

Sept. 22, 1970

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3,529,694

PORTABLE COLLAPSIBLE SCAFFOLD

Filed March 10, 1969

2 Sheets-Sheet 1

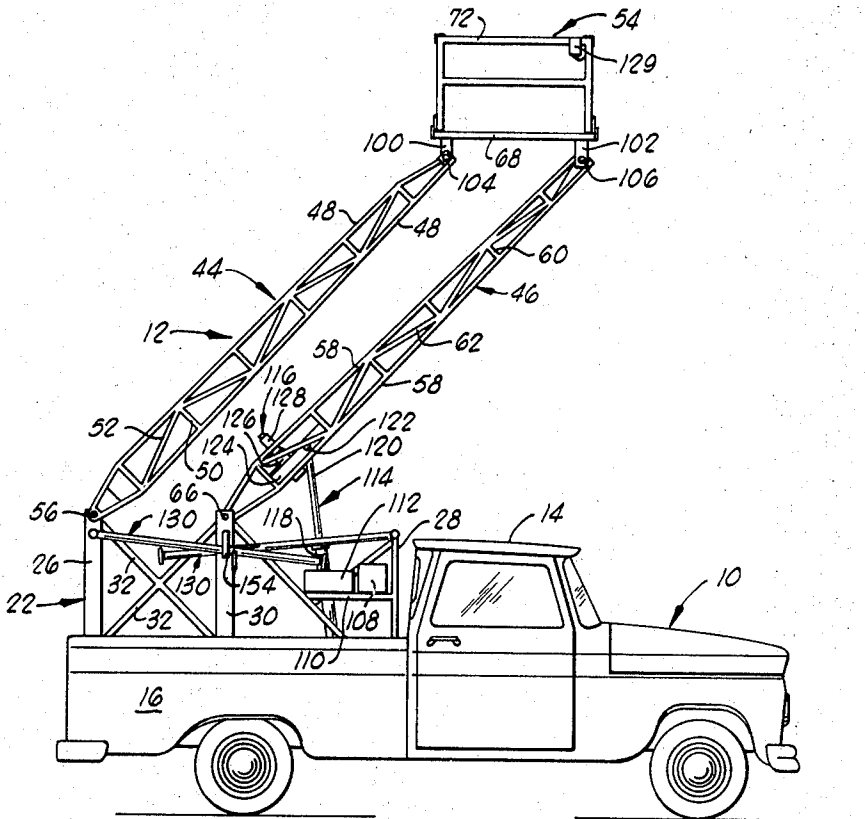


Fig. 1

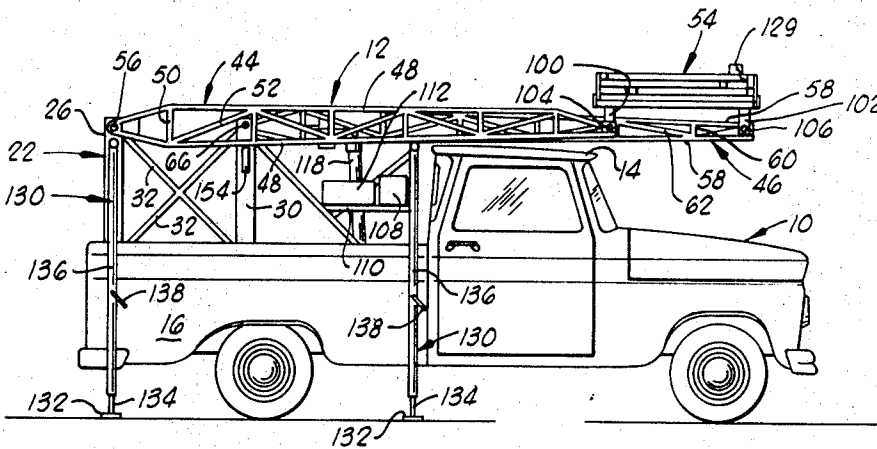


Fig. 2

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2 Sheets-Sheet 2

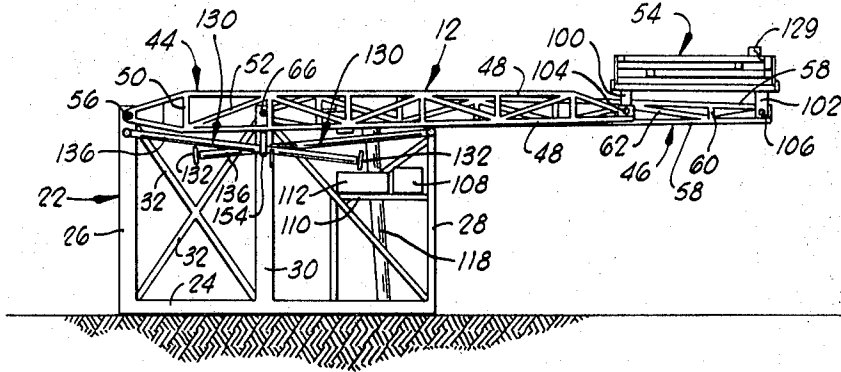


FIG. 4

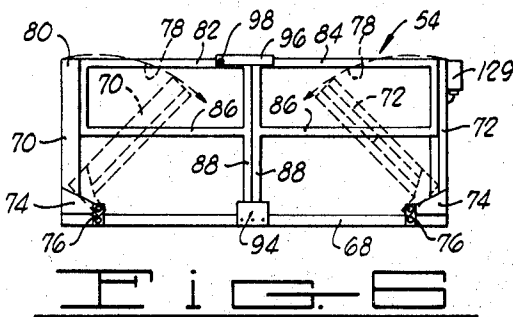


FIG. 5

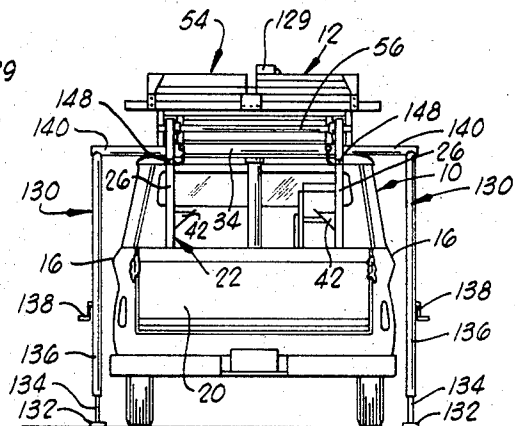


FIG. 6

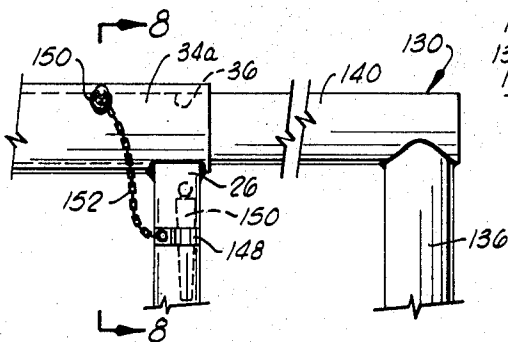


FIG. 7

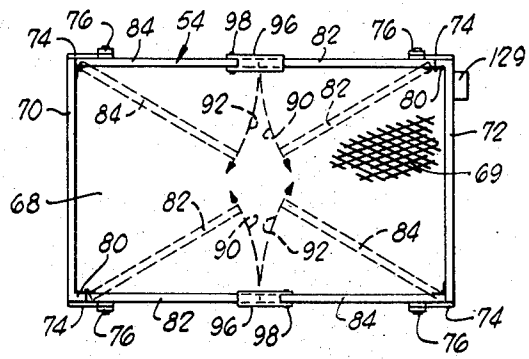


FIG. 8

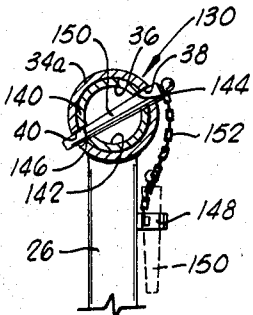


FIG. 9

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PORTABLE COLLAPSIBLE SCAFFOLDGeorge L. Atchey, 3715 Bella Vista,
Midwest City, Okla. 73112Continuation-in-part of application Ser. No. 678,734,
Oct. 27, 1967. This application Mar. 10, 1969, Ser.
No. 805,773

Int. Cl. A01g 19/04; E04g 1/00; E06c 5/06

U.S. Cl. 182-2

17 Claims

ABSTRACT OF THE DISCLOSURE

A scaffold apparatus mountable in the bed of a truck and expandable to an elevated status, or similarly expandible when demounted and rested on the ground. The structure includes a base structure and a pair of parallel boom elements, each pivotally secured at one end to the base structure and at their opposite ends to a work platform. The work platform includes a floor, side fences pivotally secured on opposite ends of the floor, and a plurality of gate members. Each gate member is pivotally secured to one side fence in such a manner that it can be pivoted to a position adjacent such fence. Each side fence can then be pivoted with the adjacent gate members to a position parallel to the floor of the work platform. A piston and cylinder structure is interconnected between the base structure and booms for elevating the booms. Transverse members on the base structure slidingly and rotatingly receive portions of a plurality of outrigger jacks. The jacks can be rotated to an out-of-the-way position for storage, or to a ground contacting position wherein they extend to the outside of a truck carrying the scaffold apparatus. The jacks can then be used for off-loading the scaffold from the truck.

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of copending application Ser. No. 678,734, filed Oct. 27, 1967, now U.S. Pat. No. 3,472,337.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to expandable work platforms and scaffolding which can be used to elevate a workman to a high work location, or folded down to a compact, inoperative status. More particularly, the invention relates to a collapsible work platform and outrigger jacks used in expandable scaffolding of the type which can be transported and used while mounted upon a light truck.

Brief description of the prior art

A number of instances exist where it is necessary to elevate a workman above ground level in an outdoor location for the purpose of permitting the workman to make relatively rapid repairs to elevated structures, such as street lights, trolley power lines, traffic signal lamps, and the like. For this purpose, a number of special vehicles have heretofore been built which incorporate a rather massive scaffolding structure which can be elevated to selected heights, can be swiveled about so as to move the workman in a horizontal direction, and can be driven from one location to another. Many of these structures contain complicated machinery and are relatively expensive to construct and maintain. In most instances, the scaffolding or structure employed to elevate the workman cannot be easily detached or demounted from the framework of the vehicle, but rather, is made a permanent portion of the vehicle, thus rendering the vehicle incapable of other utility, and requiring that both the vehicle and scaffolding structure always be present at the same loca-

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tion. In other instances, equipment of the general type described has been so large in its vertical dimension that freedom of movement of the vehicle is somewhat restricted, and care must be exercised in traversing underpasses and trunnels having a limited vertical clearance.

BRIEF DESCRIPTION OF THE PRESENT INVENTION

