally B, is illustrated. The scaffold B is of a self-supporting type and is especially adapted for use in indoor work or for working on brick or stone walls where it is not practical to secure a scaffold to the wall or upright surface on which work is to be performed. The scaffold B is therefore provided with a pair of spaced upright standards or posts 22 at each end thereof between each of which pairs of posts is disposed a substantially rectangular bracket 56. Each bracket 56 is provided with corresponding substantially upright side portions 57 which are arranged adjacent to and substantially parallel with the posts 22. Each of the portions 57 is provided with a sleeve 33 at its upper end and a clamp 42 at its lower end providing means for adjustably and detachably securing the brackets 56 to the pairs of posts 22. The brackets 56 are each provided with an upper horizontal portion 58 forming a support for an end of a plank 46. As best seen in Figure 7, the portion 58 is provided with upstanding studs 47 for engaging the side edges of the plank 46 for preventing the plank from moving laterally of the bracket 56.

A clamp 59 is secured to the plank 46, intermediate of its ends, and includes a pair of corresponding strap members 60, which are disposed transversely of the plank 46, with one of said strap members above and the other beneath the plank. The strap members 60 are provided with offset ends 61, which are disposed beyond the side edges of the plank 46 and which are offset so that the complementary ends 61 of the strap members 60 are offset relatively to one another. Said ends are apertured to receive fastenings 50 by means of which the clamp 59 is releasably secured to the plank 46. A brace 51 is attached to a bolt 39 of each of the clamps 42 of the brackets 56 at its end 53. The opposite ends 52 of the braces 51 are attached to the fastenings 50 of the clamp 59 to provide means in conjunction with the clamp 59 for bracing the intermediate portion of the plank 46 and for holding the plank relatively to the bracket 56. It is to be understood that only one end of the scaffold B has been disclosed and that the parts thereof constituting the opposite end will be identical with the parts of the illustrated end for supporting the opposite end of the plank 46 of the scaffold B.

Where the scaffold B is used for indoor work, in order to prevent the scaffold from marring the surface on which it is supported, the base members 23 are replaced by base members 62, as illustrated in Figure 11, of rubber or other similar material which will not mar a floor, for example, and which will afford a frictional engagement therewith to prevent the scaffold from sliding relatively to such surfaces. The base member 62 includes an enlarged foot portion 63 and an upstanding upwardly opening socket portion 64 for receiving the lower end of a post or standard 22, and it will be understood that each of the posts 22 will be equipped with a foot member or base member 62.

In Figure 9, the scaffold B is shown provided with a modified bracket 56' including the upright side portions 57' which carry sleeves and clamps 33 and 42, respectively, and an upper portion 58' which forms a support for an end of the plank 46. The bracket 56' is also provided with a horizontal brace 65 which is disposed beneath and adjacent the portion 58'. Upwardly and outwardly projecting diagonal braces 66 extend from the brace 65 to the ends of the horizontal portion 58' and downwardly and outwardly projecting diagonal braces 67 extend from the brace 65 to the lower ends of the portions 57'.

In Figures 12 and 13, another form of scaffold, designated generally C, is illustrated. The scaffold C is provided with four upright corner posts or standards 22, two of which are shown, and the corner posts of each end of the scaffold C are connected by a brace 68 and a brace 69. Braces 68 and 69 are provided with transverse sleeves 70 at their ends for slidably engaging the posts 22. A bracket 31 is attached to each of the posts 22, in the manner as previously described, and the brackets 31 are disposed with their sleeves 33 and clamps 42 beneath the sleeves 70 of the braces 68 and above the sleeves 70 of the braces 69. The brackets 31 project from the posts 22 in the opposite direction to the braces 68 and 69 and, as illustrated in Figure 13, the two brackets 31 on the two end posts 22 which are illustrated, each support an end of a plank 46 and are each provided with a brace 51 and a strap clamp 48 for bracing the intermediate portions of the planks 46 and for holding the planks in fixed positions relatively to the brackets 31. It will be understood that the opposite end of the scaffold C includes a pair of corner posts 22 and brackets 31, which corner posts are provided with the braces 68 and 69 and which brackets 31 are attached in the same manner to the posts to similarly support the opposite ends of the planks 46. It will furthermore be apparent that the length of the scaffold C may vary depending upon the length of the planks 46. As seen in Figure 12, the braces 68 and 69 are provided, intermediate of their ends, with spaced depending studs 71 and the brace 69 is provided, adjacent its ends, with upstanding fastenings 72. The clamps 42 are provided with bolt fastenings 73 which project from the outer sides of the portions 37. A pair of diagonal braces 74 are each provided with an angularly disposed apertured end 75 for engaging a fastening 73. Braces 74 project inwardly and upwardly from the fastenings 73 and are provided with opposite angularly disposed apertured ends 76 which bear against the underside of the brace 68 and which engage the studs 71. As seen in Figure 12, the sleeves 70 of the brace 68 rest on the sleeves 33 of the brackets 31 so that the brace 68 is supported by the brackets 31 and by the diagonal braces 74. A pair of diagonal braces 77 are each provided with an angularly disposed apertured end 78 which is connected to a fastening 73. Braces 77 extend downwardly and inwardly from the fastenings 73 and are provided with opposite angularly disposed ends 79 which are attached to the fastenings 72 for supporting the brace 69. The studs 71 of the brace 69 are provided so that additional planks 46 may be supported by the scaffold C, beneath the planks 46 which are illustrated, in which case the ends 76 of braces 74, not shown, would be connected to the studs 71 of the brace 69. It will be apparent that the scaffold C is adapted to be used for supporting workmen on opposite sides thereof, as for example where work is being performed on two opposed upright surfaces or walls.

