Oct. 20, 1953 P. GRAY 2,656,224

SCAFFOLD CLAMPING DEVICE

Filed Dec. 14, 1948 2 Sheets-Sheet 1

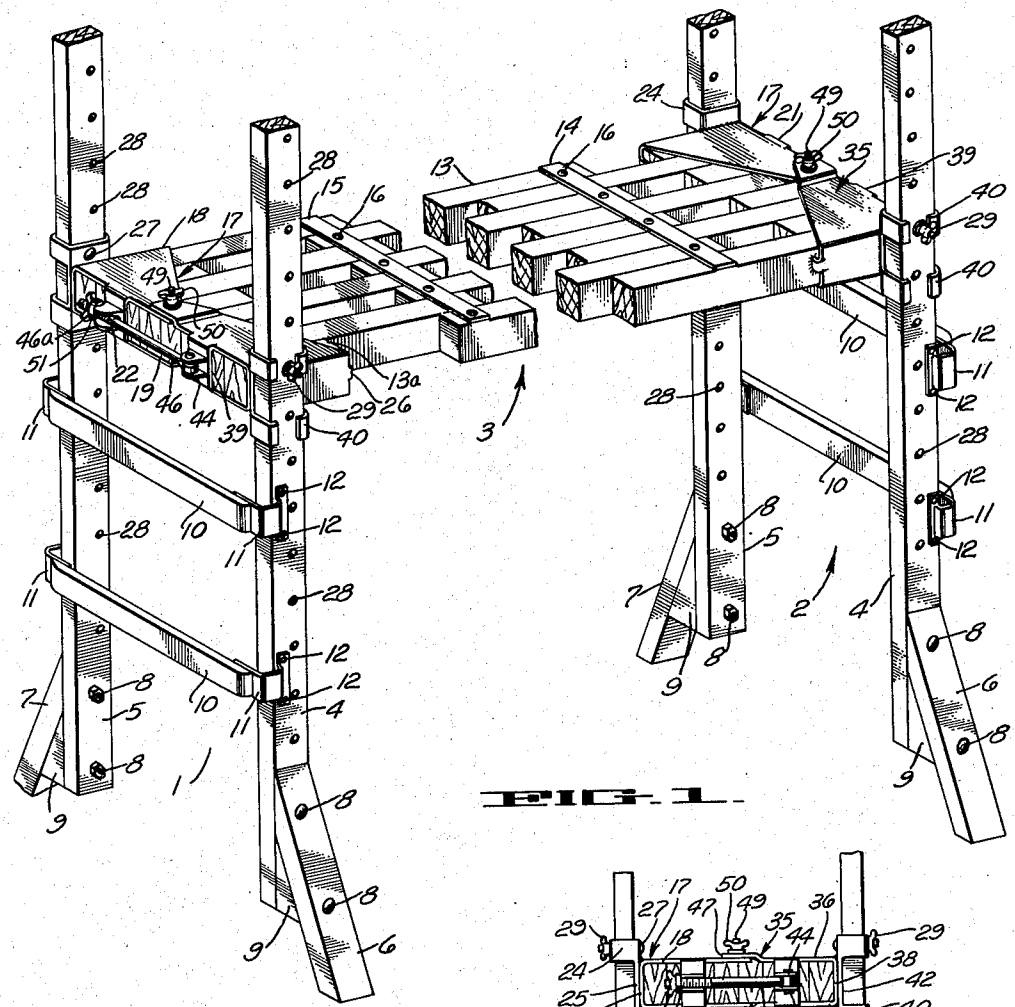


FIG. 1.

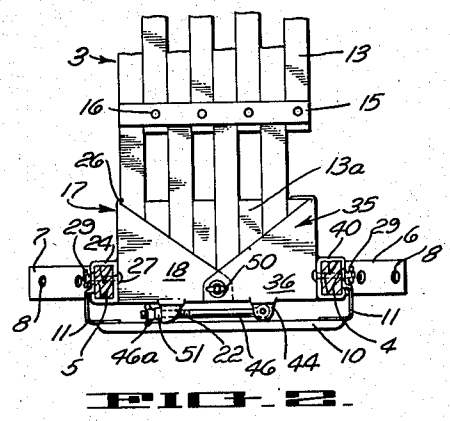


FIG. 2.

