Aug. 29, 1939. G. A. WORTELMANN 2,171,284

SCAFFOLD

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Fig. 1

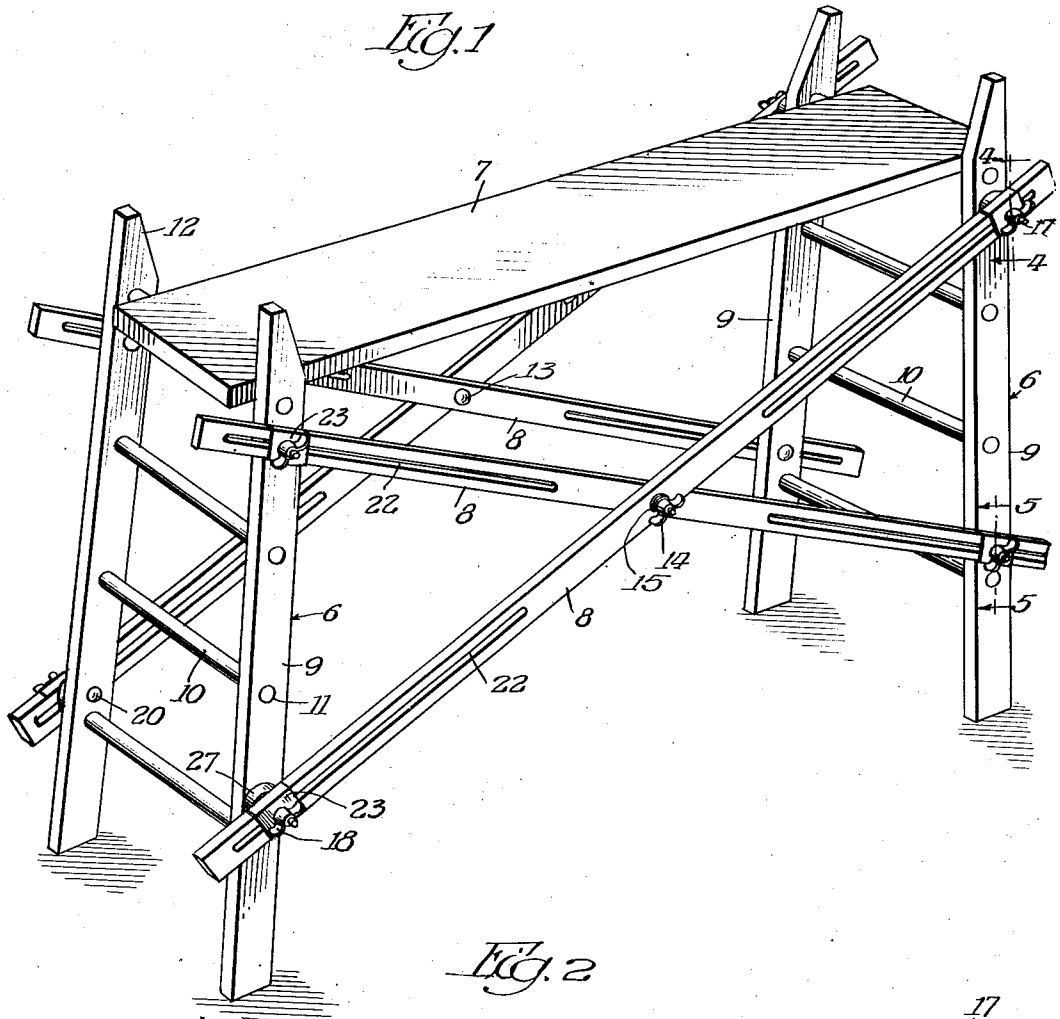
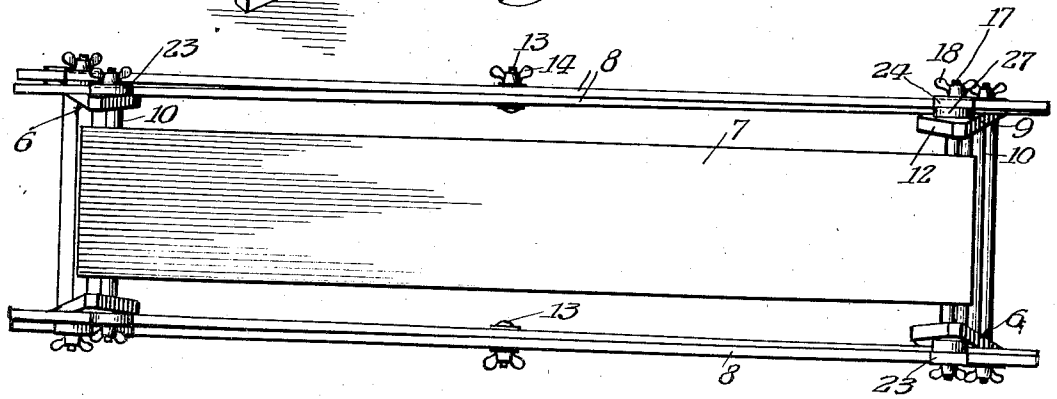


