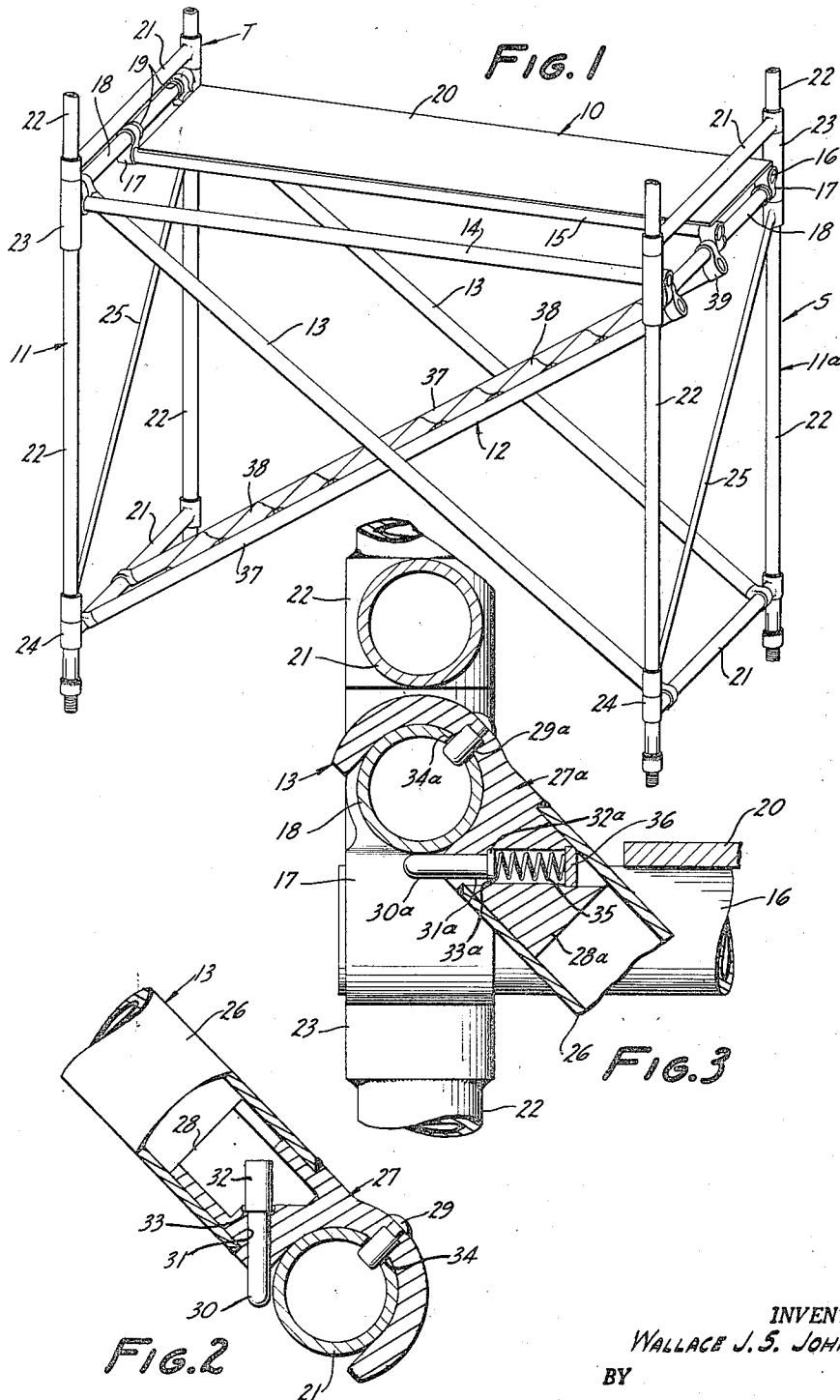


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PORTABLE SCAFFOLD UNIT

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PORTABLE SCAFFOLD UNIT

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The present invention pertains to scaffolds used by builders and the like, and more particularly to scaffolds of the portable type.

It is an object of the present invention to provide an improved manner of bracing a scaffold unit, and to facilitate assembling and dismantling of diagonal braces to other parts comprising the scaffold unit.

Another object of the invention is to provide a locking mechanism for securing a diagonal brace to other parts of the scaffold unit, which cannot be released inadvertently to allow disconnection or disengagement of the brace.

One form which the invention may assume is exemplified in the following description and illustrated by way of example in the accompanying drawings, in which:

Fig. 1 is a perspective view of a scaffold unit embodying one form of the present invention.

Fig. 2 is a longitudinal section through the lower end of one of the diagonal braces, disclosing the elements for locking such brace to an end section of the scaffold unit.

Fig. 3 is a partial sectional and elevational view through the upper end of a diagonal brace disclosing the manner of securing it in locked position to an end section of the scaffold unit.

