Feb. 2, 1960 A. W. HARWELL 2,923,374

KNOCK DOWN TUBULAR SCAFFOLD

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FIG. 1

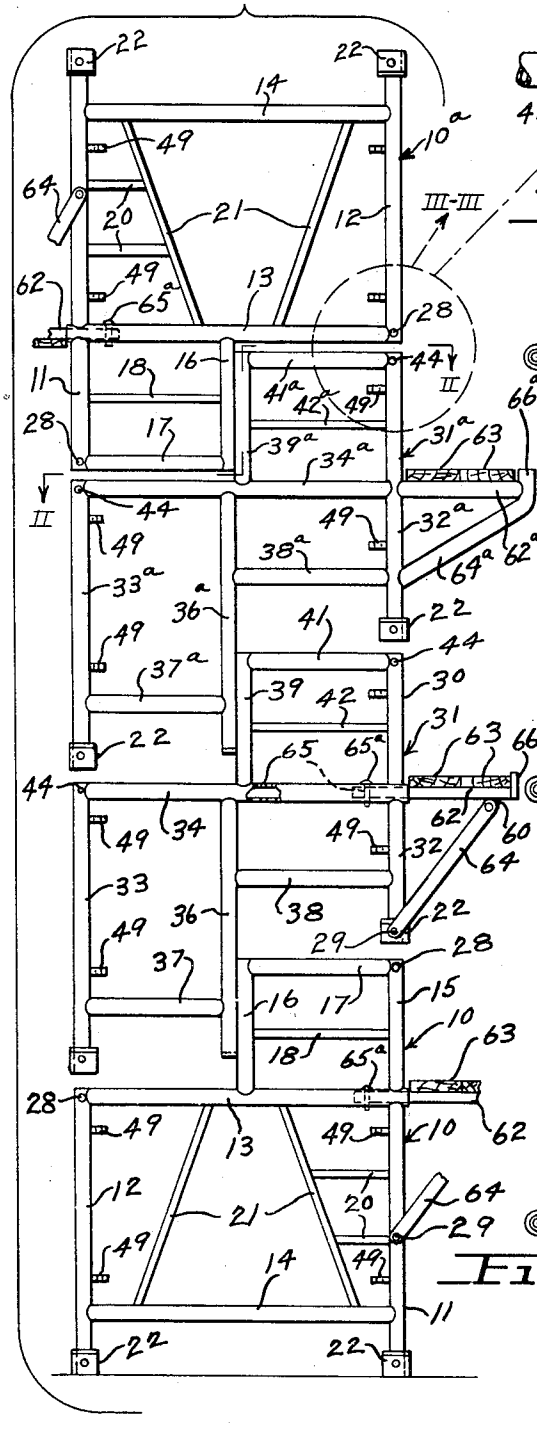
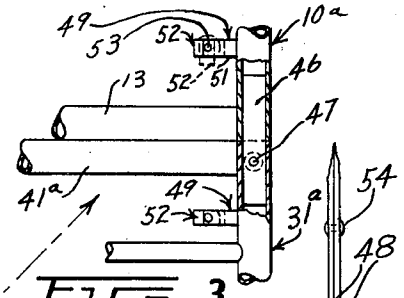