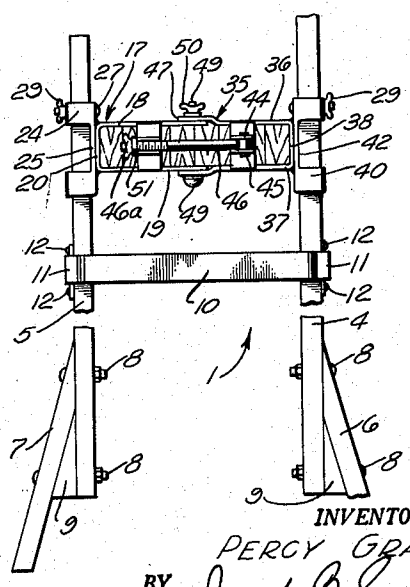


FIG. 3.

INVENTOR.
PERCY GRAY
BY Joseph B. Gardner
atty.

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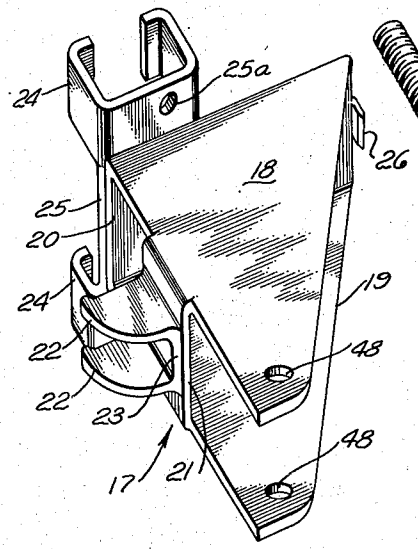


FIG. 4

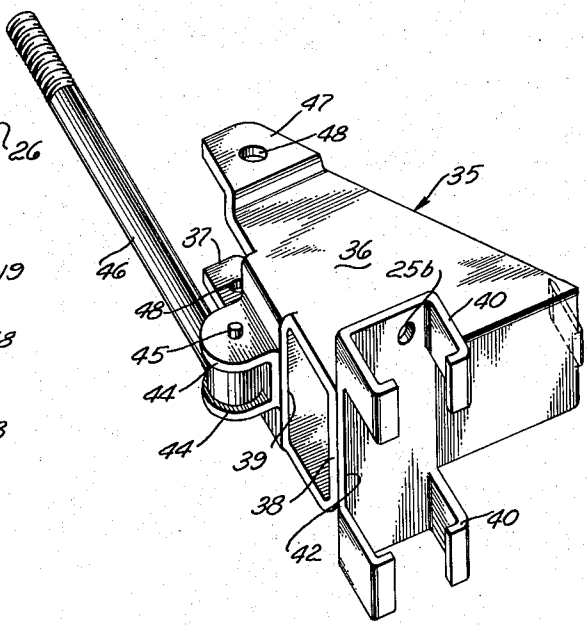


FIG. 5

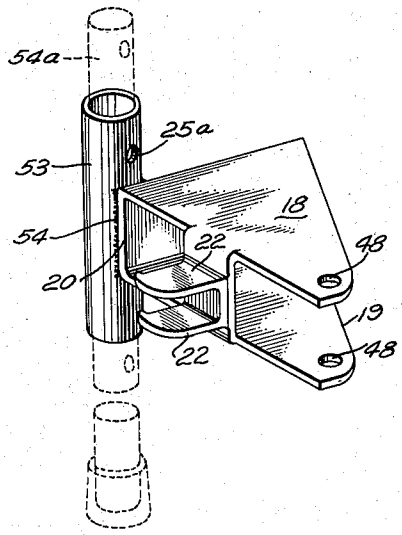


FIG. 6

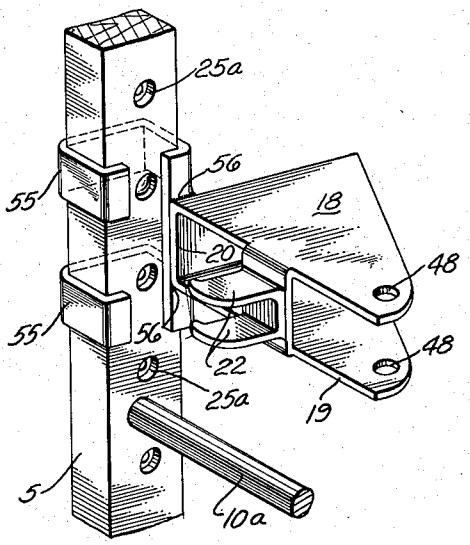


FIG. 7

INVENTOR.
PERCY GRAY
BY Joseph D. Gaidner
atty.

Patented Oct. 20, 1953

2,656,224

UNITED STATES PATENT OFFICE

2,656,224

SCAFFOLD CLAMPING DEVICE

Percy Gray, Richmond, Calif., assignor of one-half to William Gray, Washington, D. C.