The present invention provides a portable collapsible scaffold which can be utilized to elevate a workman to a substantial height, either when the scaffold is supported on the ground, or when it is mounted in quick detachable fashion on a relatively small, lightweight truck. The scaffold can be easily mounted on, or demounted from, a truck by a single operator, so that the entire assembly, including the truck and collapsible scaffold, can be operated by a single workman. The portable collapsible scaffold carries a self-contained power unit which permits it to be operated independently of the power plant of the truck. Moreover, when the scaffolding is folded downwardly to its collapsed or traveling position, it adds very little to the total height of the truck and consequently problems of inability to pass beneath relatively low vertical clearance structures are seldom encountered.

Broadly described, the present invention comprises; a base structure, which is adapted to be detachably secured to the bed of the truck, having a forward end portion and a rear end portion. A pair of transverse members are extended generally horizontally across the base structure and secured to the base structure, each transverse member preferably having a bore extending therethrough. A plurality of outrigger jacks are provided which detachably engage the respective transverse members. Each outrigger jack includes an elongated sleeve having an upper and a lower end; a ground contacting portion which adjustably engages the lower end portions of the elongated sleeve, whereby the height of the elongated sleeve is adjustable by raising and lowering the ground contacting portion; and a bar which is secured at one end portion thereof to the uppermost end portion of the elongated sleeve. The opposite end of the bar is slidingly disposed in the bore of one of the transverse members. Means is provided to secure each bar in position with respect to each transverse member. A pair of elongated boom elements is provided, each of the boom elements being pivotally secured at one end thereof to the base structure. Means is provided to raise and lower the booms by pivotation about the horizontal axes thereof.

A horizontally extending work platform is provided and includes a generally rectangularly shaped base frame which is pivotally secured to the ends of the booms opposite their ends which are pivotally secured to the base structure. A pair of side guard fences extend, in a first position, generally perpendicular to the base frame, and each guard fence is pivotally secured to one side of the base frame in such manner that when each side guard fence is pivoted to a second position generally parallel to the base frame, a space exists between each side guard fence and the base frame. A pair of gate members is disposed above the base frame of the platform. Each gate member is pivotally secured to an end of one of the side guard fences so that, in one position, the gate members and guard fences form a rectangular enclosure. One of the gate members on each respective side guard fence can be pivoted to a position generally adjacent and parallel to the respective side guard fence, and the other of the gate members of the same side guard fence can be pivoted to a position generally adjacent the gate member secured to the other end of the guard fence. In this position the pair of gate members on each guard fence generally occupy the space between each side guard fence and the base frame when each side guard fence is piv-

oted to a position generally parallel to said base frame.

From the foregoing general description of the invention, it will have become apparent that one object of the invention is to provide an improved, portable, collapsible scaffold which can be easily mounted on, or de-
5 mounted from, a lightweight truck so that the truck can be utilized for servicing and maintaining vertically elevated structures, and can also be used at other times in the normal fashion characteristic of lightweight trucks without impairment by the presence of the scaffolding.

An additional object of the invention is to provide a vehicle carrying elevatable scaffolding to permit a work-
10 man to be elevated to a high vertical level, which scaffolding can be folded down to a compact position in which the vertical dimension of the entire structure is only slightly greater than the distance from the ground to the top of the cab of the vehicle.

