March 4, 1947. W. A. POHRMAN 2,416,950

PORTABLE SCAFFOLDING

Filed Jan. 28, 1946 2 Sheets-Sheet 1

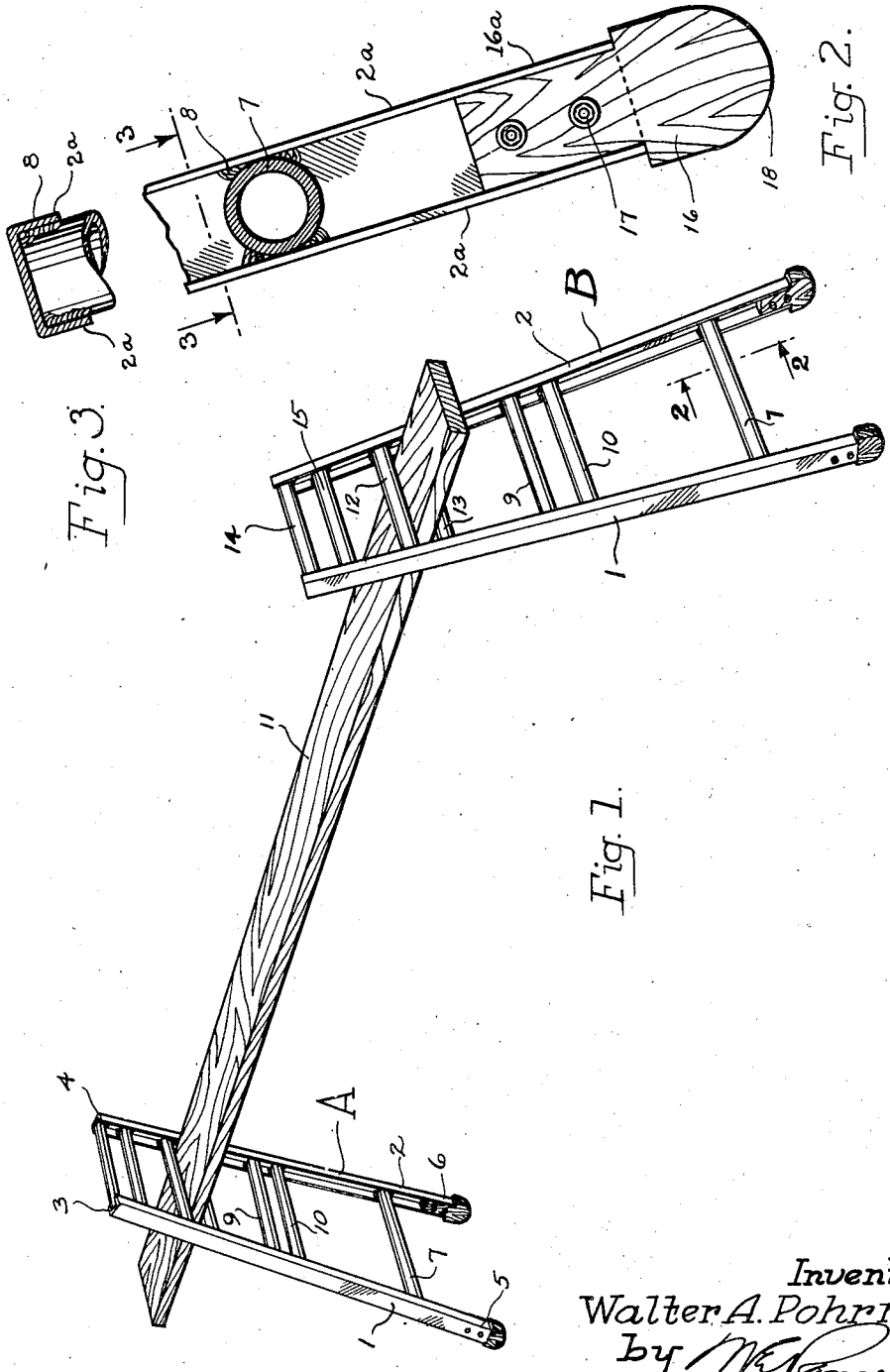


Fig. 1.