The general scaffold unit S is essentially the same as the one described in the application of Wallace J. S. Johnson and Thomas H. Harvey, Serial No. 678,790, filed June 24, 1946, which is now Patent No. 2,438,173, dated March 23, 1948, for "Portable and Collapsible Scaffolding Unit." As described in that application, the scaffold unit comprises an upper platform section 10, end sections 11, 11a and a ladder or stairway section 12. In addition, the present scaffold unit includes one or more diagonal braces 13. The platform section 10 comprises three parallel longitudinal frame members 14, 15, 16, the outer frame members 14, 16 being located at opposite sides of the platform and on opposite sides of the intermediate frame member 15.

Each of the opposite ends of each frame member 14, 15, 16 is welded, or otherwise firmly secured, to a trunnion 17 rotatably mounted on an upper transverse frame member 18 of an adjacent end or supporting section 11, 11a, thus forming an articulated connection between the platform section 10 and the upper ends of the supporting or end sections 11, 11a. Suitable collars 19 are welded on the frame members of the end sections to prevent lateral movement or displacement of the frame members 14, 15, 16 along the upper transverse members 18.

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A flat flooring 20 is secured on the platform section overlying one of the outer and the intermediate frame members 14, 15. This flooring may be of plywood, or any other suitable material of sufficient strength to support the weight of workmen, or to suit conditions to which the scaffold unit is to be subjected.

Each of the end or supporting frames or sections 11, 11a comprises, in addition to its upper transverse frame member 18, a lower transverse frame member 21 and a pair of upright parallel supporting legs 22. The upper frame members 18 are welded at their ends to vertical sockets 23 suitably secured, as by welding to the upper ends of the legs 22, while the lower frame members 21 are welded to collars 24 secured on the lower portions of the legs, as by welding or the like, above the lowermost ends of such legs. For the purpose of rigidity and strength, each end or supporting section 11, 11a includes a diagonal brace 25 extending between its legs.

The scaffold unit also includes a ladder or stairway section 12, which provides a dual purpose of enabling workmen to ascend or descend from the lower to the upper end of the unit, and it likewise serves as a diagonal brace for the unit. In addition, other diagonal braces 13 are provided between the lower transverse member 21 of one end section 11a and the upper transverse member 18 of the other section 11. These last-mentioned diagonal braces are arranged oppositely to the ladder brace 12.

As explained in the application above referred to, upon removal of the diagonal braces 13 from the end sections, the end sections 11, 11a, platform sections 10 and ladder sections 12 may be collapsed to a comparatively flat position by folding one end section 11 against one side of the platform and ladder sections 10, 12 and the other end section 11a against the other side of the platform and ladder sections, enabling the end, platform and ladder sections to be transported conveniently as a unit.

Each diagonal brace 13 includes a tubular member 26 having a hook 27 or 27a secured to each end, the shank portion 28 of the hook being piloted into the end of the tubular member and the two parts then welded together. A locating pin 29 is secured in the central portion of the hook and extends inwardly to its interior. Disposed at an angle to the locating pin is a locking pin 30 slidable within a bore or hole 31 in the shank 28a, the outer movement of such pin being limited by engagement of its head 32 with an inner stop surface 33 on the shank.

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At the bottom end of the brace 13, the locking pin 30 and the bore 31 in which it is slidable are so disposed on the shank that they occupy a generally vertical position when the diagonal brace is secured to the lower transverse member 21 of an end section 11a. Such lower transverse member has a hole 34 adapted to receive the locating pin 29 when the lower hook portion 27 of a diagonal brace is disposed thereover. This definitely determines the position of the diagonal brace 13 longitudinally of the lower transverse member 21. During placing of the hook portion over the lower transverse member, the locking pin 30 is retracted within the hook shank 28 until the locating pin 29 is disposed within the co-operable hole 34 on the lower transverse member 21 and the hook engaged fully around the latter, whereupon the locking pin 30 is released for gravitational projection from the shank hole 31 into a position adjacent the exterior of the lower transverse member 21. It is evident that the locking pin 30, by extending across the open side of the hook 27 and transversely across the lower member 21, prevents movement of the hook in a diagonally upward direction, which would disengage it from the lower transverse member. Accordingly, the hook 27 is held from removal from the lower transverse member 21 until the vertical locking pin 30 is moved upwardly within the shank 28 to a position clear of the lower transverse member, whereupon the hook portion 27 of the diagonal brace 13 may be moved outwardly to shift its locating pin 29 from its co-operable hole 34 and itself from the lower transverse member.