Application December 14, 1948, Serial No. 65,232

2 Claims. (Cl. 304—40)

1

This invention relates to working stages or scaffolds used in various trades for supporting workmen at desired levels above the ground as in painting the side walls of buildings, and other operations requiring the safe support of one or more artisans above ground level. Scaffolds are also required in the work of paper hangers, lathers and other interior craftsmen for providing convenient and dependable access to the upper portions of vertical walls and to ceilings. Whether the scaffold is supported from the ground level or is suspended from above depends chiefly upon the nature and requirements of the work being performed, both types being widely used. Since the load capacity of a scaffold should safely be such as to sustain as many workmen as can be accommodated thereon since it is not unlikely that at one time or another this situation will be encountered, the greatest attention in the past has been given to structural strength. Other factors are ready erection, adjustability to various levels when required, horizontal extensibility and compactness, both in the erected and in the dismantled condition.

While the foregoing conditions have been met in a reasonable degree by the prior art constructions and many of such have done so with desirable elimination of excess weight, there are other important requirements in a scaffold that have not, to my knowledge, been recognized or at least solved by such constructions. A prime requirement of a scaffold whether supported from the ground or suspended from above is easy extensibility of the horizontal stage without impairment of the inherent rigidity of the scaffold or deformation of its members. Maximum safety in a scaffold is accomplished by providing such inherent rigidity through a unitary immobile assembly of the horizontal stage and the vertical supports for the same, thus not only providing a structure that is actually as strong as the components thereof, but is the safest in use since workmen have at all times and under all conditions of use, complete confidence in the perfect functioning of the structure. To accomplish the foregoing with due regard for minimum overall weight dictates the use of wood or light metal at all but the points of joinder where excess stresses require the use of reinforced flange members of stronger metal such as steel. It is furthermore quite important that the scaffold design be such that it may be quickly erected and dismantled. The improved scaffold now to be described fulfills the foregoing requirements in an eminently satisfactory manner.

2

It is therefore a principal object of this invention to provide a new and improved scaffold or working stage.

Another object of the invention is to provide a scaffold in which the horizontal platform may be readily extended as desired without impairing its normal rigid connection with the vertical, side supports.

Another object of the invention is to provide a scaffold in which the working horizontal platform is rigid with the supporting side members under all conditions of use.

A further object of the invention is to provide a scaffold that is safe under all conditions of use due to the fact that the horizontal platform can not be dislodged from its anchorage with the side supports after its adjustment with respect thereto.

Another object of the invention is to provide a scaffold that may be readily adjusted to provide a horizontal working platform even when supported on uneven ground.

Another object of the invention is to provide a unitary and easily adjusted scaffold clamp for rigidly uniting the horizontal platform and one of the vertical, side supports.

A still further object is to provide a scaffold that is laterally quite stable in addition to its stability in the longitudinal directon of the horizontal stage.

A still further object is to provide a scaffold clamp which serves to unite as an integral rigid unit a ladder member of usual type and conventional planking constituting the working platform thereof.

Another object is to provide a rigid scaffold assembly of end ladder member and working platform adapted for use with an ordinary ladder as the other end member thereof.

Another object of the invention is to provide a readily adjustable, rigid scaffold that may be adjusted or moved as required by a single workman.

The invention possesses other objects and advantages, some of which together with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and form part of the specification. It is to be understood, however, that variations in the showing made by the said drawings and description may be adapted within the scope of the invention as set forth in the claims.

Referring to the drawings:

Figure 1 is a perspective view of one form of my improved scaffold,

Figure 2 is a plan view of the left end portion of Figure 1,

Figure 3 is an end elevation taken from the left of Figure 1,

Figure 4 is a perspective view of a preferred form of clamp member such as is also shown at the left of Figures 1, 2 and 3,

Figure 5 is a similar perspective view of the companion clamp member shown also at the right of Figures 1, 2 and 3,

Figure 6 is a perspective view of a modified form of clamp similar to that of Figure 4 but designed for use with a tubular form of vertical support, and

Figure 7 is a modification of the form of clamp shown in Figure 4.

Reference is now made to Figure 1 wherein it will be noted that the improved scaffold of this invention comprises a pair of spaced, vertical supports 1 suitably spaced from an identical pair of spaced, vertical supports 2 and rigidly united to a horizontal stage or working platform 3 disposed therebetween. The pairs of vertical supports 1, 2 may be conveniently referred to as ladders from their general configuration, but as will later appear their function goes considerably beyond the elementary use of ordinary ladders for the purpose of vertically supporting a scaffold. Each such ladder is seen to comprise a pair of uprights 4 and 5 of preferably rectangular cross-section and provided with laterally extending footings 6 and 7, respectively, which provide increased lateral stability since they extend considerably beyond the projected intersection of the uprights with the ground. Footings 6 and 7 are suitably united to the uprights by bolts 8 for example, one of each of which also passes through an intermediate, diagonal wedge member 9 between the upright and footing to insure a more sturdy union of these parts.