Fig. 2



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Fig. 3

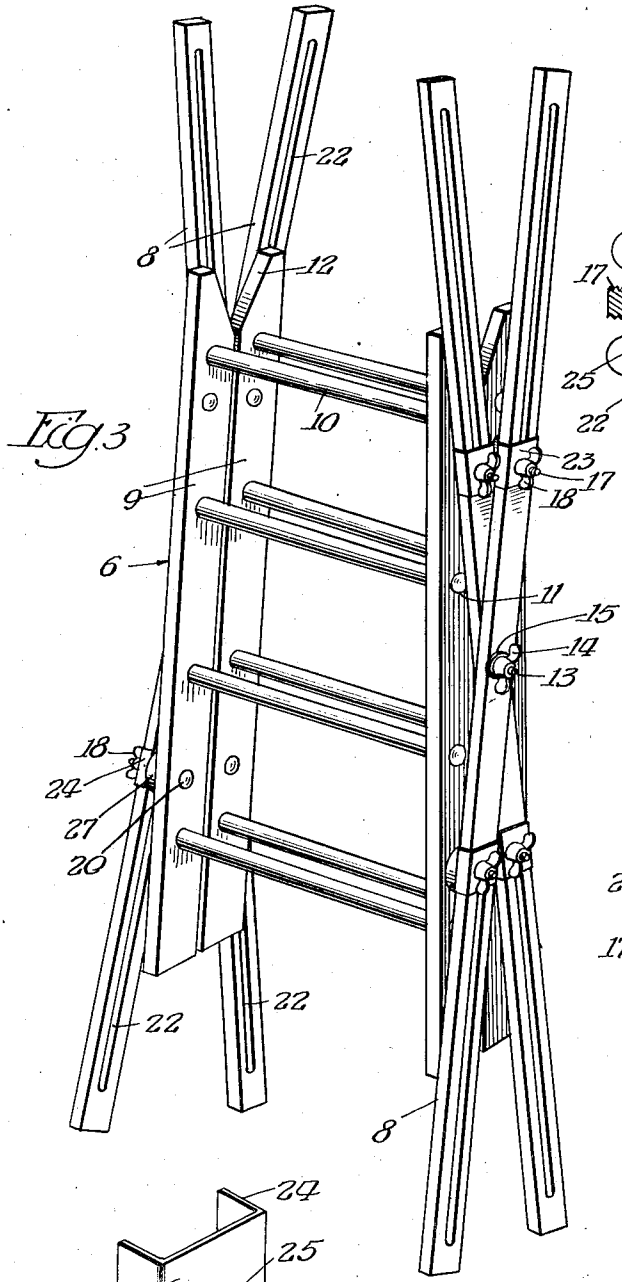


Fig. 4

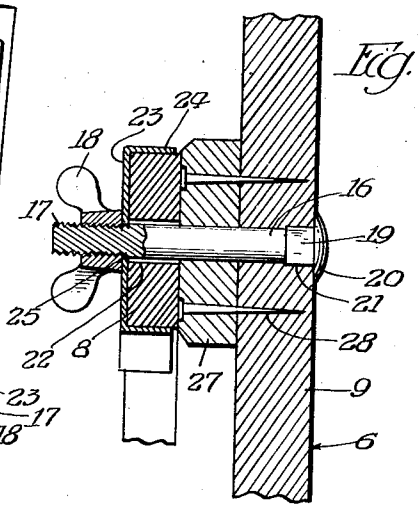


Fig. 5

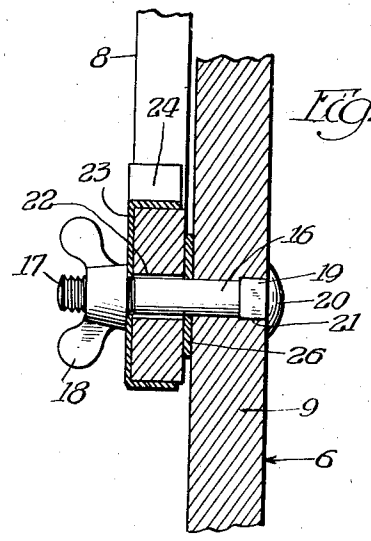
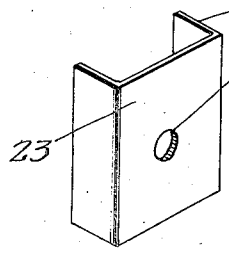


Fig. 6



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UNITED STATES PATENT OFFICE

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SCAFFOLD

Gustave A. Wortelmann, Chicago, Ill.

Application January 14, 1938, Serial No. 184,911

6 Claims. (Cl. 304—3)

The present invention relates generally to scaffolds. More particularly the invention relates to that type of scaffold which is adapted for use by workmen in connection with work on ceilings and walls and comprises a pair of upstanding ladders and a platform forming board between the ladders.

One object of the invention is to prpovide a scaffold of this type which is of new and improved construction and is so designed that it not only effectively and efficiently fulfills its intended purpose but also may be manufactured at a low and reasonable cost.

Another object of the invention is to provide a scaffold of the type under consideration which includes pairs of crossed braces which are located at the sides of the ladders and extend between and are connected at the ends thereof to the side pieces of the ladders.

A further object of the invention is to provide a scaffold of the last mentioned character in which the ends of the crossed braces are connected by bolt and slot connections to the side pieces of the ladders and are pivotally connected together at the points where they cross one another in order that upon loosening of the bolts the two ladders may be brought together into a collapsed position for purposes of transportation or storing.

A still further object of the invention is to provide a scaffold of the type and character under consideration in which the upper ends of the side pieces of the ladders are shaped to form handles for assisting the users of the scaffold in mounting or climbing onto the platform forming board.

Other objects of the invention and the various advantages and characteristics of the present scaffold will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by claims at the conclusion hereof.

In the drawings which accompany and form a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views:

Figure 1 is a perspective of a scaffold embodying the invention;

Figure 2 is a plan view;

Figure 3 is a perspective view showing the scaffold in its contracted or collapsed position;

Figure 4 is an enlarged sectional view taken on the line 4—4 of Figure 1 and illustrating the construction and design of the bolt and slot connections between the ends of the outer braces and the side pieces of the ladders;

Figure 5 is an enlarged sectional view taken on the line 5—5 of Figure 1 and showing the construction and design of the bolt and slot connections between the ends of the inner braces and the side pieces of the ladders; and

Figure 6 is a perspective of one of the flange equipped plates which are mounted on the bolts of the bolt and slot connections and serve to reinforce the slotted ends of the braces.