The upper portion of each diagonal brace 13 is formed similarly to the lower portion by piloting the shank portion 28a of a hook within the diagonal tubular member 26 and welding the two parts together. The upper hook 27a is adapted to be engaged over the upper transverse member 18 of the opposite end section 11 of the scaffold unit, being provided with a locating pin 29a adapted to be received within a hole 34a in the upper transverse member spaced from the leg 22 of the end section substantially the same distance as the corresponding hole 34 on the lower transverse member 21 of the other end section is spaced from its adjacent leg 22. Instead of being disposed substantially vertically, as the pin 30 at the lower end of the diagonal brace, the locking pin 30a is disposed in a generally horizontal position, extending through a hole 31a in the shank portion of the hook, with its head 32a engaging a stop shoulder 33a in the shank, the pin 30a being urged to an outer position by a spring 35 compressed between its head end 32a and a retainer 36 suitably secured to the shank.

In assembling the upper end of the brace 13 on the upper transverse member 18, the pin 30a is retracted against the force of the spring 35 and the hook 27a placed around the transverse member 18 with the locating pin 29a inserted within its co-operable upper transverse member hole 34a. Thereafter, the pressure on the locating pin 30a may be released to allow the spring 35 to project it outwardly under the upper transverse member 18 and partially across the open side of the hook 27a.

It is apparent that the upper end of the brace cannot be removed from its assembled relation on the upper transverse member 18, since the movement of the hook 27a diagonally from the latter is prevented by engagement of the pin 30a with the undersurface of the transverse member 18.

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The only way in which the hook can be dismantled from the upper transverse member is to first retract the horizontal pin 30a against the spring force, which then permits disconnection and removal of the hook from the transverse member.

The ladder or stairway section 12, which also serves as a diagonal brace, includes two parallel tubular ladder bars 37 to which steps or rungs 38 are welded. The upper ends of these ladder bars are secured to trunnions 39 rotatable on the upper transverse member 18 of one end section 11a, their lower ends being secured to the lower transverse member 21 of the other end section 11 by providing a hook and pin arrangement on them substantially the same as on the lower ends of the diagonal braces 13.

By virtue of the construction of the diagonal braces 13, they may be assembled or secured rapidly to the upper and lower transverse members 18, 21 of the end sections, with assurance that they cannot be removed inadvertently, in view of the locking action of the vertical and horizontal pins 30, 30a.

In the event that a single scaffold unit is employed, the end of the flooring 20 of the platform is disposed sufficiently close to the upper hook end 27a of one of the diagonal braces as to prevent upward movement of such end from its co-operable upper transverse member 18, despite retraction of the horizontal pin 30a. The clearance between the end of floor 20 and the uppermost portion of the hook 27a is relatively small, of the order of about $\frac{1}{8}$ " which prevents disengagement of the brace 13 from the upper transverse member 18, so long as the flooring is in place.

A second scaffold unit T may be disposed upon the first scaffold unit S by piloting its legs 22 within the sockets 23 provided on the upper ends of the legs 22 of the first unit. The lower transverse member 21 of the upper unit will be disposed closely adjacent the upper hook ends 27a of the diagonal braces 13, with very little clearance therebetween. Accordingly, retraction of the horizontal pins 32a, with the upper scaffold unit T in place, still does not allow removal of the diagonal braces 13, since attempts to elevate their hook ends will effect their engagement with the lower transverse members 21 of the upper unit, and preclude their disconnection from the upper member 18 of the lower unit S. Accordingly, since the diagonal braces 13 cannot be removed, so long as an upper scaffold unit T is disposed upon a lower scaffold unit S, assurance is had against inadvertent collapsing of the latter.

It is, accordingly, apparent that an improved locking device for the brace members of a scaffold unit has been provided, which enables the braces to be assembled and dismantled from the unit very readily, and which cannot be inadvertently released to allow disconnection or disengagement of the braces from its co-operable parts.

While I have illustrated and described my invention in detail, it is to be understood that various changes may be made therein by those skilled in the art without departing from the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A scaffold structure, including a lower scaffold unit having spaced end sections, each section including upper and lower transverse members, a diagonal brace extending between

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said sections, said brace comprising hooks at its ends attachable to the upper transverse member of one section and the lower transverse member of the other section, and an upper scaffold unit similar to the lower unit and mounted upon said lower scaffold unit to dispose one of its transverse members in close proximity to the hook attachable to said upper transverse member to prevent disconnection of said upper hook therefrom, the shortest distance between said one transverse member of the upper unit and said hook being substantially less than the diameter of said upper transverse member.