The brackets 31 of the scaffold C are shown provided with fastening means 80, in lieu of the studs 47 for securing the ends of the planks 46 to the supporting portions 42', as best illustrated in Figures 14 and 15. The fastening means 80 each includes a bolt 81 having a threaded end for receiving a wing nut 82 and a washer 83 which is disposed therebeneath. The opposite end of the bolt 81 is bent to form a hook 84 for engaging around the underside of a supporting portion 42'. The bolt 81 is disposed against a side edge of a plank 46 and the washer 83 rests on the upper surface of the plank 46 and is pressed thereagainst by tightening of the nut 82 for clamping the plank 46 between the supporting member 42' and the washer 83. It will be obvious that the fastening means 80 may be used in lieu of the studs 47 with the brackets of each of the scaffolds.

Referring to Figures 16 and 17, a scaffold, designated generally D is similar to the scaffold C and differs therefrom in that the braces 85 and 86, which replace the braces 68 and 69, are each formed of telescoping sections 87 and 88. The inner sections 87 of the braces 85 and 86 telescope into the tubular outer sections 88, and the sections 88 of the braces 85 and 86 are provided with longitudinally spaced openings 89 which are adapted to register with similarly arranged openings or recesses, not shown, in the sections 87 for receiving pins or other connecting means 90

for holding the sections 87 and 88 of the braces 85 and 86 in a plurality of adjusted positions. The remote ends of the sections 87 and 88 are provided with sleeves 70 for slidably engaging the posts 22 and said sleeves 70 are also provided with set screws 91 for securing the sleeves 70 relatively to the posts 22 for supporting the braces 85 and 86 at various elevations. In lieu of the braces 74, the brace 85 is provided with diagonal braces 92 which are likewise formed of telescoping sections having means, corresponding to the means 89 and 90 for holding the sections of the braces 92 in adjusted positions. The adjacent ends 93 of the braces 92 engage depending studs 71 of the brace 85 and the opposite ends 94 are apertured to pivotally engage pins 95 which extend through ears 96 which project from the clamps 42 so that the braces 92 may be swung upwardly or downwardly and extended or retracted for bracing the brace 85 at various elevations relatively to the brackets 31, in which it may be disposed. The sleeves 70 of the lower brace 86 are also provided with set screws 91 for holding the brace 86 at any desired elevation relatively to the posts 22. As seen in Figure 17, the braces 51' of the scaffold D, which replace the braces 51, are likewise formed of telescoping sections having registering openings 89 for receiving pins 90 for holding the sections in adjusted positions to thereby provide means whereby planks 46 of different lengths may be braced adjacent their centers. As in the scaffold structure C, only one end of the scaffold D is illustrated and it will be understood that the opposite end is of a like construction.

In Figure 18, a scaffold, designated generally E is illustrated. The scaffold E includes a rectangular frame 96 formed of corner posts 22 and braces 85 and 86, the latter of which is not illustrated. In lieu of the brackets 31, the scaffold E is provided with double brackets 97 having corresponding bracket portions 98, each of which corresponds to a bracket 31. The pairs of bracket portions 98 are disposed substantially at right angles to one another and are connected to a sleeve 33 and a clamp 42, which is common to both bracket portions 98. The bracket portions 98 of each of the brackets 97 project outwardly, adjacent the sides of the frame 96 and at adjacent ends of said sides, as clearly illustrated in Figure 18. It will therefore be apparent that four planks 46 may be supported by the scaffold E in the form of a square for supporting workmen on four sides of the scaffold. The scaffold E also includes strap clamps 48 and braces 51' for bracing the intermediate portions of the planks 46 and for holding them in position relatively to the bracket portions 98. The bracket portions 98 may be provided with studs 47, not shown, for which, if desired, fastening means 80 may be substituted. It will be apparent that the braces 85 and 86 may be extended to accommodate the scaffold E for planks 46 of different lengths and to form a scaffold of different dimensions.