A further object of the invention is to provide a portable collapsible scaffold which includes a self-contained power plant, and which can be used either when mounted
20 on a transporting vehicle or when rested upon the ground.

A still further object of the invention is to provide a portable collapsible scaffold structure which can be used with a maximum degree of safety by a workman who is
25 elevated by the scaffold structure.

An additional object of the invention is to provide a portable collapsible scaffold which automatically locks in a collapsed, compact, inoperative position.

One other object of the invention is to provide a portable collapsible scaffold structure which can be quickly
30 and easily disassembled if it is desired to separately transport various portions of the structure from one location to the other, or to repair or replace various portions of the structure.

Another object of the invention is to provide a work platform for a portable collapsible scaffold structure,
35 which platform can be easily and quickly placed in an assembled or in a nonoperating position and yet provides a safe secure working area.

Another object of the invention is to provide a portable scaffold structure, including manual jack elements
40 which permit the scaffold structure to be loaded and off-loaded on a vehicle for purposes of transport, with such loading or off-loading being accomplished by a single person.

Another object of the invention is to provide a portable collapsible scaffold structure having outrigger jack
45 elements which can be rotated to an out of the way position when not in use without completely disassembling the jack elements.

A further object of the invention is to provide a portable collapsible scaffold structure having outrigger jack
50 elements which are removably secured to the scaffold structure in such a manner that when the jack elements are in the operating position, any movement of the scaffold structure, including the outrigger jacks, tends to more securely tighten the interconnection between the outrigger jacks and the scaffold structure, thereby providing a safer and a more secure structure.

Another object of the invention is to provide a portable collapsible scaffold structure which is relatively in-
60 expensive in construction, yet is of strong, durable character and possessed of a long and trouble-free operating life.

In addition to the foregoing described objects and advantages, additional objects and advantages will become
65 apparent as the following detailed description of the invention is read in conjunction with the accompanying drawings which illustrate the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view in elevation of the portable collapsible scaffold of the present invention as the scaffold appears
70 when mounted on a pickup truck in its elevated operative status.

FIG. 2 is a view similar to FIG. 1, but showing the scaffold in its transport or collapsed status and illustrating the outrigger jacks positioned and connected for off-load-
ing the scaffold from the truck.

FIG. 3 is a view similar to FIG. 2, but in elevation
5 from the rear of a pickup truck in which the portable collapsible scaffold of the present invention is mounted.

FIG. 4 depicts the portable collapsible scaffold of the invention as it appears after it has been off-loaded from the truck and placed upon the ground with the scaffold
10 collapsed to a compact, inoperative status.

FIG. 5 is a plan view of the work platform employed in the scaffold. The gate members of the work platform are shown in dashed lines to better illustrate the manner in which these gate members are folded to a collapsed
15 inoperative position.

FIG. 6 is a front elevation view of the work platform shown in FIG. 5. The side guard fences and the collapsed gate members are shown in dashed lines to better illustrate the manner in which these guard fences and gate mem-
20 bers are folded down to a collapsed, inoperative position.

FIG. 7 is an enlarged partial elevation showing the interconnection between an outrigger jack and the transverse member, which is secured generally between forward
25 corner posts forming a portion of the invention.

FIG. 8 is a view of a section taken substantially along the lines 8—8 of FIG. 7. A nonuse position of a securing pin forming a part of the invention is shown in dashed lines.

BRIEF DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

In the following description, reference will be made to various portions of the accompanying drawings, with reference numerals associated with lead lines which have arrowheads being utilized to designate broad combina-
tions which include several subassemblies or several elements having a unitary function in the overall operation of the scaffold of the invention. Numerals which are con-
nected to various structural parts by plain lead lines (having no arrowheads) will be utilized to designate individual elements of structure.

Referring initially to FIG. 1 of the drawings, a vehicle, typically a pickup truck 10, is shown supporting the portable collapsible scaffold of the present invention, designated generally by reference numeral 12. It should be understood, however, that one of the inventive aspects of the present disclosure is considered to be the structural combination of the portable collapsible scaffold with a vehicle of the type depicted, due to the novel and peculiar adaptability of the scaffold to the bed structure of the typical pickup truck. Thus, the truck 10 includes the usual flat, substantially horizontally extending bed (not shown) located to the rear of the truck cab 14 and having side-boards or side walls 16. A tailgate 20 (see FIG. 3) is usually provided to provide a closure or gate extending across the rear of the bed of the truck 10.

The portable collapsible scaffold 12 includes a base structure 22 comprising a pair (only one is shown) of substantially parallel, horizontally spaced, horizontally extending runners 24 (see FIG. 4), and four substantially parallel, vertically extending corner posts (only two are shown), with the rear corner posts being designated by reference numeral 26 and the forward corner posts being designated by reference numeral 28. The corner posts 26 and 28 are each secured at their lower ends to the runners 24, and the rear corner posts 26 extend to a slightly greater height than the forward corner posts 28 for a reason hereinafter to be described. A pair or (only one is shown) central, vertically extending posts 30 are also provided in the base structure 22 and are secured at their lower ends to the runners 24.

A plurality of transverse frame members interconnect the two runners 24, holding the runners 24 in a horizontal distance apart, and a plurality of braces are provided
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generally between the runners 24 and the transverse frame members for purposes of reinforcement. An upper transverse member (not visible in the drawings) interconnects the vertically extending posts 30. A plurality of long diagonal braces 32 are extended between the vertical posts 26, 28, and 30 in a manner depicted in FIGS. 1, 2, and 4.

As shown in FIG. 3, an upper transverse member 34 extends between and interconnects the upper end portions of the rear corner posts 26. A second upper transverse member 34a (shown in FIGS. 7 and 8) extends between and interconnects the upper end portions of the forward corner posts 28. In a preferred form, the transverse members 34 and 34a are identical in construction and each transverse member 34 and 34a has a bore 36 extending therethrough, as clearly shown in FIGS. 7 and 8 with respect to the transverse member 34a. The transverse member 34a is disposed generally on the upper end of each forward corner post 28, and the upper end of each forward corner post 28 is secured to the respective end portion of the transverse member 34a, as shown in FIGS. 7 and 8.

The transverse member 34, which interconnects the rear corner post 26, extends through an aperture provided in each respective post 26, and is secured to each respective post 26 generally about this apertured portion. In this position, it is apparent, that the bore 36 through the transverse member 34 will communicate through each respective end post 26.

In a preferred form, the transverse members 34 and 34a will lie in substantially the same horizontal plane above the runners 24.

A pair of apertures 38 are provided in each respective transverse member 34 and 34a. One such aperture 38 in the transverse member 34a is shown in FIG. 8. Each aperture 38, in the respective transverse member 34 or 34a, is disposed generally near one of the corner posts 26 or 28, and is located generally above the horizontal centerline of each respective transverse member 34 and 34a.

A second pair of apertures 40 are provided in each respective transverse member 34 and 34a, one such aperture 40 is shown in FIG. 8 with respect to the transverse member 34a. Each aperture 40 is located generally below the horizontal centerline of each respective transverse member 34 and 34a. Each aperture 40 is positioned such that the centerline of each aperture 40 is aligned with the centerline of each aperture 38 respectively. The diameter of each aperture 40 is slightly less than the diameter of each aperture 38, for reasons which will be made apparent hereinafter. A pair of step plates 42 are secured to the inner sides of the rear, vertically extending posts 26 at substantially the midportions thereof.