Suitable members 10 of wood or metal having integral terminal connectors 11 bent angularly to form flanges overlying the sides of uprights 4 and 5 and permanently united thereto by rivets or bolts 12 serve as spacer rungs for the uprights and are placed near the lower ends of the latter at a point below the lowest operating level of the horizontal platform 3. It will be noted, however, particularly from Figure 2 that such flanged connectors 11 are spaced outwardly from the end surfaces of the vertical uprights 4 and 5 so that the platform assembly can, if desired, be lowered past these rungs through the clearance space provided. Also it may be found desirable in vertical scaffolds of increased height to provide spacer rungs 10 at intervals for the entire length of such uprights.

The horizontal platform 3 is composed of two series of inter-leaved, preferably rectangularly cross-sectioned and elongated members 13. Each series is composed of several of such members 13 spaced apart the width of each intervening member and is united rigidly to a pair of the uprights, 4, 5 by clamping means later to be described. At their terminal portions remote from such uprights each series is also united by one or more transversely extending steel strips 14 and 15, respectively. Any desired fastening means such as bolts 16 may be used to secure the elongated members 13 to their respective steel strips. From the foregoing it will be apparent that each series of individual members is moved toward the other as the pairs of uprights 4, 5 are moved toward each other providing a horizontal platform of constantly increasing, continuous central surface whose longitudinal extent depends on the spacing of the ladder members.

By uniting the horizontal stage 3 to the vertical supporting ladders 1, 2 I have provided unique clamping means which insures a secure and rigid connection of these parts while one that is readily adjustable to the requirements of the work. Attention is invited therefore to Figures 4 and 5 which show in perspective preferred forms of the component parts of such clamp. In Figure 4 it will be noted that clamp 17 includes a pair of generally triangular and horizontally disposed plates 18, 19 spaced one above the other for a distance corresponding to the vertical thickness of elongated members 13. Parallelism of plates 18, 19 is insured by a vertically extending web portion 20 joining the corresponding side legs of said triangular plates and a similar but shorter web portion 21 joining the end legs of said plates. Web portion 21 serves also as a supporting base for a pair of spaced, horizontally disposed jaw members 22 which are preferably united to said web portion by means of an integral base strip 23 welded thereto. For enabling the clamp 17 to be guided vertically on the upright 5 and rigidly united thereto at various elevations, a pair of vertically spaced collars 24 shaped to closely surround the rectangular sectioned upright except for a narrow central area of the outer face thereof for a purpose later to be described.

Collars 24 are vertically aligned as is readily apparent from the drawing and are thus maintained and also in fixed relation with the previously described portions of clamp 17 by means of a central web portion 25 disposed flatwise against web portion 20 and united thereto as by welding. Each web portion 20 is provided with an inwardly extending central tang 26 adapted to press into the side of the adjacent elongated member 13 to anchor the same. Furthermore, each web portion 25 is apertured at a point 25*a* disposed above the upper plate 18 to receive a locking pin or bolt 27 (Figure 1) which projects through a selected one of a series of vertically aligned apertures 28 in the upright 5 and may be secured therein by means such as wing nut 29, for example.

In Figure 5 there is shown a perspective view a clamp 35 designed specifically for cooperation with clamp 17 previously described to rigidly connect horizontal stage 3 and end ladders 1 and 2. Clamp 35 is generally the counterpart of clamp 17 and includes spaced, horizontal plates 36, 37 corresponding to plates 18, 19, web portions 38 and 39 corresponding to web portions 20 and 21, vertically spaced collars 40 united by a central web 42 and corresponding to collars 24 separated by the web 25. An aperture 25*b* is likewise provided in web portion 42 corresponding to aperture 25*a* of web portion 25. Instead of tang 26, however, the central portion of web 38 is bent inwardly at a right angle to serve as an abutment or stop for a short member 13*a* (Figure 1) which occupies the outermost position (nearest the observer, Figure 1). Also jaw members 44 corresponding to members 22 of Figure 4 are formed as symmetrical ears centrally apertured to receive a hinge pin 45 journalling an anchor bolt 46 therein. The inwardly extending apex portions 47 of plates 36, 37 are upwardly and downwardly offset where they overlie the corresponding portions of plates 18, 19 and each of

such plates is provided with a vertically aligned aperture 48 for receiving locking means such as a bolt 49 secured in place by a wing nut 50, for example (Figures 1–3).