Fig. 2.

Fig. 3.

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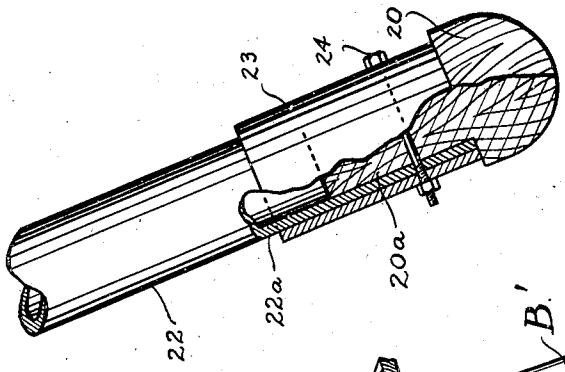


Fig. 5.

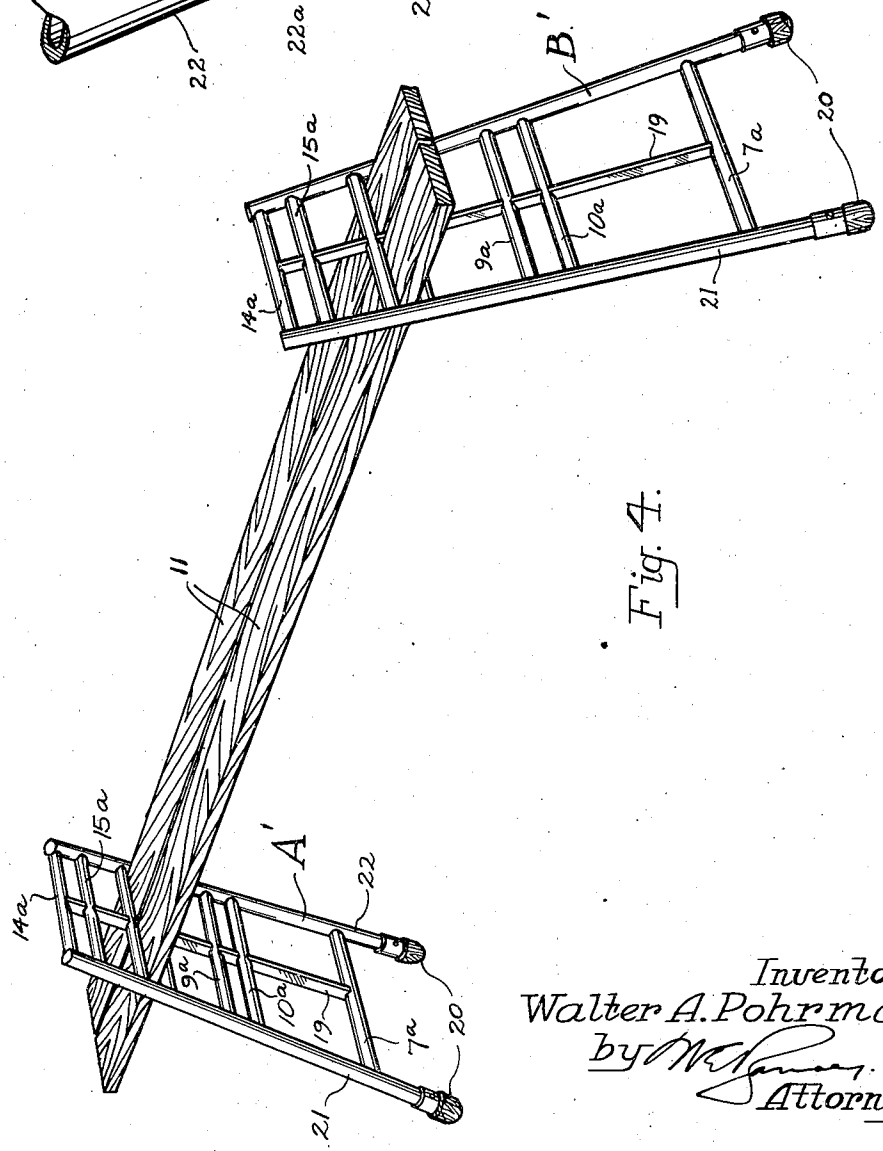


Fig. 4.