FIG. 3



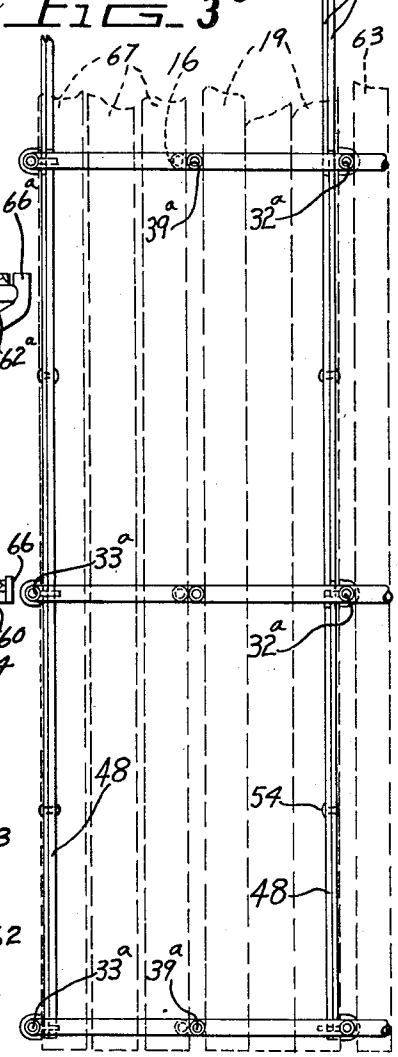


FIG. 2

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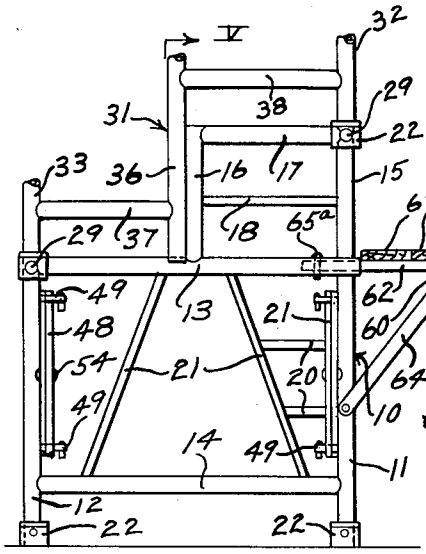


FIG. 4

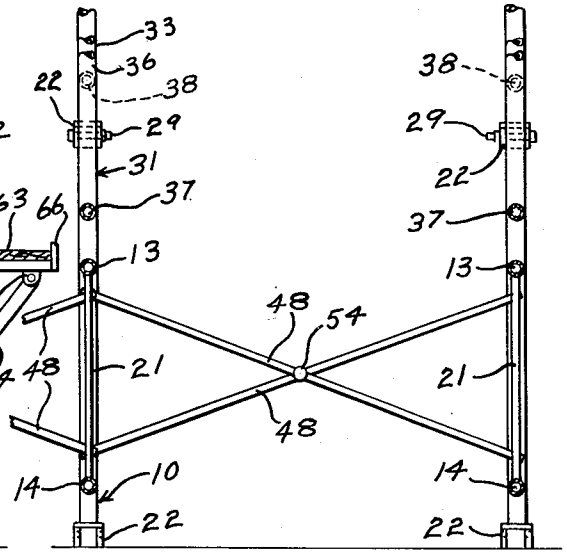
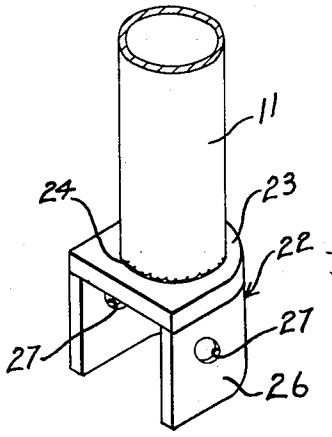