Mounted upon the base structure 22 of the portable collapsible scaffold 12 are a pair of elongated booms, hereinafter termed an outer boom 44 and an inner boom 46. The terms "outer" and "inner" are utilized in describing these booms because of the nested relationship of the booms when they are in their collapsed or inoperative positions as hereinafter further explained. The outer boom 44 includes a pair of elongated, longitudinal members 48 which are interconnected by transverse and diagonal brace members 50 and 52, respectively. The outer boom 44 also includes a second pair of elongated longitudinal members (not shown), which are spaced horizontally from the pair of longitudinal members 48 shown in FIGS. 1 and 2. A plurality of horizontally extending transverse members (not shown) extend between the two uppermost longitudinal members 48 (only one is shown) of the boom 44 and generally support a ladder (not shown). The ladder provides access to a work platform 54, which extends horizontally and interconnects the two upper ends of the booms 44 and 46 as will be described hereinafter.

As shown more clearly in FIGS. 3 and 4, one end of the boom 44 is pivotally connected to the base structure

22, and specifically to the upper end portions of the rear corner posts 26 by means of a pivot bar 56. The pivot bar 56 is journaled in a pair of pillow blocks formed at the upper end of each of the rear corner posts 26. The pillow blocks are formed, such that the boom 44 can be completely disengaged from the upper portions of the rear corner posts 26.

The boom 46, as shown more clearly in FIG. 1, is constructed generally similarly to the boom 44 and thus includes a plurality of longitudinal members 58 (only two are shown), transverse braces 60, diagonal braces 62, and a plurality of transverse, horizontally extending members, which extend between the two upper most longitudinal members 58 (only one is shown) of the boom 44. The horizontal spacing between the pairs of longitudinal members 58 (only one pair is shown) of the boom 46 is less than the horizontal spacing between the corresponding longitudinal members 48 of the boom 44, so that the boom 46 can fit within, or be nested inside of the boom 44 when the two booms are pivoted downwardly to the position depicted in FIG. 2. It will further be noted that one end of the boom 46 is connected in a manner hereinafter described to the work platform 54, while the opposite end of this boom is pivotally connected to the base structure 22. The connection of the boom 46 to the base structure 22 is accomplished by the use of a pivot bar 66 to which the boom 46 is secured and which extends through a pair of pillow blocks secured to the upper ends of the central posts 30. The pillow blocks are constructed similarly to the pillow blocks hereinbefore mentioned, and are constructed to permit the boom 46 to be detached from the base structure 22 and removed from the assembly when desired.

The work platform 54, shown more clearly in FIGS. 5 and 6, includes a rectangular base frame 68. The base frame 68 may be provided with a pair of heavy longitudinal boom attaching beams, which are positioned inwardly on the base frame 68 and connected by a pair of transverse rods. An expanded metal floor grille 69 is included on the base frame 68 and generally supported by the boom attaching beams and the transverse rods.

Disposed on the base frame 68 of the work platform 54 is a pair of side-guard fences 70 and 72. The side guard fences 70 and 72 are disposed on opposite ends of the work platform 54, respectively, and in an opened or operating position, as shown more clearly in FIGS. 1, 5 and 6, each side guard fence 70 and 72 extends generally perpendicular to the base frame 68. Each side guard fence 70 and 72 is pivotally secured to the base frame 68 by a pair of triangularly shaped hinge members 74, which extend generally perpendicular from each side guard fence 70 and 72. The hinge members 74 are secured on the opposite ends of each side guard fence 70 and 72, and each hinge member 74 is disposed generally adjacent the base frame 68. The outer most end portion of each hinge member 74 from the respective side guard fence is pivotally secured to a lug 76, which extends perpendicular to the base frame 68 and is secured on one end portion thereof to the base frame 68. It is apparent from the foregoing that each hinge member 74, and therefore each side guard fence 70 and 72, will pivot about the interconnection between each hinge member 74 and each lug 76 respectively. It is also apparent that, since the interconnection between each hinge member 74 and each lug 76 is offset from the vertical axis of each side guard fence 70 and 72, respectively, that when each side guard fence 70 and 72 is pivoted in a direction 78 (see FIG. 6) generally toward the base frame 68 to a position, wherein each sideguard fence 70 and 72 is generally parallel to the base frame 68, a gap will exist between the base frame 68 and each side guard fence 70 and 72, respectively, for purposes to be described hereinafter.

Each side guard fence 70 and 72, includes a flange portion 80, which extends along one side thereof and is gen-

erally perpendicular to each side guard fence 70 and 72, respectively. As shown more clearly in FIG. 5, each side guard fence 70 and 72 is disposed on the base frame 68, such that the respective flange portions 80 extends from opposite (or nonaligned) ends of each side guard fence 70 and 72, respectively.

A pair of gate members 82 and 84 are pivotally secured to each side guard fence 70 and 72, respectively, on one side of the base frame 68. Each gate member 82 and 84 includes an upper rectangular portion 86 and a post member 88, which extends from one end portion of the rectangular portion 86 of each gate member 82 and 84, respectively, to a position generally adjacent the base frame 68.

One end of each rectangular portion 86 opposite the post member 88 end, of each gate member 82, is pivotally secured to the flange portion 80 of each side guard fence 70 and 72, respectively. Since each flange portion 80 extends a distance from each side guard fence 70 and 72 respectively, when each gate member 82 is pivoted in a direction 90 generally toward each side guard fence 70 and 72, respectively, to a position generally parallel to each respective side guard fence 70 and 72, it is apparent that a gap will exist between each gate member 82 and each side guard fence 70 and 72, respectively.

One end of each rectangular portion 86, opposite the post member 88 and, of each gate member 84 is pivotally secured to one end portion, opposite the flange portion 80 end, of each side guard fence 70 and 72, respectively. It is apparent from the foregoing, that each gate member 84 can be pivoted in a direction 92 generally toward each side guard fence 70 and 72, respectively. In a preferred form, the overall vertical height, from the base frame 68, of each side guard fence 70 and 72 and each gate member 82 and 84, is substantially the same. The horizontal length, with respect to the base frame 68, of each side guard fence 70 and 72 is substantially the same as the respective end of the base frame 68. The horizontal length, with respect to the base frame 68, of each gate member 84 is such that when each gate member 84 is pivoted in a direction 92, to a position adjacent the respective side guard fence 70 and 72, the post member 88 end of each gate member 84 will extend a position near each flange portion 80 of each side guard fence 70 and 72, respectively, but will not contact the flange portion 80. The width of each gate member 84 is slightly less than the distance which each flange member 80 extends from each side guard fence 70 and 72, so that when each gate member is pivoted to a position adjacent each side guard fence 70 and 72, respectively, each respective flange portion 80 will extend slightly beyond each gate member 84, respectively. In a preferred form, the gate members 82 and 84 are constructed identical with respect to form, so that their relative positions on the work platform 54 may be interchanged, for purposes of economy in manufacture.