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PORTABLE SCAFFOLDING

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5 Claims. (Cl. 304—3)

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The object of my invention is to provide a scaffold of the ladder-type which has its greatest use in shipbuilding, within houses and other areas which require a scaffold to be passed through narrow openings and to be quickly and easily assembled and disassembled. The object of my invention is to provide a scaffold of this type of two ladder sections and one or more boards or scaffold planks which extend between the ladder sections and constitute a platform. The arrangement of the rungs of the ladder sections, their spacing and disposition cause the parts to so engage each other that they serve to prop and give rigidity to the scaffold without requiring auxiliary fastening devices or other supports.

A further and more specific object of my invention is to provide a ladder structure of this character which may be used in connection with the construction of a portable scaffold, which ladder structure is strong and rigid and securely grips and holds platforms to promote stability in a portable scaffold.

The details of my invention and the mode of operation thereof are hereinafter described with reference to the accompanying drawings in which:

Fig. 1 is a perspective view of a scaffold constructed in accordance with my invention;

Fig. 2 is an enlarged sectional view of the bottom portion of a ladder, said section being taken on the line 2—2 in Fig. 1;

Fig. 3 is a fragmentary sectional detail taken on a line 3—3 in Fig. 2;

Fig. 4 is a perspective view of a modification of my invention in which a plurality of planks or boards may be supported by the two ladder sections; and

Fig. 5 is a sectional detail of a modified type of foot for a ladder element, portions of said structure being shown broken away to disclose details of construction.

A portable scaffold embodying my invention comprises two ladder sections and a joining platform or scaffolding board. The ladder sections are identical and are thus interchangeable. In the drawings the left hand ladder section is given reference character A and the righthand section is B. Because of the fact that said sections are identical the same reference characters are given to the parts thereof.

Said ladder sections comprise two uprights 1 and 2 and said uprights preferably are structural channel sections or are U-shaped in cross-section. This is not essential but it is desirable because

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the legs of said U-shaped sections may straddle the rungs and be welded thereto, as will hereinafter be described. Said uprights preferably converge toward their upper ends 3 and 4 and are spaced more widely at their lower ends 5 and 6. This tends to promote lateral stability and is common in ladders.

A plurality of rungs are joined between said uprights. In Fig. 2 the lower rung 7 is illustrated and it is to be noted that said rung is welded between the spaced U-shaped portions 2a of the upright 2 so as to be securely joined. It is to be understood that both ends of each rung are welded in place within the straddling portions of the uprights. Said rungs 7, 9, 10, 12, 13, 14, and 15 are of the same diameter which closely approximates the spacing of the lateral flanges of the two uprights 1 and 2. As is shown in Fig. 2 this fit is quite snug and thus if welds are made at both sides of the pipe and inside of each of said flanges 2a the welds form virtually cradles in which said rungs lie. That is, fillet welds may be made at both sides of each rung and at each end thereof which secure said rungs within the U-shaped structure of the uprights at the ends and along both sides of the rung adjacent said ends. Said fillet welds form virtually wedges inclined substantially tangential to the periphery of the rung and thus a secure structure is formed.

At convenient heights in said ladders, pairs of rungs are arranged as pairs 9 and 10, 12 and 13, and 14 and 15. Said pairs are spaced apart a distance only slightly greater than the thickness of the scaffold plank or platform 11. That is, said pairs of rungs will easily accomodate said cross plank or platform when the ladder sections are parallel but when the ladder sections are moved so that their lower ends 5 and 6 are spaced apart more widely, the said board or platform 11 is pinched between and gripped by the pairs of rungs between which it lies. The location of said spaced pairs above the lower ends 5 and 6 defines the vertical height of the scaffolding plank 11 and three pairs of rungs are sufficient, for example, in taking care of all needs for scaffolding in a room having a normal wall and ceiling height.