The scaffold which is shown in the drawings constitutes the preferred embodiment of the invention. It is adapted primarily for use in supporting workmen in an elevated position in connection with work on ceilings and walls and comprises as the main or essential parts thereof a pair of upstanding ladders 6, a platform forming board 7, and two pairs of crossed braces 8.

The ladders 6 are positioned one opposite to the other and serve to support the board 7 in a horizontal position. They are cross-connected and suitably strutted by the braces 8 and consist of elongated laterally spaced side pieces 9 and rungs 10 between the side pieces. The side pieces are all equal in height and are held in laterally spaced relation by the rungs 10. Preferably the side pieces of each ladder are upwardly convergent to a small extent so that the scaffold when in its operative or working position is stable and not likely to rock in a sidewise manner. Each of the ladders is preferably provided with four rungs 10 and the latter are round, as shown in the drawings, and have the ends thereof suitably secured in cylindrical sockets 11 in the side pieces 9. The upper and lower ends of the side pieces 9 project above and below the upper and lowermost rungs respectively. The upper ends of the ladder side pieces are so cut or shaped that they are tapered or pointed and form upstanding handles 12 above the board 7. These handles may be grasped by the users of the scaffold in connection with mounting the board 7 from the ladders and serve to hold the board against sidewise displacement when it is mounted on and supported by the uppermost rungs 10. The rungs are equidistantly spaced and not only serve as supporting means for the board but also provide a step arrangement by which the users of the scaffold may climb to or mount the board.

The board 7 is adapted to rest on any of the horizontally aligned pairs of ladder rungs 10. It forms or constitutes the platform of the scaffold and may be arranged at whatever level or eleva-

tion is desired merely by adjusting its position with respect to the rungs. When the board is in its operative position with the ends thereof resting on a pair of horizontally aligned rungs it is held against lateral displacement with respect to the ladders by the side pieces 9. The length of the board is preferably slightly greater than the distance between the lowermost rungs of the ladders when the ladders are in their full operative or extended position.

The braces 8 serve to hold the ladders in their operative position and are formed of wood or like light material. At the points of crossing the braces are pivotally connected together by way of a pair of bolts 13. These bolts are fixed to and project outwardly from the inner braces and project through holes (not shown) in the adjacent or contiguous portions of the outer braces. The outer ends of the bolts are provided with wing nuts 14 which bear against washers 15 on the outer ends of the bolts and operate when tightened to clamp the inner and outer braces together and hold them against relative pivotal movement with respect to the bolts. The ends of the braces are connected to the ends of the side pieces 9 of the ladders 6 by way of bolts 16. These bolts are carried by and project outwardly from said side pieces 6 and have threaded outer ends 17 on which wing nuts 18 are mounted. The inner ends of the bolts are provided with polygonal enlargements 19 and enlarged dome-like heads 20. The enlargements 19 fit within correspondingly shaped polygonal sockets 21 in the side pieces of the ladders and serve to hold the bolts against rotation. The heads 20 abut against the inner side faces of the ladder side pieces and prevent outward movement of the bolts with respect to such side pieces. The central portions of the bolts project through longitudinally extending slots 22 in the ends of the braces and carry U-shaped plates 23. The slots 22 project outwardly from the central portions of the braces and terminate inwardly of the end extremities of the braces. They are slightly greater in width than the bolts are in diameter and when the nuts 18 are loosened permit the ladders 6 to be shifted bodily inwards into a collapsed position wherein they abut against one another, as shown in Figure 3. The plates 23 are in the form of metal stampings and have inturned top and bottom flanges 24. They fit against the outer side faces of the braces 8 and provide bearings for the nuts 18. When the latter are tightened the plates 23 are urged inwards and serve in conjunction with the nuts to hold the braces in fixed relation with the bolts 16. The central portion of the plates embody holes 25 for the bolts 16. These holes are substantially the same in diameter as the bolts with the result that the plates are limited to pivotal movement with respect to the bolts and cannot move laterally or radially with respect to the bolts. The top and bottom flanges 24 fit against the top and bottom faces of the braces respectively and serve to prevent outward spreading of the portions of the braces at the sides of the slots 22. When the wing nuts 18 are loosened and the ladders are shifted together into their collapsed or inoperative position, the ends of the braces ride or slide within the flanges of the plates 23. The holes 25 are so arranged that the bolts 16 are spaced from the sides of the slots 22 and hence there is no likelihood of any wedging or jamming action being encountered in connection with collapse of the ladders. The threads on the outer ends of the bolts preferably terminate adjacent to the plates 23 in order that they do not damage in any way the sides of the slots 22 in the event that such sides are brought into engagement with the bolts. The inner ends of the slots 22 terminate at such distance from the bolts 13 that the ladders are free to be shifted together, as shown in Figure 3. When the ladders are in their collapsed position the lower ends of the braces 8 form a stand for supporting the ladders in an upright position. The inner braces are spaced from the outer side faces of the ladder side pieces 9 by way of washers 26 and the outer braces are spaced from said side pieces by way of wooden collars 27. The latter are secured in place by means of nails 28, as shown in Figure 4, and are equal in thickness to the combined thickness of the washers 26 and the ends of the inner braces.