2. In a dismantlable tubular scaffolding, a coupling comprising a generally hook-shaped member adapted to be placed onto a tubular scaffold member to partially embrace the same, said hook-shaped member having a base portion and spaced flanks, a locking pin rectilinearly retractable within one of said flanks and serving to at least partially bridge the gap between said flanks when in extended position, and arranged for automatic retraction upon placement of the hook-shaped member on, and the consequent pin engagement with, a tubular scaffold member, said locking pin having its axis extending outwardly in the same general direction as the hook-shaped member opens, but angularly to said direction so as to intersect the other flank if extended, so that the locking pin is pushed inwardly by engagement with a tubular scaffold member when the hook-shaped member is placed on the same, the angle made by the axis of the locking pin with the direction in which the hook-shaped member opens being in the neighborhood of a medial acute angle, and a locating pin fixed to said base portion and extending inwardly of said hook-shaped member to fit within a mating hole of the tubular scaffold member when the hook-shaped member is placed thereon.

3. A coupling device for dismantlable scaffold units comprising a generally hook-shaped member adapted to be placed onto a tubular scaffold member to partially embrace the same, said hook-shaped member having a base portion and spaced flanks, a locking pin rectilinearly retractable within one of said flanks and serving to at least partially bridge the gap between said flanks when in extended position, and arranged for automatic retraction upon placement of the hook-shaped member on, and the consequent pin engagement with, a tubular scaffold member, said locking pin having its axis extending outwardly in the same general direction as the hook-shaped member opens, but angularly to said direction so as to intersect the other flank if extended, so that the locking pin is pushed inwardly by engagement with a tubular scaffold member when the hook-shaped member is placed on the same, the angle made by the axis of the locking pin with the direction in which the hook-shaped member opens being in the neighborhood of a medial acute angle, spring means urging the pin outwardly, and means for limiting outward movement of the pin.

4. In a dismantlable scaffolding having tubular brace sections, a coupling comprising a body having a shank portion secured within an end of a tubular brace section in axial alignment therewith and provided with a bore extending through the shank portion at an acute angle to the axis of the brace, said bore opening outwardly at a point slightly spaced from the end of the brace, a hook-shaped portion upon the body opening outwardly at right angles to the axis of

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the shank and brace and arranged to seat upon a second tubular section disposed at right angles to the brace section, interengageable pin and socket means upon the hook portion and the tubular section engaged thereby for positioning the coupling longitudinally of said tubular section and preventing relative rotation thereof, and latch means mounted in the bore of the shank and operable for releasably holding the hook portion in seated position upon the second tubular section.

5. In a dismantlable scaffolding having tubular brace sections, a coupling comprising a body having a shank portion secured within an end of a tubular brace section in axial alignment therewith and provided with a bore extending through the shank portion at an acute angle to the axis of the brace, said bore opening outwardly at a point slightly spaced from the end of the brace, a hook-shaped portion upon the body opening outwardly at right angles to the axis of the shank and brace and arranged to seat upon a second tubular section disposed at right angles to the brace section, interengageable pin and socket means upon the hook portion and the tubular section engaged thereby for positioning the coupling longitudinally of said tubular section and preventing relative rotation thereof, a latch pin slidably mounted in the bore of the shank and extendable angularly partially across the open side of the hook portion in retaining engagement with the second tubular section, means limiting outward movement of the pin, and a spring normally urging the latch pin outwardly, the pin being disposed at an angle to the hook portion such as to permit inward displacement of the pin by engagement with the second tubular section as the hook is moved to seating position thereon while requiring manual displacement of the pin to permit unseating movement of the hook.

6. In a dismantlable tubular scaffold structure, a lower unit having a transverse member, a diagonal brace provided with a coupling member dismantlably engaging the transverse member, said coupling member having a hook portion seating upon the transverse member, interengaging pin and socket means upon the hook portion and transverse member for positioning the coupling upon the transverse member and preventing relative rotation thereof, spring actuated latch means carried by the coupling member at an angle permitting inward displacement by engagement with the transverse member to permit movement of said member to seating position and requiring manual displacement to permit outward movement of the transverse member from its seated position, and an upper unit having a transverse member parallel to the transverse member of the lower unit and spaced therefrom to prevent displacement of the coupling member therefrom while the scaffold units are in assembled relation.

7. A coupling member for detachably connecting tubular brace sections of a dismantlable scaffolding comprising a body having a hook-shaped portion opening laterally from one side of the body for detachably engaging a tubular brace section, a shank extending axially from the hook portion and having a shoulder providing a seat for the end of a tubular brace section to be connected to a brace section engaged by the hook portion, said shank also having a bore extending through the shank at an acute angle from a point back of the shoulder to a point positioned outwardly from the shoulder; said bore opening adjacent the open

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side of the hook portion and having a counter bore providing an internal shoulder, a latch pin slidably mounted in the bore and extendable therefrom at an acute angle partially across the open side of the hook portion, a shoulder upon the pin engageable with the internal shoulder for seating the pin in latching position, and spring means normally urging the pin to latching position and displaceable by movement of the hook portion onto the brace section to admit the brace section into the hook portion.

WALLACE J. S. JOHNSON.

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