FIG. 5

FIG. 6



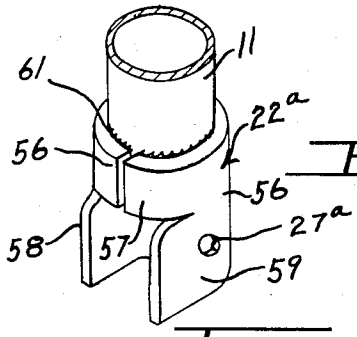


FIG. 7

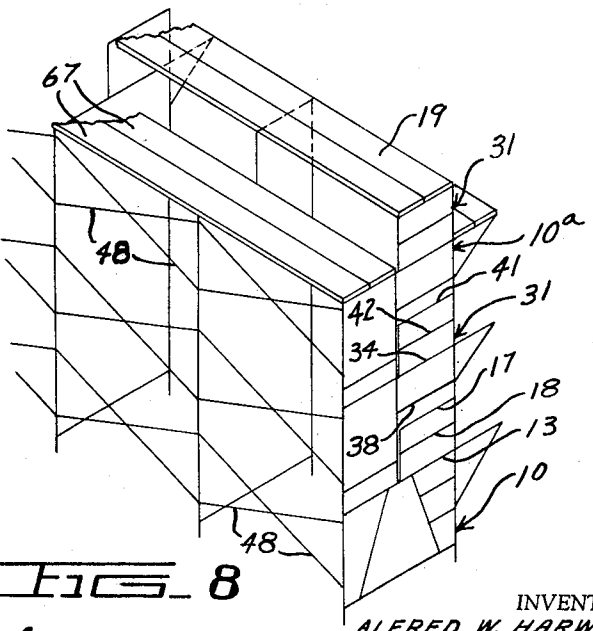


FIG. 8

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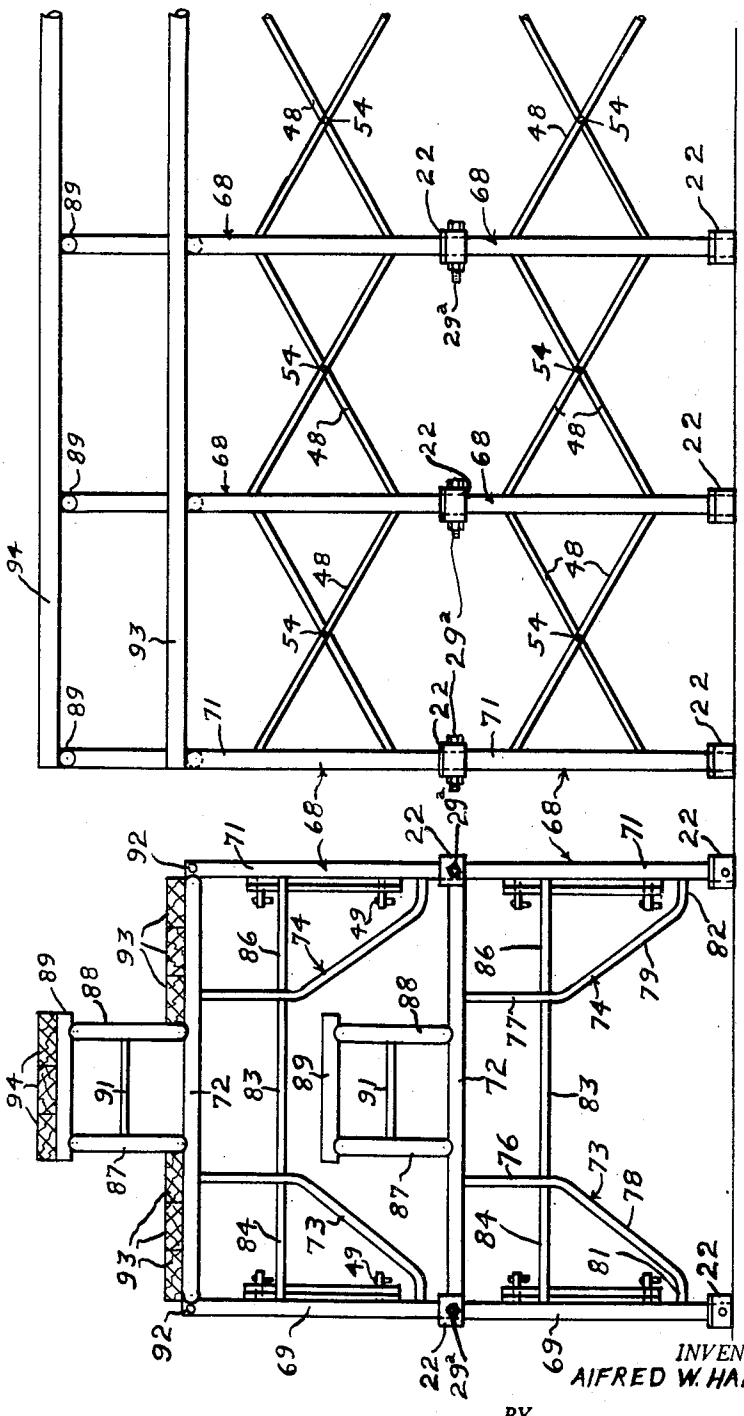


Fig. 10

Fig. 9

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United States Patent Office 2,923,374 Patented Feb. 2, 1960

2,923,374

KNOCK DOWN TUBULAR SCAFFOLD

Alfred W. Harwell, Birmingham, Ala.