As previously stated the various scaffolds may each be extended to different elevations and in order to provide means whereby workmen may readily and safely climb the scaffolds to and from the planks or flooring 46, removable and adjustable steps 99, as best seen in Figure 10, are provided. The steps 99 each include a clamp portion 100 which is adapted to be detachably and adjustably clamped to a post or standard 22 and from which projects rods 101 having upturned free ends 102. The rods 101 form steps by means of a plurality of which the workmen may readily climb up to or down from the supporting planks or flooring 46.

In order to enable the scaffold A to be used for outdoor work and adjacent a surface to which the scaffold cannot be readily secured by the fastenings 55, as for example a brick wall, means are provided for fastening the upper ends of the posts 22 of the scaffold A to a piece of spouting or gutter of a building, not shown. Said means, as illustrated in Figures 19 and 20, include a rod formed of telescoping sections, designated generally 103 provided with means 89, 90 for holding the sections in adjusted positions relatively to one another. The remote end of one of the sections of the rod 103 is provided with a sleeve 104 which is adapted to slidably engage a post 22. The opposite, remote end of the other section of the rod 103 is provided with a downturned end 105 which is adapted to extend into the spouting or gutter. A set screw 106 extends downwardly through the rod 103, adjacent the end 105 to engage the outer side of the spouting or gutter to combine with the end 105 for detachably securing the rod 103 thereto and to thereby form means for holding the scaffold A in an upright position.

Various modifications and changes in the different embodiments of the invention which have been disclosed, are contemplated and may obviously be resorted to.

I claim as my invention:

1. A scaffold comprising spaced upright standards, brackets having sleeve portions and clamps for slidably engaging said standards, means to tighten said clamps for adjustably securing the brackets relatively to the standards, said brackets each having an upper supporting portion projecting from its standard, disposed substantially at a right angle thereto and forming a support for an end of a plank, brace members detachably and adjustably secured to said clamps, clamps detachably and adjustably connected to the plank, between said brackets, and means for detachably connecting said brace members to said last mentioned clamps for fixedly positioning the plank relatively to the supporting portions of said brackets, said brackets each including, in addition to said supporting portion, an upright portion depending from the inner end of a supporting portion and on which is mounted a sleeve portion and one of said first mentioned clamps, a lower or base portion projecting outwardly from the lower end of the upright portion, and a diagonal brace portion connecting the base portion and support portion, adjacent the free ends thereof.

2. A scaffold comprising corner posts, braces disposed at right angles to the posts and provided with sleeves at their ends for slidably engaging the posts, diagonal braces connecting said first mentioned braces and posts for supporting said first mentioned braces relatively to the posts, said braces and posts combining to form a rectangular scaffold frame structure, pairs of brackets projecting outwardly from each of said posts and relatively to the frame structure, the brackets of each of said pairs being disposed at right angles to one another, means for slidably and adjustably securing said pairs of brackets to the posts, and planks supported at their ends on said brackets.

3. A scaffold structure as in claim 2, said first mentioned braces being formed of telescoping sec-

tions and having means for securing said sections in adjusted positions relatively to one another.

4. A scaffold comprising pairs of spaced upright posts or standards, the standards or posts of each of said pairs being spaced from one another, a rectangular bracket disposed between and connected to the posts or standards of each of said pairs of posts or standards, means for slidably and adjustably securing said brackets to the posts, and a plank supported at its ends on said brackets.

5. A scaffold structure as in claim 4, comprising studs fixed to and projecting upwardly from said brackets for engaging the side edges of the plank.

6. A scaffold structure as in claim 4, said means comprising hooks for engaging said brackets and having threaded shanks, washers carried by said shanks for engaging the shanks of the plank, and nuts engaging said threaded ends for clamping the ends of the plank between the brackets and washers.

7. A scaffold comprising an upright, substantially square frame, said frame including upright corner posts, braces, connecting said posts, formed of telescoping sections, means for retaining the sections in adjusted positions relatively to one another, brackets projecting from said corner posts, said brackets including pairs of brackets projecting in corresponding directions, means for adjustably and detachably securing said brackets to the corner posts, and planks having their ends supported by the brackets of each of said pairs.

8. A scaffold comprising a pair of upright standards, brackets, means for detachably and adjustably securing said brackets to the standards, a plank having its ends supported by said brackets, sleeve members slidably engaging said standards, arms projecting from said sleeve members and laterally of the standards, said arms having hook shaped free ends for engaging a piece of spouting, and means for clamping said hook shaped ends to the spouting.

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