The length of the base frame 68, extending between the side guard fences 70 and 72, is slightly greater than the overall horizontal length of one of the gate members 82 and one of the gate members 84 combined, so that, in an assembled position as shown in FIGS. 1, 5 and 6, each gate member 82 and each gate member 84 will extend along the length of the base frame 68, generally meeting at the central portion of the base frame.

A retaining plate 94 is secured on each side of the base frame 68 and extends generally perpendicular thereto. Each retaining plate 94 is disposed to arrest the pivotal movement of each gate member 82 and 84 in a direction opposite the directions 90 and 92, respectively, by engaging the post member 88 of each respective gate member 70 and 72.

A latching sleeve 96 is pivotally secured to the upper portion of each gate member 84 by a pin 98. Each latching sleeve 96 has a generally U-shaped cross section so that when each latching sleeve 96 is pivoted downwardly, a portion thereof will receive and engage a portion of each

gate member 82 respectively. It is apparent that in this position of each latching sleeve 96, as shown in FIGS. 5 and 6, each latching sleeve 96 will secure the gate members 82 and 84 in an opened, operative position.

Extending downwardly from the under side of the base frame 68 of the work platform 54 are a pair of boom attachment brackets 100 and 102. It will be noted in referring to FIG. 1 that each of the boom attachment brackets 100 (only one is shown) is pivotally secured through a pin 104 to the inside of the upper ends of the outer boom 44. The other boom attachment brackets 102 in each set are secured to the opposite side of the base frame 68 of the work platform 54, from the boom attaching brackets 100 and are secured by suitable pivot pins 106 to the out-sides of the upper end of the inside boom 46. It will thus be noted that the staggered position of the boom connecting brackets 100 and 102 relative to each other, conjunctively with the smaller transverse dimension of the inside boom 46 as compared to the outside boom 44, permit the two booms to be nested with the inside boom 46 positioned inside the outside boom 44 when both booms are lowered to a substantially horizontally extending position as shown in FIGS. 2 and 4. Moreover, the pivotal axes of the pivot pins 104 and 106 extend parallel to each other, and to the axes of the pivot bars 56 and 66 used to connect the booms 44 and 46 to the base structure 22 so that a parallelogram type arrangement is provided in which the base frame 68 of the work platform 54 is constantly maintained in a horizontal position as the booms 44 and 46 are pivoted upwardly. It may also be pointed out here that at such time as the inner and outer booms 46 and 44, respectively, are pivoted downwardly to their collapsed, substantially horizontally position as shown in FIGS. 1, 3 and 4, the scaffold structure becomes locked in this position and cannot be displaced therefrom by vibration or tilting. Rather, a positive force must be applied on the outer and uppermost of the two booms in order to break this positive interlock and allow the parallelogram type motion to occur.

For the purpose of elevating the booms 44 and 46 to raise the work platform 54 to a desired height, the portable collapsible scaffold 12 of the invention includes a self-contained power plant which includes a prime mover, preferably a gasoline engine 108, which is supported on a suitable support plate 110 mounted on the base structure 22 of the scaffold. The support plate 110 also supports a hydraulic pump 112, which is driven by the engine 108 and supplies hydraulic power fluid through suitable conduits (not shown) to a main piston and cylinder assembly designated generally by reference numeral 114, and to an auxiliary piston and cylinder assembly, designated generally by reference numeral 116, respectively (see FIG. 1).

The piston and cylinder assembly 114 includes an elongated cylinder 118 which is pivotally anchored to the base structure 22. A piston is located in the cylinder 118 and has secured thereto an elongated piston rod 120. The upper end of the piston rod 130 is pivotally secured by a pivot pin 122 to a pair of opposed bracket plates 124 secured to the inner boom 46. The bracket plates 124 also support a transverse cylinder base plate upon which is mounted a short hydraulic cylinder 126 which encloses a piston having secured thereto, and extending from the cylinder, a relatively short piston rod 128. The free upper end of the piston rod 128 bears against one of the cross members of the boom 44 when the booms 44 and 46 are in their collapsed, nested relationship as shown in FIGS. 2 and 4, and functions in a manner hereinafter described for releasing the positive interlock of the booms which is developed when they are in their nested, horizontally extending positions.

A remote control unit 129 is secured to the side guard fence 72 of the work platform 54. The remote control unit 129 is interconnected with the power plant of the portable scaffold 12, such that the elevating and lower-

ing of the booms 44 and 46 may be controlled by an individual standing on the work platform 54.

For the purpose of permitting the portable collapsible scaffold structure 12 to be off-loaded from the vehicle 10, there are provided a plurality of outrigger jacks designated generally by reference numeral 130. Each of the outrigger jacks includes a ground-contacting plate 132 which is secured on the lower end of a threaded shaft 134 which extends upwardly into an internally threaded sleeve 136. A jack handle 138 cooperates with the threaded shaft 134 in such a way that the threaded shaft 134 may be further extended from the sleeve 136 in order to lift the base structure 22 of the scaffolding above the bed of the truck 10 in a manner hereinafter described.

As shown in FIG. 3, a bar 140 is secured to the upper most end of the internally threaded sleeve 136 and extends generally perpendicular thereto. Each bar 140 is shaped to slidingly fit in the bore 36 of the respective transverse members 34 and 34a. The length of the bar 140 is such that the outrigger jacks 130 are spaced outwardly from the sides of the vehicle 10 during the operation of the outrigger jacks 130, as will be described in more detail hereinafter.

As shown in FIGS. 7 and 8, with respect to transverse member 34a, each bar 140 has a bore 142 extending a distance therethrough. An aperture 144 is provided in each bar 140 and is located to be generally above the horizontal centerline of each bar 140. A second aperture 146 is provided in each bar 140 and is located to be generally below the horizontal centerline of each bar 140. Each aperture 146 is in diametric alignment with each aperture 144. The diameter of each aperture 146 is slightly less than the diameter of each aperture 144 and the diameter of each aperture 144 is slightly less than the diameter of the aperture 38 in each respective transverse member 34 and 34a. The apertures 144 and 146 are provided such that, when the bar 140 is inserted a particular distance into the bore 36 of the respective transverse member 34 or 34a, the apertures 144 and 146 will be in alignment with the apertures 38 and 40 of the respective transverse member 34 or 34a.

A clip 148 is secured to each rear corner post 26 and to each forward corner post 28. The slip 148 is sized to securely hold a tapered pin 150 which is disposed therein when not in use, as shown in dashed lines in FIGS. 7 and 8. A chain 152 is secured on one end thereof to the uppermost portion of the tapered pin 150 and the opposite end of the chain 152 is secured to the clip 148. The chain 152 is thus provided to prevent the pin 150 from being lost or misplaced when not in use. The tapered pin 150 is sized to engagingly fit through the apertures 38 and 40 of the respective transverse members 34 and 34a, and through the apertures 144 and 146 of each bar 140, during the operation of the outrigger jacks 130, as will be described hereinafter.