Application January 9, 1956, Serial No. 557,998

1 Claim. (Cl. 182—132)

My invention relates to knock down scaffolds of the type especially adapted for use in laying brick walls and the like, and for use wherever workmen must have an elevated platform to perform work or labor upon a building or the like and is a continuation in part of my copending application, Serial No. 459,479, filed September 30, 1954, and entitled Knock Down Tubular Scaffold, now abandoned.

An object of my invention is to provide a knock down scaffold embodying at least one uninterrupted walkway along a side thereof on which workmen may stand to lay bricks or the like onto the wall or may stand to perform other operations.

Another object is to provide a scaffold which may comprise end frames shaped somewhat like the letter Z turned on its side as viewed in end elevation, such frame being made preferably of tubing, whereby such end sections may be nested on top of each other to provide a supporting structure for a walkway which is uninterrupted along the entire length of the scaffolds, regardless of the number of end frames and truss members comprising the entire scaffold.

Another object is to provide a scaffold of the character designated which has an uninterrupted walkway along one side at one level, and means at a slightly higher level for supporting a deck on which materials such as bricks and mortar may be stored in easy reach of the workmen standing on the walkway, whereby the bricks and mortar may be transferred with a lateral swinging motion toward the wall without the workmen having to stoop to lift the materials into place, thus considerably speeding the laying of the wall and lessening worker fatigue.

A still further object is to provide a knock down steel scaffold having end frames providing uninterrupted horizontal walkways along each side and a raised uninterrupted material storage deck between the walkways, whereby a group of masons or the like may stand on one of the walkways near the wall being built while materials may be placed on the raised deck by a group of helpers, thus improving the efficiency of the entire operation and preventing interference between the groups of workmen as they perform their respective tasks.

A further and more general object is to provide a knockdown scaffold which embodies two standard end frame units, namely a combined bottom and top unit and an intermediate unit, the units being so designed that the bottom unit may be assembled in inverted position on the intermediate section to provide a flat deck support as wide as the entire scaffold whenever such width is desired; on the other hand, and of more general and frequent use the scaffold may be used with a single bottom row of units in place and with the intermediate units in place, thus providing the aforementioned walkways and raised material storage deck.

Heretofore in the art to which my invention relates difficulties have been encountered in the erection and use of scaffolds due to the fact that the walkways and material supporting platforms have been interrupted by a plurality

of transverse brace or support members, thus causing the workmen to step over the same as they move from one end of the scaffold to the other. Also, the work materials must be lifted over such transverse barriers, thus making it impractical to use wheelbarrows to transfer the work materials from one end of the scaffold to the other. I overcome these and other difficulties by providing uninterrupted walkways and platforms as described in the above objects. Also, by providing walkways at each side of the elevated platform, I relieve the congestion presently existing when one group is performing the work while along the same walkway another group is delivering material and storing it thereon.

A scaffold embodying features of my invention is illustrated in the accompanying drawings, forming a part of this application, in which:

Fig. 1 is an end elevational view, partly broken away and in section, showing the bottom, top and intermediate sections in disassembled position;

Fig. 2 is a view taken along the line II—II of Fig. 1, partly broken away and in section;

Fig. 3 is an enlarged fragmental view, partly broken away and in section, showing one means for connecting the sections together;

Fig. 4 is an end elevational view, partly broken away and in section, showing the bottom section in assembled position and showing the manner in which the intermediate section is connected to the bottom section;

Fig. 5 is a sectional view taken along the line V—V of Fig. 4;

Fig. 6 is an enlarged detail view, partly broken away and in section, showing another means for connecting the individual sections;

Fig. 7 is an enlarged detail view, partly broken away and in section, showing still another means for connecting the sections;

Fig. 8 is a diagrammatic view of the assembled scaffold, partly broken away;

Fig. 9 is an end elevational view, showing a modified form of scaffold construction; and,

Fig. 10 is a side elevational view of the scaffold shown in Fig. 9, partly broken away.