When the scaffold is in its collapsed position and it is desired to place it in condition for use, the operator or user loosens the wing nuts 14 at the sides of the ladders and then spreads the ladders apart until the bolts 16 are brought substantially to the outer ends of the slots 22. During outward shift of the ladders 6 the braces 8 rotate about the bolts 13 and swing from their ladder supporting position into the position shown in Figure 1. After separation of the two ladders the wing nuts 14 and 18 are tightened. Upon tightening of these nuts the braces 8 become clamped together and in fixed relation with the ends of the side pieces 9 of the ladders and serve fixedly and rigidly to hold the ladders in their spaced position. After spreading of the ladders and tightening of the nuts the platform forming board 7 is applied to any desired horizontal pair of rungs 10 so that it extends horizontally and fulfills its intended purpose. When it is desired to mount the scaffold the user may use either of the two ladders. When it is desired to store or transport the scaffold, it is only necessary to remove the board 7 and then after loosening the nuts 14 and 18 shift the two ladders together, as hereinbefore described. Upon shift of the ladders together the nuts 14 are tightened so as to clamp the braces together and hold the ladders in place.

The herein described scaffold consists of but a comparatively small number of parts and may be manufactured at a low and reasonable cost. When formed of wood it is comparatively light and may be readily transported from one place to another when in its collapsed position.

The invention is not to be understood as restricted to the details set forth since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

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

1. A collapsible scaffold comprising in combination a pair of opposed ladders adapted when the scaffold is in its operative position to stand substantially vertically and in spaced relation, a platform forming board adapted to extend horizontally between the ladders and to have the ends thereof rest on the rungs of the ladders, a pair of crossed braces extending between the ends of certain of the side pieces of the ladders and having a pivot for the crossed central portions thereof, connections in the form of nut equipped bolts on the ends of said certain side pieces of the ladders and longitudinal bolt receiving slots in the ends of the braces, adapted normally to

connect the braces to the ladders so that the former hold the latter in their operative position and upon loosening of the nuts to permit the ladders and braces to be shifted together into an inoperative or collapsed position, and readily releasable clamping means applied to the pivot and operative to clamp together in fixed relation said central portions of the braces and hold them in place when the ladders are in their operative or inoperative position.