It is apparent from the foregoing that when the tapered pin 150 is removed from the apertures 38, 40, 144 and 146, each bar 140 will rotate and slide axially with the bore 36 of each transverse member 34 and 34a respectively. Therefore each outrigger jack 130 may be rotated and pushed inwardly to a nonoperating position, as shown in FIGS. 1 and 4, in which the outrigger jacks 130 will not interfere with subsequent operations. Each outrigger jack 130 is supported in this nonoperating position by a bracket 154, which is secured to each respective post 30.

OPERATION

Let it be assumed, for the purposes of describing the operation of the portable collapsible scaffold of the invention, that the scaffold structure 12 is mounted on the bed of the pickup truck 10 in the manner depicted in FIG. 2. It will be noted that the transverse dimensions

of the base structure 22 of the scaffold permit it to easily fit between the side walls 16 of the bed of the truck, and the horizontally extending runners 24 allow it to rest flatly and evenly on the bed of the pickup truck 10. In this position, the base structure 22 is secured to the bed of the pickup truck 10 in a manner such that the base structure 22 of the scaffold can be quickly detached entirely from the bed of the pickup truck, and the scaffold can be off-loaded from the truck in a manner hereinafter described.

With the scaffold secured on the truck, the truck can be driven to a location where work is to be performed on an elevated structure, such as a telephone line, light pole, traffic light, or the like. During such transport of the scaffold to the location of the work to be performed, the booms 44 and 46 are pivoted downwardly to the substantially horizontal, nested position which they are shown as occupying in FIG. 2 of the drawings. In this position, the boom 46 is located inside the boom 44 and the work platform 54 extends substantially horizontally and in parallelism with the booms 44 and 46. In this position, a positive interlock of the booms and work platform exists such that an upward force applied to the inner boom 46 would not alone be sufficient to cause the two booms to be pivoted about their respective horizontal pivotal axes. Rather, the result would be a greater binding action tending to prevent further upward movement of the booms, since to break away from the existing interlock, the outer and uppermost boom 44 must be moved upwardly slightly before the parallelogram-type, expanding motion can be smoothly developed.

To the end of permitting the positive interlock to be disengaged, and the booms to pivot upwardly to the position depicted in FIG. 1, the hydraulic piston and cylinder assemblies 114 and 116 are provided. Both of these assemblies are actuated simultaneously by hydraulic power fluid delivered from the pump 112. As the piston rod 120 of the main piston and cylinder assembly 114 is extended, the short piston rod 128 of the auxiliary piston and cylinder assembly 116 is simultaneously extended so that both of the booms 44 and 46 are simultaneously pivoted upwardly about their horizontal axes.

Once the interlock is disengaged by the upward movement of the upper and outer boom 44, the function of the auxiliary piston and cylinder assembly 116 is completed, and the remainder of the upward movement of the booms 44 and 46 can be completed by the use of the main piston and cylinder assembly 114. Accordingly, extension of the piston rod 120 from the cylinder 118 continues until the maximum elevation of the work platform is attained. At this time, the fluid power provided to the cylinder assemblies 114 and 116 is shut off and the booms 44 and 46 are locked in their upraised positions. The vehicle has, of course, been steered so as to position the work platform 54 in the immediate vicinity of the structure which is to be repaired, or the location where work is to be performed by the workman.

The workman next ascends a ladder, which is provided on the upper side of the boom 44, using the foot supports 42 to gain access to this ladder. When the top of the ladder is reached, the workman can pivot the side guard fences 70 and 72 and the respective gate members 82 and 84 to their raised positions and interlock them by means of the latching sleeves 96, in a position as shown in FIGS. 1, 5 and 6. It should be noted at this point that, in some instances, it may be desirable for the workman to open the side guard fences 70 and 72, and the respective gate members 82 and 84 to their operative positions prior to the elevation of the work platform 64 by upward pivotation of the booms 44 and 46. This can be easily accomplished, and the workman can stand upon the work platform 54 during the elevation thereof if this should be desired. When used in this manner, the workman can control the elevating and lowering of the work platform 54 by using the remote control unit 129, which is secured to the work

platform 54. It is therefore apparent, that the entire operation can be performed by a single workman. Using the remote control unit 129, the workman can also vary the height of the work platform 54 to accommodate his position with respect to the particular apparatus being repaired.

Upon completion of the repairs or other operations carried out by a workman standing on the work platform 54 while it is in its elevated position, the work platform 54 can be lowered to the position depicted in FIG. 2, by pivoting the boom 44 and 46 about their horizontal pivotal axes and using a metering valve to bleed hydraulic power fluid slowly out of the pistons. As the power fluid is dispelled from the cylinders, the piston rods 120 and 128 will move into the respective cylinders 118 and 126 under the weight of the booms 44 and 46 and the work platform 54. Thus the booms 44 and 46 will gradually be lowered to their collapsed and nested status.

In this position, the side guard fences 70 and 72, and the respective gate members 82 and 84 will be pivoted to their inoperative status as depicted in FIGS. 2, 3, and 4. Each latching sleeve 96 is pivoted generally upwardly, thereby releasing the engagement between the respective gate members 82 and 84. Each gate member 84 is then pivoted in a direction 92, as shown in FIG. 5, to a position generally adjacent each respective side guard fence 70 and 72. Each gate member 82 is then pivoted in a direction 90 to a position generally adjacent the respective gate member 84. It is apparent, that due to the relative size and positioning of the gate members 82 and 84 with respect to each side guard fence 70 and 72, as described hereinbefore, each gate member 82 and 84 will lie in a position substantially parallel to each respective side guard fence 70 and 72 after each gate member 82 and 84 has been pivoted in the direction 90 and 92 respectively to a position as described hereinabove.

It should be noted that prior to pivotingly closing each gate member 84 of the latching sleeve 96 is pivoted downwardly to a position, wherein the latching sleeve 96 generally engages one side portion of the rectangular portion 86 of each gate member 84. The latching sleeve 96 is retained in this position by the flange portion 80 of each sideguard fence 70 and 72, respectively, when the gate member 84 is pivoted into a closed or inoperative position.

After the gate members 82 and 84 have been pivoted to the closed or inoperative position, the side guard fences 70 and 72 are pivoted in a direction 78, as shown in FIG. 6, to a position generally adjacent the base frame 68 of the work platform 54.

The interconnection between each hinge member 74 and each lug 76, respectively, is such that the gap, which results when each side guard fence 70 and 72 is pivoted to a position substantially parallel to the base frame 68, is slightly greater than combined widths of the two gate members 82 and 84, positioned adjacent each side guard fence 70 and 72, respectively. Therefore, when each side guard fence 70 and 72 is pivoted in the direction 78, to a position parallel to the base frame 68, each gate member 82 will lie generally adjacent the base frame 68, and each sideguard fence 70 and 72, and each gate member 82 and 84 will lie substantially parallel to the base frame 68. The particular overlapping of each side guard fence 70 and 72 and each of the respective gate members 82 and 84, and the offset of the interconnection between each hinge member 74 and each respective lug 76, interacts and cooperates to substantially hold the work platform 54 in the closed or inoperative status, as described hereinabove.