Referring now to the drawings for a better understanding of my invention I show bottom and top end sections indicated generally by the numerals **10** and **10***a*. In view of the fact that the construction of the end sections **10** and **10***a* is the same, the only difference being that the section **10***a* is assembled in inverted position, a description of the bottom section **10** will suffice for both. The end section **10** comprises vertical tubular members **11** and **12** which are connected by upper and lower horizontal tubular members **13** and **14**. Secured to the horizontal member **13** in vertical alignment with the vertical member **11** is a vertical tubular member **15**. Secured to the horizontal tubular member **13** adjacent the mid-point thereof is a vertical tubular member **16**. Connecting the upper ends of the vertical tubular members **15** and **16** is a short horizontal tubular member **17** which is substantially parallel to the horizontal tubular member **13**. Secured to the vertical members **15** and **16** substantially equidistant from the horizontal members **13** and **17** is a horizontal tubular member **18** which adds strength to the scaffold and serves as a support for boards **19** which form an elevated platform, to be described hereinafter. Suitable diagonal braces **21** connect the horizontal tubular members **13** and **14** to form a rigid structure. Horizontal members **20** connect the diagonal braces **21** to the vertical member **11** to provide ladder means for the section **10**.

Secured to the bottoms of the vertical members **11** and **12** are connecting brackets **22** which are employed to connect the individual sections together. As shown

in Fig. 6, the connecting bracket 22 comprises a horizontal plate 23 secured to the lower ends of the vertical members 11 and 12 by any suitable means, such as by welding at 24. Secured to the undersurface of the plate 23, as by welding, is a U-shaped member 26 having aligned openings 27 in the legs thereof. Suitable openings 28 are provided in the upper ends of the vertical members 12 and 15 in position to receive pins 29 which pass through the aligned openings 27 in the connecting brackets on the superjacent section, as shown in Fig. 4.

The intermediate section of the scaffold, indicated at 31, is shaped somewhat like the letter Z turned on its side as viewed in end elevation, as shown in Fig. 1. The intermediate section 31 comprises vertical tubular members 32 and 33 at opposite sides thereof. Mounted at the lower ends of the vertical tubular members 32 and 33 are connecting brackets 22 which are adapted to receive the upper ends of the vertical members 15 and 12, respectively, of the lower section 10.

As shown in Fig. 1, the vertical member 32 is shorter than the member 33 whereby they both terminate at substantially the same level. Connecting the upper ends of the vertical members 32 and 33 is a horizontal member 34. Secured to the horizontal member 34 and projecting downwardly therefrom substantially parallel to the vertical members 32 and 33 is a vertical member 36. The vertical member 36 is spaced from the vertical members 32 and 33 a distance whereby it lies alongside the vertical member 16 of the lower section 10 when assembled thereon. Connecting the vertical members 33 and 36 adjacent the lower ends thereof is a horizontal tubular member 37. Secured to the vertical member 32 adjacent the lower end thereof and connecting the same to the vertical member 36 is a horizontal tubular member 38.

Secured to the tubular member 34 adjacent the mid point thereof is an upstanding member 39 which is positioned to lie in the same vertical plane as the vertical member 16 of the section 10, when assembled. That is, the vertical member 39 is positioned whereby the vertical member 36 of a superjacent section will lie alongside the same, as shown in Fig. 1. Secured to the horizontal member 34 and in vertical alignment with the vertical member 32 is an upstanding member 30. Connecting the upper ends of the vertical members 30 and 39 is a horizontal member 41. Also, connecting the vertical members 30 and 39 between the horizontal members 34 and 41 is a horizontal member 42. The horizontal members 13, 17, 18, 38, 41 and 42 all serve as supports for the board members 19 whereby the boards may be elevated to form a platform of the desired height. Also, these horizontal members in combination with the horizontal members 20 form a ladder for the scaffold.

Openings 44 are provided in the upper ends of the vertical tubular members 30 and 33 for receiving the pins 29 whereby an intermediate section 31 can be connected to a superjacent section 31. To connect the intermediate section 31 to a superjacent section 31, the connecting brackets 22 are employed.

To connect a section 10*a* to the upper end of an intermediate section 31, I employ an inner rod or tubular member 46 having a transverse opening therethrough which is in alignment with the opening 44 when the upper section 10*a* is placed on the intermediate section 31, as shown in Fig. 3. A suitable pin 47 passes through the opening 44 and the opening in the member 46 thereby connecting the sections.