It will be noted from Figures 1 to 3 that short members 13a, identical with that referred to in the preceding paragraph are arranged alternately with the elongated members 13 to constitute with the latter members in effect, a solid block which may be drawn together by tightening of the wing nut 46a to anchor bolt 46 through the washer 51, following which the bolt 49 may be inserted and wing nut 50 thereof, tightened.

It will be readily apparent that the clamp means just described for the ladder 1 is duplicated for the ladder 2. Also it will be clear from the foregoing that since the clamps are integral, rigid members, tightening of the fastening means thereof, i. e.: the wing nuts referred to, will insure an inherently rigid horizontal platform, vertical ladder assembly under all conditions of use and throughout all adjusted positions thereof.

In Figure 6 there is shown a form of clamp that is generally similar to the clamp depicted in Figure 4 and hereinbefore described with the difference that a tubular collar 53 suitably united to web portion 20 as by welding at 54 is substituted for the spaced collars 24 of the preferred form of the invention. Collar 53 is suitably apertured at 25a as has been previously described. For vertical ladders of tubular structural members it is advisable to provide rubber feet or cap members such as are indicated in dotted lines at 54 of Figure 6 to eliminate any possibility of marring floor surfaces when used interiorly as well as to insure against slippage.

In Figure 7 where is shown a modification of the preferred form of clamp permitting the use of ladder rungs 10a of usual type, that is, rungs that are wholly disposed within planes defined by the inner and outer surfaces of the vertical uprights. Such clamp differs from the Figure 4 construction in that the spaced collars 55 are disposed about the corresponding upright 5 as formerly but are rotated 180° from their former position before attachment as by welding at 56 to the web portion 20. For additional strength the collar portions nearest such web 20 are not separated but extend continuously from their upper extremity to the lower extremity thereof.

As will readily be apparent from the foregoing, my scaffold may comprise the assembly of vertical end members and horizontal platform as shown in Figure 1 or it may, if desired, be confined to such platform and a single vertical end member, an ordinary ladder suitably united to the opposite end of such platform completing the same. Also, it is obvious that the improved form of integral clamp shown and described in the foregoing permits the use of planking of various widths as the platform thereof.

I claim:

1. A clamp for securing a scaffold platform to a pair of vertically disposed scaffold upright supports comprising a pair of members, each of which includes collar means substantially entirely circling one of said upright supports and releasably secured thereto, superimposed vertically spaced plates secured to said collar means, a web member connecting said plates along an edge thereof, said web member engaging a side portion of said platform and said plates engaging upper and lower surface portions thereof immediately adjacent said side portion, means on one of said members arranged to overlie a portion of the other member, means extending through the plates of each of said members and through the scaffold platform for releasably securing said platform and clamp together, and means mounted for horizontal pivotal movement on one of said members releasably engageable with a portion of the other member whereby said web members may be drawn towards each other.

2. A clamp for securing a scaffold platform to a pair of vertically disposed scaffold upright supports comprising a pair of members, each of which includes vertically spaced collar means substantially entirely circling one of said upright supports and releasably secured thereto, superimposed vertically spaced plates secured to said collar means and vertically spaced from the encircling portions thereof, a web member connecting said plates along an edge thereof, said web member engaging a side portion of said platform and said plates engaging upper and lower surface portions thereof immediately adjacent said side portion, means on at least one of said web members arranged to penetrate said side portion of the platform, cooperating overlapping means on said plates including registerable apertures whereby bolt means may releasably secure the same in fixed position, and horizontally extending bolt means for drawing said web members towards each other.

PERCY GRAY.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
350,153	Petty	Oct. 5, 1886
405,195	Ayres	June 11, 1889
412,989	Sixsmith	Oct. 15, 1889
495,920	Strohm	Apr. 18, 1893
574,486	Jones	Jan. 5, 1897
714,761	Tilley	Dec. 2, 1902
1,129,218	Macklem	Feb. 23, 1915
1,218,144	White	Mar. 6, 1917
1,312,994	Leonard	Aug. 12, 1919
1,313,268	Cunningham	Aug. 19, 1919
1,352,188	Giles	Sept. 7, 1920
1,359,452	Walker	Nov. 16, 1920
1,825,590	Hollister	Sept. 29, 1931
2,300,018	Shuck	Oct. 27, 1942
2,335,046	Droeger	Nov. 23, 1943