The scaffolding plank 11 is shown located between the pairs of rungs 12 and 13. If it is desired to move said scaffolding plank to a higher location it would be arranged between the rungs 14 and 15 and if it were desired to lower the scaffolding plank it might be supported by the rung 10 and be gripped upon its upper surface by the other rung 9 of said pair.

To prevent the lower ends 5 and 6 of the ladder sections from slipping it is desirable that they be provided with feet 16 made of hardwood or other non-metallic substance providing good frictional engagement with a floor, and without marking or scarring said floor. Said feet are joined to the uprights 1 and 2 by bolts 17. The lower or extreme end is preferably rounded at 18 so that it may seat securely independent of the angular relation of the ladder sections. Said feet have a narrowed neck 16*a* which lies closely within the lateral marginal flanges 2*a* of the upright. It is desirable that this fit should be almost a driving fit so as to eliminate play.

In many instances it is desirable and necessary to comply with state or industry safety regulations to provide a platform two planks wide. To comply with said regulations and to provide a broader platform I make ladder sections A^1—B^1 adapted to accommodate two scaffolding planks 11 arranged side by side, as is shown in Fig. 4.

In said figure I also have illustrated how said ladder sections may be made of tubular members 21 and 22 with the rungs 7*a*, 9*a* and 10*a*, 12*a* and 13*a*, and 14*a* and 15*a* welded thereto. To provide two laterally aligned but separated pockets between each of said pairs of rungs I arranged a longitudinally arranged stiffening and partitioning member 19 equi-distant between uprights 21 and 22. This member 19 prevents the scaffolding planks from shifting laterally and also stiffens the ladder section so that it will not bow, nor the rungs bend due to the greater width of the ladder provided to accommodate two scaffolding planks, side-by-side. To fit the tubular form of the uprights of the ladders I make feet 20 of hardwood or similar material so that the outside diameter of the neck portion 20*a* thereof will fit tightly within the bore 22*a* of the upright 22. An encircling clamping band 23 extends about the periphery of the lower end of said upright 22 and a transverse bolt 24 extends diametrically through the collar 23, the lower end 22*a* of the upright 22 and the neck 20*a* of said foot to hold said parts tightly together and prevent lateral movement and inadvertent disengagement of said parts.

My improved portable scaffold may be used as follows: In shipbuilding, for example, and particularly between decks it is necessary to paint or otherwise work upon walls and ceilings which are out of reach of a workman standing on the floor or deck. Scaffolding must be brought aboard and this either may be in the form of planks or in the form of horses or other constructed parts. If the latter, the rough handling incident to swinging in slings or crowding them through narrow passageways promotes extensive breakage. If said scaffolding is partially preformed, as horses, and similar parts, then said structure is also quite bulky. With my type of portable scaffold the scaffolding planks and the ladder sections may be laid flatwise one upon the other and be carried in sling-loads as conveniently as lumber, timbers or structural steel members. To set up said scaffolding it is necessary only to select two ladder sections and pass the ends of one or more scaffolding planks between appropriate height rungs of said sections, move said ladder sections so that their feet or bottom portions diverge outwardly until they pinch and engage the ends of the scaffolding. With this simple operation, the scaffolding is fully complete and is sturdy. Taking down may be performed in a similar expeditious manner. The ladder sections are merely arranged parallel and then may be spread apart and pulled off the ends of the scaffolding planks.