As shown in Figs. 5 and 8, the end sections are cross braced by removable brace members 48 which may also be of tubular construction. The cross braces are connected to the vertical members 11 and 12 of the lower and upper sections 10 and 10*a* and to the vertical member 30—32 and 33 of the intermediate sections 31 by means of suitable connectors 49. As shown in Fig. 3, each connector 49 comprises a bracket 51 having a suitable slot in the outer end thereof for receiving a latch member 52 which is mounted for pivotal movement about a pin 53. The ends of the brace members 48 are provided with transverse openings therethrough for receiving the brackets 49 as shown in Fig. 4.

To install the brace members 48, the latch members 52 are moved to the solid line position shown in Fig. 3. After the brace members 48 have been positioned on the brackets 49, the latch members 52 are moved to the dotted line position shown in Fig. 3, thereby locking the brace members in place. To add further strength to the brace members 48, I connect each pair adjacent the mid-point thereof by means of a suitable pin 54, as shown in Fig. 5.

In Fig. 7 of the drawings I show a slightly modified form of connecting member 22*a* which may be secured to the lower ends of the vertical members 11, 12, 32 and 33 instead of the connecting members 22. The connecting member 22*a* is formed from a rectangular blank having outwardly extending projections 56 and 57 along the upper portion of the sides thereof. The blank is formed into a curved member, as shown in Fig. 7, with the projections 56 and 57 adjacent each other, the lower portion of the blank is bent outward, as shown, to form a U-shaped lower end having legs 58 and 59. The connecting members 22*a* are secured to the lower ends of the vertical members 11, 12, 32 and 33 as by welding at 61. Aligned openings 27A are provided in the connecting member 22*a* for receiving the pin 29 in the manner described above.

Telescoping within the end of the horizontal tubular member 34 adjacent the vertical members 30 and 32 is a tubular member 62 for supporting boards 63 which form a walkway outwardly of and alongside the vertical members 30. Mounted on the undersurface of the member 62 adjacent the outer end thereof is a bracket 60. Pivotally connected to the bracket 60 is a diagonal brace member 64 which is detachably connected at its lower end to the pin 29 connecting the vertical members 15 and 32. Vertical openings 65 are provided in the tubular member 34 and a suitable vertical opening is provided in the member 62 in alignment with the openings 65 whereby the member 62 may be locked in either the extended or retracted position by a pin 65*a*. Mounted at the outer end of the tubular member 62 and projecting upwardly therefrom is a member 66 which prevents outward movement of the boards 63. As shown in Fig. 1, the end sections 10 and 10*a* are also provided with the tubular members 62 which telescope in the open ends of the tubular members 13. A suitable opening is provided in the vertical member 11 for receiving a pin 29 whereby the lower end of the brace member 64 is connected to the member 11.

In Fig. 1, I show a slightly modified form of intermediate end section 31*a* resting on the intermediate end section 31. The section 31*a* is also shaped somewhat like the letter Z turned on its side as viewed in end elevation and comprises vertical tubular members 32*a* and 33*a* at opposite sides thereof. Mounted at the lower ends of the vertical tunbular member 32*a* and 33*a* are connecting brackets 22 which are adapted to receive the upper ends of the vertical members 30 and 33 of the subjacent section 31.

The vertical members 32*a* and 33*a* are substantially equal in length whereby the member 32*a* projects above the top of the vertical member 33*a*. Connecting the upper end of the vertical member 33*a* and the vertical member 32*a* is a horizontal member 34*a*. Secured to the horizontal member 34*a* and projecting downwardly therefrom substantially parallel to the vertical members 32*a* and 33*a* is a vertical member 36*a* which is positioned to lie alongside the vertical member 39 of the subjacent section when assembled. Connecting the vertical members 33*a* and 36*a* adjacent the lower ends thereof is a horizontal tubular member 37*a*. A horizontal tubular member 38*a* connects the lower portion of the member 32*a* to the member 36*a*.