2. A collapsible scaffold comprising in combination a pair of opposed ladders adapted when the scaffold is in its operative position to stand substantially vertically and in spaced relation, a platform forming board adapted to extend horizontally between the ladders and to have the ends thereof rest on the rungs of the ladders, a pair of crossed braces extending between the ends of certain of the side pieces of the ladders and having a pivot bolt extending through the crossed central portions thereof, connections in the form of nut equipped bolts on the ends of said certain side pieces of the ladders and longitudinal bolt receiving slots in the ends of the braces, adapted normally to connect the braces to the ladders so that the former hold the latter in their operative position and upon loosening of the nuts to permit the ladders and braces to be shifted together into an inoperative or collapsed position, and a wing nut on the pivot bolt operative to clamp together in fixed relation said central portions of the braces and hold the braces in place when the ladders are in their operative or inoperative position.

3. A collapsible scaffold comprising in combination a pair of opposed similarly formed rung equipped ladders adapted when the scaffold is in its operative position to stand substantially vertically and in spaced relation, a platform forming board adapted to extend horizontally between the ladders and to have the ends thereof rest on any two opposed rungs of the ladders, pairs of crossed braces at the sides of the ladders extending between the ends of the side pieces of the ladders and having the crossed central portions thereof pivotally connected together, and connections in the form of nut equipped bolts on the ends of said side pieces and longitudinal bolt receiving slots in each of the ends of the braces, adapted normally to connect the braces to the ladders so that the former hold the latter in their operative position and upon loosening of the nuts to permit the ladders and braces to be shifted together into an inoperative or collapsed position.

4. A collapsible scaffold comprising in combination a pair of opposed ladders adapted when the scaffold is in its operative position to stand substantially vertically and in spaced relation, a platform forming board adapted to extend horizontally between the ladders and to have the ends thereof rest on the rungs of the latter, a pair of crossed braces extending between the ends of certain of the side pieces of the ladders and having the crossed central portions thereof pivotally connected together, connections in the form of nut equipped bolts on the ends of said certain side pieces of the ladders and longitudinal bolt receiving slots in the ends of the braces, adapted normally to connect the braces to the ladders so that the former hold the latter in their operative position and upon loosening of the nuts to permit the ladders and braces to be shifted together into an inoperative or collapsed position, and plates on the bolts provided with right angle flanges engaging slidably the portions of the braces at the sides of the slots and serving to prevent outward displacement of said portions.

5. A collapsible scaffold comprising in combination a pair of opposed ladders adapted when the scaffold is in its operative position to stand substantially vertically and in spaced relation, a platform forming board adapted to extend horizontally between the ladders and to have the ends thereof rest on the rungs of the latter, a pair of crossed braces extending between the ends of certain of the side pieces of the ladders and having the crossed central portions thereof pivotally connected together, connections in the form of nut equipped bolts on the ends of said certain side pieces of the ladders and longitudinal bolt receiving slots in the ends of the braces, adapted normally to connect the braces to the ladders so that the former hold the latter in their operative position and upon loosening of the nuts to permit the ladders and braces to be shifted together into an inoperative or collapsed position, and metallic plates mounted on the bolts between the nuts and the braces and having inturned flanges engaging slidably the portions of the braces at the sides of the slots and serving to prevent outward displacement of such portions.

6. A collapsible scaffold comprising in combination a pair of opposed ladders adapted when the scaffold is in its operative position to stand substantially vertically and in spaced relation and consisting of a vertical series of rungs and elongated side pieces connected to the ends of the rungs and having the upper ends thereof projecting above the uppermost rungs and shaped to form handles, a platform forming board adapted to extend horizontally between the ladders and to have the ends thereof rest on the uppermost rungs and fit between the handles, pairs of crossed braces at the sides of the ladders extending between the ends of the side pieces of the ladders and having the crossed central portions thereof pivotally connected together, and connections in the form of nut equipped bolts on the ends of said side pieces and longitudinal bolt receiving slots on the ends of the braces, adapted normally to connect the braces to the ladders so that the former hold the latter in their operative position and upon loosening of the nuts to permit the ladders and braces to be shifted together into an inoperative or collapsed position.

GUSTAVE A. WORTELMANN.