It is apparent that the side guard fences 70 and 72 and the respective gate members 82 and 84 may be pivoted to an assembled or operative position, as shown in FIGS. 1, 5 and 6, from the closed or inoperative position, as shown in FIGS. 2, 3 and 4, by reversing the described fold down procedure.

In many instances, it is desirable to clear the bed of

the pickup truck 10 for other uses, such as hauling various sizes and weights of goods and commodities from one location to another. For this to be accomplished, it is, of course, necessary to remove the portable collapsible scaffold 12 from the pickup truck 10. This may be very quickly and easily accomplished by a single person who may, of course, be the driver of the truck.

To accomplish this, a person need merely lift each outrigger jack 130 from engagement with the respective bracket 154. The bar 140 of each outrigger jack 130 is then slid generally outwardly within the bore 36 of each transverse member 34 and 34a, respectively, to a position wherein each outrigger jack 130 will sufficiently clear the sides 16 of the pickup truck 10. In this position the bar 140 is rotated within the bore 36 of each transverse member 34 and 34a, to rotate each jack 130 to a position wherein each threaded sleeve 136 of each outrigger jack 130 extends generally perpendicular to the projected axis of each respective transverse member 34 and 34a.

The bar 140 of each outrigger jack 130 is then adjustingly rotated and slid within each bore 36 of each respective transverse member 34 and 34a, to a position wherein the apertures 38 and 40 of each transverse member 34 and 34a are aligned with the apertures 144 and 146 of each respective bar 140. Each tapered pin 150 is then removed from the clip 148 and inserted through the aligned apertures 38, 144, 146 and 40, thereby securing each bar 140 in position with respect to each transverse member 34 and 34a, respectively. Since the tapers of the apertures 38, 144, 146 and 40 are sized to matingly fit the taper of the tapered pin 150, as the pin 150 is moved in a generally downwardly direction through the apertures 38, 144, 146 and 40, the engagement of the pin 150 in said apertures will become increasingly tighter. Further, since the tapered pin 150 is initially inserted through the aperture 38, which is located above the horizontal centerline of the respective transverse member 34 and 34a, the general disposition of the pin 150 in the apertures 38, 144, 146 and 40 (as shown in FIG. 8) is such that any movement at the tapered pin 150 will be in a generally downwardly direction, thereby generally increasing the tightness of the fit therebetween.

It is apparent from the foregoing, that any movement of the bar 140 of the outrigger jack 130 within the above 36 of the respective transverse member 34 or 34a will result in the tapered pin 140 moving in a generally downward direction and, thus increasing the tightness of the fit of the tapered pin 150 as described hereinbefore. Therefore during the operation of each outrigger jack 130, secure engagement of each outrigger jack 130 with the base structure 22 is virtually assured, thereby providing a safe interconnection between each outrigger jack 130 and the base structure 22.

It is apparent from the foregoing, that in the operating position of the outrigger jacks 130, as shown in FIGS. 2 and 3, there are four outrigger jacks 130 located at the four corners of the base structure 22 of the scaffold 12. The operator may then pass from jack to jack and by turning each of the handles 138 on the several jacks in equal relatively small incremental amounts a number of consecutive times, the portable collapsible scaffold 12 can be lifted from the bed of the pickup truck 10. If the tailgate of the pickup truck 10 is then lowered, the pickup truck 10 may simply be driven out from under the runners 24 of the base structure 22 of the scaffold 12, to leave the scaffold 12 supported in the air by the four outrigger jacks 130. Occasionally it may be desirable to use the scaffold 12 while it is thus supported on the outrigger jacks 130, and this may be successfully accomplished due to the sufficiency of the counterbalancing weight afforded by the base structure 22.

It should also here be noted that by slight modification of the structure of the jacks 130 from that which is illustrated in the drawings, the entire scaffold 12 may be completely lowered to the ground by consecutively

turning the handles 138 of each outrigger jack 130 so as to shorten the outrigger jacks 130 until the runners 24 rest upon the ground. The outrigger jacks 130, and more particularly each bar 140 of each outrigger jack 130 may then be removed from engagement with each respective transverse member 34 and 34a, by first removing the tapered pin 150 and then sliding each bar 140 in a generally outwardly direction along the bore 36 of each respective transverse member 34 and 34a until each bar 140 is completely removed therefrom.

In this position of the scaffold structure 12, as shown in FIG. 4, it will be noted that the self-contained power plant, which includes the engine 108, the hydraulic pump 112 and the piston and cylinder assemblies 114 and 116, is still present in its same location on the base structure 22, and can be utilized while the scaffold 12 is rested on the ground for elevating the booms 44 and 46. Thus, the scaffold 12 can still be employed in the location at which it is rested upon the ground for moving the work platform 54 to a relatively high vertical level to permit access to be gained to structures upon which repairs are to be effected.

Loading of the scaffold 12 on the vehicle and securement on the bed thereof is achieved in precisely the reverse manner to that in which the scaffold 12 is off-loaded from the vehicle as hereinbefore described. A single person may accomplish such loading without difficulty.

Although a preferred embodiment of the portable collapsible scaffold of the invention has been described in order to permit its construction and operation to be clearly understood by those having ordinary skill in the art, it is to be understood that various changes and modifications may be made to the depicted structure without departure from the basic principles upon which the invention is based. All changes and modifications of this type are therefore deemed to be circumscribed by the spirit and scope of the invention.

What is claimed is:

1. A portable, collapsible scaffold structure for mounting on a self powered vehicle comprising:
 - a base structure adapted to be detachably secured to the bed of the self powered vehicle, having a forward end portion and a rear end portion;
 - a plurality of transverse members extending generally horizontally across said base structure and secured to said base structure;
 - outrigger jacks detachably engaging said transverse members, each outrigger jack including:
 - an elongated sleeve, having an upper end portion and a lower end portion;
 - a ground contacting portion adjustably engaging a lower end portion of the elongated sleeve, whereby the height of the elongated sleeve is adjustable by raising and lowering the ground contacting portion;
 - a bar having an end portion secured to the upper end portion of the elongated sleeve and having the opposite end thereof slidingly engaging one of said transverse members;
 - means detachably securing each bar in position with respect to each transverse member;
 - a pair of elongated boom elements, each pivotally secured at one end to the base structure; and
 - a horizontally extending work platform comprising:
 - a generally rectangularly shaped base frame pivotally secured to the ends of said booms opposite their ends pivotally secured to said base structure;
 - a pair of side guard fences extending generally perpendicular to the base frame, in one position thereof, and each side guard fence pivotally secured to one side of said base frame in such a manner that when each side guard fence is pivoted to a position generally parallel to said

base frame, a gap exists between each side guard fence and said base frame;

- a pair of gate members pivotally secured to opposite ends of each side guard fence, one of the gate members in each pair being pivotable to a position generally adjacent and parallel the respective side guard fence, and the other of said gate members in each pair being pivotable to a position generally adjacent the opposite gate member and such that, in this position, the respective pair of gate members generally occupy the gap between the respective side guard fence to which they are secured and the base frame when each side guard fence is pivoted to a position generally parallel to said base frame; and means for elevating and lowering the booms by pivotation about said horizontal axes.