Mounted on the member 34*a* adjacent the mid point thereof is an upstanding 39*a* which lies in vertical alignment with the member 39 of the subjacent section 31, when assembled. Connecting the upper ends of the vertical members 32*a* and 39*a* is a horizontal member 41*a*. Also, connecting the vertical members 32*a* and 39*a* between the members 34*a* and 41*a* is a horizontal member 42*a*. Openings 44 are also provided in the upper ends of the vertical tubular members 32*a* and 33*a* for receiving the pins 29 or 47, as the case may be.

Secured to the vertical member 32*a* of the intermediate section 31*a* is an outwardly projecting horizontal member 62*a* for supporting the boards 63. Connecting the outer end of the horizontal member 62*a* to the lower portion of the vertical member 32*a* is a suitable diagonal brace member 64*a* having an upturned outer end 66*a* which projects above the horizontal member 62*a*, thus limiting outward movement of the boards 63.

The boards 63 form a walkway outwardly of and below the level of a platform formed by placing board members 19 acoss the horizontal members 41, 41*a*, 42 and 42*a*. Also, board members 67 are positioned across selected ones of the horizontal members 13, 34, 37, 34*a* and 37*a* of the lower and intermediate sections, to form a walkway on the opposite side of the structure from the boards 63, which is also below the level of the platform formed by placing the boards across the horizontal members 41, 42, 41*a* and 42*a*.

From the foregoing description, the operation and erection of my improved scaffold shown in Figs. 1 to 8 will be readily understood. The end members 10 are connected by the brace members 48 and the latch members 52 are moved to the dotted line position, as shown in Fig. 3, thus securing the lower end members together, as shown in Fig. 5. The vertical members 11 and 15 of the lower section 10 are placed adjacent the building being constructed and the boards 63 are placed across the horizontal members 62 to form a walkway adjacent the building. The board members 19 are placed across the horizontal members 13, 17 or 18 to provide a platform which is adapted to support the mortar, bricks or the like at an elevation within easy reach of the worker standing on the boards 63. The boards 67 are positioned on the horizontal members 13 to form a walkway on the side of the scaffold opposite the building, thus permitting the laborers to walk thereupon to distribute the work materials.

To increase the height of the scaffold, the intermediate end sections 31 or 31*a* are positioned on top of the bottom sections 10 and are connected thereto by the connecting brackets 22. The brace members 48 of the intermediate section are then connected in the manner described above. The boards 67 are moved to span the horizontal members 34. The boards 19 are moved upwardly so as to span the horizontal members 34, 42, or 41, depending upon the desired elevation of the platform for supporting the work materials. The boards 63 rest on the horizontal members 62 to form a walkway along-side the scaffold adjacent the building thus permitting skilled workmen to walk thereupon. The height of the scaffold may thus be raised to any desired level by adding intermediate sections 31 or 31*a* and positioning the boards 19, 63 and 67 at the desired elevation thereon. Since the erection and use of the end section 31*a* is substantially the same as that of the end section 31, no detail description of the erection and use thereof is deemed necessary.

As shown in Fig. 1, the top unit or section 10*a* can be positioned on top of the intermediate section 31 or 31*a* to provide a flat deck support as wide as the entire scaffold. To mount the top section 10*a* on the upper intermediate section 31*a*, the cylindrical member 46 is telescoped within the abutting ends of the vertical members 12—32*a* and 11—33*a* whereby the pin 47 passes through the opening 44 in the vertical member 32*a* and 33*a* and the opening in the member 46.

In Figs. 9 and 10 I show a modified form of scaffold construction in which the end sections 68 forming the bottom, intermediate and top sections are all identical in construction. The end section 68 comprises vertical side members 69 and 71 joined at the tops thereof by a horizontal cross member 72. The side members 69 and 71 are connected to the cross member 72 by braces 73 and 74 which extend downwardly from the cross member 72 as at 76 and 77 and then downwardly and outwardly toward the side members 69 and 71, respectively, as at 78 and 79 where they terminate in substantially horizontal portions 81 and 82. To add further strength to the end frame 68, the braces 73 and 74 are connected by a horizontal transverse member 83. Also, the side members 69 and 71 are connected to the braces 73 and 74 by other horizontal braces 84 and 86, respectively.