Although I have discussed the use of my invention in connection with shipbuilding and ship construction I do not want to consider its use limited thereto or imply that this is the field of its greatest use. Said portable scaffolding provides an extremely efficient and sturdy support in houses and buildings for painters, plasterers and other workmen and because of the fact that said parts are all flat and easily detached they may pass easily through doorways and other restricted apertures. I deem it desirable but not essential that the ladder sections be made of metal and that the scaffolding planks be made of wood. There is substantial strain resisted by the ladder sections and said strain is translated into pinching stresses on the end of the scaffolding plank or planks. Said pinching serves to bind the parts together and to prevent inadvertent displacement or disengagement. The spacing of the rungs should not exceed the thickness of the planks substantially because it is undesirable that the ladder sections diverge to too great a degree. If they extend at substantial oblique angles with vertical they impose too great bending stresses upon the ladder sections. Insufficient angularity of the ladder sections promotes instability. Thus, I have shown in Figs. 1 and 4 the arrangement of the parts in suggested angular position to minimize destructive strains and to promote adequate stability.

I claim:

1. In a scaffold comprising a pair of ladder sections and a scaffold board supported between them, each ladder section having uprights and pairs of rungs joining said uprights and spaced in longitudinal alinement and at longitudinal intervals between said uprights, said rungs being adapted to receive and support said scaffold board between them and said pairs of rungs being spaced apart a distance only slightly greater than the thickness of said scaffold board so that when said ladders are inclined obliquely to said scaffold board they will pinch and hold such scaffold board securely without requiring auxiliary fastening devices.

2. In a scaffold comprising a pair of ladder sections and a scaffold board supported between them, each ladder section having uprights and pairs of rungs joining said uprights and spaced in longitudinal alinement and at longitudinal intervals between said uprights, said rungs being adapted to receive and support said scaffold board between them, said pairs of rungs being spaced apart a distance only slightly greater than the thickness of said scaffold board so that when said ladders are inclined obliquely to said scaffold board they will pinch and hold such scaffold board securely without requiring auxiliary fastening devices, and said rungs being of circular section, thus presenting curved surfaces to the faces of said scaffold board.

3. In a scaffold comprising a pair of ladder sections and a scaffold board supported between them, each ladder section having uprights and pairs of rungs of circular section joining said uprights and spaced at longitudinal intervals between said uprights, said rungs being adapted to receive and support said scaffold board between them, said pairs of rungs being spaced apart a distance only slightly greater than the thickness of said scaffold board so that when said ladders are inclined obliquely to said scaffold board they

will pinch and hold such scaffold board securely without requiring auxiliary fastening devices, and said uprights being of U-shaped section, the lateral walls thereof being spaced apart a distance substantially equal to the diameter of said rungs, said rungs being secured between said lateral flanges.

4. In a scaffold comprising a pair of ladder sections and a scaffold board supported between them, each ladder section having uprights and pairs of rungs of circular section joining said uprights and spaced at longitudinal intervals between said uprights, said rungs being adapted to receive and support said scaffold board between them, said pairs of rungs being spaced apart a distance only slightly greater than the thickness of said scaffold board so that when said ladders are inclined obliquely to said scaffold board they will pinch and hold such scaffold board securely without requiring auxiliary fastening devices, and said uprights being of U-shaped section, the lateral walls thereof being spaced apart a distance substantially equal to the diameter of said rungs, said rungs being welded between said lateral flanges.

5. In a scaffold comprising a pair of ladder sections and a scaffold board supported between them, each ladder section having uprights and pairs of rungs joining said uprights and spaced at longitudinal intervals between said uprights,

said rungs being adapted to receive and support said scaffold board between them, said pairs of rungs being spaced apart a distance only slightly greater than the thickness of said scaffold board so that when said ladders are inclined obliquely to said scaffold board they will pinch and hold such scaffold board securely without requiring auxiliary fastening devices, said uprights being of U-shaped section, the lateral walls thereof being spaced apart a distance substantially equal to the diameter of said rungs, said rungs being secured between said lateral flanged and separable feet recessed in the lower ends of said U-shaped uprights, the floor engaging surfaces of such feet being curved to accommodate changes in the angular relation of the ladder sections with respect to each other and to said scaffold board.

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