2. A scaffold structure as defined in claim 1 wherein said boom elements are substantially parallel and are secured to said base structure at horizontally spaced locations from each other for pivotation about spaced, substantially parallel, horizontal axes.

3. A scaffold structure as defined in claim 1, wherein said boom elements are substantially parallel, and are secured at one end to the rear portion of the base structure, said boom elements being secured to said base structure at horizontally spaced locations for pivotation about spaced, substantially parallel horizontal axes, one of said boom elements having its horizontal pivotal axis forward of the horizontal pivotal axis of the other boom element and being of a lesser transverse dimension than said other boom element, and said boom elements being dimensioned to nest in a horizontally extending position of substantially coplanar alignment.

4. A scaffold structure as defined in claim 2, wherein the work platform forms a parallelogram with said booms and base structure when said booms are pivoted upwardly.

5. A scaffold structure as defined in claim 3, wherein the work platform forms a parallelogram with said booms and base structure when said booms are pivoted upwardly, and wherein said work platform occupies a position in substantially coplanar alignment with said nested booms.

6. Scaffold structure as defined in claim 1, wherein the means to provide power for elevating and lowering the booms includes:

extensible piston and cylinder means connected between said base structure and at least one of the booms to provide power for elevating and lowering both booms simultaneously about said horizontal axes; and

means for supplying power fluid to said piston and cylinder means mounted on said base structure.

7. The scaffold structure of claim 1, wherein each of said bars is tubular and has a pair of apertures, oppositely disposed and in substantial alignment; and wherein each transverse member is tubular and includes a pair of apertures oppositely disposed and in substantial alignment, such that in one position of each bar in the bore of each transverse member, the apertures in each bar are substantially aligned with the apertures in each respective transverse member, and; further wherein the means to secure each bar in position with respect to each respective transverse member includes a pin disposed through said apertures in each respective transverse member and through said aligned apertures in each respective bar.

8. The scaffold structure of claim 1, wherein each side guard fence of the work platform includes, a flange portion on one side thereof extending generally perpendicular to said side guard fence, one of said gate members being pivotally secured to each of said flange portions, said flange portion sized such that when one of said gate members is pivoted to the position generally adjacent and parallel to each side guard fence, the opposite gate member

can then be pivoted to a position generally adjacent and parallel the other said gate member.

9. The scaffold structure of claim 8, wherein the horizontal length of each of said gate members is slightly less than the horizontal length of each side guard fence respectively, such that when one gate member is pivoted to a position parallel to the respective side guard fence, said gate member will not interfere with the other of said gate members.

10. The scaffold structure of claim 9, wherein the combined horizontal width of the pair of gate members is slightly less than the gap between each side guard fence and the base frame, such that when each side guard fence is pivoted to a position substantially parallel to the base structure, each of said gate members will be substantially parallel to said base frame and one of said gate members of each side guard fence will be adjacent the base frame.

11. A portable, collapsible scaffold structure for mounting on a self powered vehicle comprising:

a base structure having a forward end portion and a rear end portion;

a plurality of transverse members extending generally horizontally across said base structure and secured to said base structure, each transverse member having a bore therein;

outrigger jacks detachably engaging said transverse members, each outrigger jack including:

an elongated sleeve having an upper end portion and a lower end portion;

a ground contacting portion adjustably engaging a lower end portion of the elongated sleeves whereby the height of the elongated sleeve is adjustable by raising and lowering the ground contacting portion;

a bar, having a bore extending a distance there-through, secured on one end portion thereof to the uppermost end portion of the elongated sleeve and having the opposite end thereof slidingly disposed in the bore of each transverse member;

means to secure each bar in position with respect to each transverse member;

boom means having an end pivotally secured to the base structure;

a horizontally extending work platform pivotally secured to said boom means at an end opposite its end pivotally secured to said base structure; and

means for elevating and lowering said boom means by pivotation about said horizontal axis.

12. The scaffold structure of claim 11, wherein each bar includes a pair of apertures, oppositely disposed and in substantial alignment; and wherein each transverse member includes a pair of apertures oppositely disposed and in substantial alignment such that in one position of each bar in the bore of each transverse member, the apertures in each bar are substantially aligned with the apertures in each respective transverse member; and further wherein the means to secure each bar in position with respect to each respective transverse member, includes a pin disposed through said apertures in each respective transverse member and through said apertures in each respective bar.

13. The scaffold structure of claim 12 wherein one of the apertures in each transverse member is disposed above the horizontal centerline of said transverse member so that when the pin is disposed first through said aperture so disposed above said horizontal centerline and then through the remaining apertures in each respective transverse member and through the apertures in each respective bar, the pin will be disposed in a generally downward direction.

14. The scaffold structure of claim 13 wherein the apertures in each bar and the apertures in each respective transverse member are provided to matingly fit the shape of the pin being inserted therethrough.

15. The scaffold structure of claim 14 wherein the shape of the pin is tapered so that any movement of the bar or the transverse member will result in the pin more tightly engaging said apertures.

16. The scaffold structure of claim 11 wherein there are four outrigger jacks, two of said jacks being disposed on the opposite sides forward end portion, and two of said jacks being disposed on the opposite sides of the rear end portion respectively, of said base structure.

17. A portable, collapsible scaffold structure for mounting on a self powered vehicle comprising:

a base structure having a forward end portion and a rear end portion;

elongated boom means pivotally secured at one end to the base structure;

a horizontally extending work platform comprising:

a generally rectangularly shaped base frame pivotally secured to the end of said boom means opposite its end pivotally secured to said base structure;

a pair of side guard fences extending generally perpendicular to the base frame, in one position thereof, and each side guard fence pivotally secured to one side of said base frame in such a manner that when each side guard fence is pivoted to a position generally parallel to said base frame, a gap exists between each side guard fence and said base frame;

a pair of gate members pivotally secured to opposite ends of one of said side guard fence, each gate member being sized such that one of said gate members in each pair can be pivoted to a position generally adjacent and parallel to the respective side guard fence to which it is secured, and the other of said gate members in each pair of gate members can be pivoted to a position generally adjacent the opposite gate member, and such that, in this position, the pair of gate members generally occupy the gap between the guard fence to which they are pivotally secured and the base frame when each side guard fence is pivoted to a position generally parallel to said base frame;

means for elevating and lowering said boom means by pivotation on said base structure; and

means connected to said base structure for elevating said base structure with respect to the ground to permit said self powered vehicle to be detached and driven from under said portable collapsible scaffold structure.

References Cited

UNITED STATES PATENTS

| | | | |
|-----------|---------|-----------------|---------|
| 2,196,511 | 4/1940 | Wagner | 182—113 |
| 2,362,170 | 11/1944 | Swaisgood | 182—2 |
| 3,176,792 | 4/1965 | Olson | 182—2 |
| 3,252,542 | 5/1966 | Thornton et al. | 182—2 |
| 3,253,677 | 5/1966 | Krynytzky | 182—2 |
| 3,283,850 | 11/1966 | Jones | 182—2 |
| 3,472,337 | 10/1969 | Atchey | 182—2 |

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