Mounted rigidly on the horizontal cross member 72 are upstanding supports 87 and 88 which are connected at their upper ends by a transverse cross member 89. The supports 87 and 88 are connected by a horizontal brace 91. Also, as shown in Fig. 9, the upstanding supports 87 and 88 are positioned adjacent the center of the horizontal cross member 72 in position to enter the space between the braces 73 and 74 of a superjacent end section. Adjacent end sections are connected to each other by means of the connecting brackets 22 and bolts 29*a* which pass through suitable openings 92 at the upper ends of the side members 69 and 71.

As shown in Fig. 10, the erected end sections are cross braced by the removable braces 48 which are connected to the vertical side members 69 and 71 by the connectors 49 as described heretofore. Also, each pair of braces 48 is connected adjacent the centers thereof by means of the pin 54.

Boards 93 are positioned on the horizontal cross members 72 at opposite sides of the upstanding supports 87 and 88 to form walkways adjacent the top of the uppermost sections, as shown. Also, boards 94 are positioned on the uppermost transverse cross members 89 to form a deck for receiving materials, such as mortar, bricks or the like. If desired boards to form walkways may be placed on horizontal braces 84 and 86. However, such walkways will not be uninterrupted as are the walkways formed by the boards 93.

The operation and erection of my improved scaffold shown in Figs. 9 and 10 is similar to that of the scaffolds shown in Figs. 1 through 8. However, in view of the fact that the end sections 68 are all identical in construction, the sections are positioned on top of each other until the desired elevation is reached. Accordingly, there is no necessity for providing special bottom and top sections for the scaffold. Also, the tubular support members 62 and 62*a* are eliminated due to the fact that the boards 93 are supported by the cross members 72. The horizontal cross members 72 and the braces for the end sections 68 form a ladder which gives easy access to workers moving up and down the scaffold.

From the foregoing it will be seen that I have devised an improved scaffold which supports building materials, such as mortar, brick and the like at a convenient working level. By providing such a supporting platform in combination with an uninterrupted walkway the work materials such as brick, mortar, tools and the like are located in easy reach of workmen standing on the walkway, whereby the bricks and mortar, may be transferred with a lateral swinging movement toward the wall without the workmen having to stoop to lift the same into place. Also, by providing walkways at each side of the platform both skilled and unskilled labor are relieved of the congestion which has heretofore existed when one group is laying brick while along the same walkway another group is delivering materials and storing the same on the same platform. By providing uninterrupted walk-

ways herein described, there are no parts of the end frames over which workmen must step or move materials. Furthermore, the horizontal support members and braces form a ladder which gives easy access up and down the scaffold.

While I have shown my invention in several forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claim.

What I claim is:

A scaffold having spaced vertical rows of vertically aligned end frames extending transversely of the scaffold, each of said vertical rows comprising a plurality of end frames stacked on top of each other, each end frame having a pair of spaced vertical side members forming the outer sides of the end frame, means on one end of each of said vertical side members for receiving in telescoping relation the end of a similar vertical side member on an adjacent vertically aligned end frame disposed thereover for securing said adjacent end frame in place, a horizontal member extending between and rigidly connecting the upper ends of said vertical side members, a pair of transversely spaced upstanding supports rigidly secured to said horizontal member intermediately thereof and leaving sufficient space on the horizontal member between the upstanding supports and the vertical side members for supporting a walkway adjacent each side of the upstanding supports inwardly of said vertical side members, said upstanding supports being of a height less than the height of said vertical side members, a horizontal support extending between and connecting the pair of upstanding supports for forming a support for an elongated deck, the uppermost end frame supporting an uninterrupted walkway adjacent each side of the upstanding supports and between the vertical side members with the walkways having their outer edges disposed inwardly of said vertical side members, braces connecting said vertical side members to said horizontal member at the spaces on the horizontal member between the side members and the upstanding supports and receiving therebetween the upstanding supports and the connecting horizontal support of a subjacent end frame, additional bracing extending longitudinally of the scaffold and between the vertical rows of end frames for connecting the spaced vertical rows of end frames to each other with each end frame in a vertical row having longitudinal bracing secured thereto, and means on each end frame for securing said longitudinal bracing.

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