

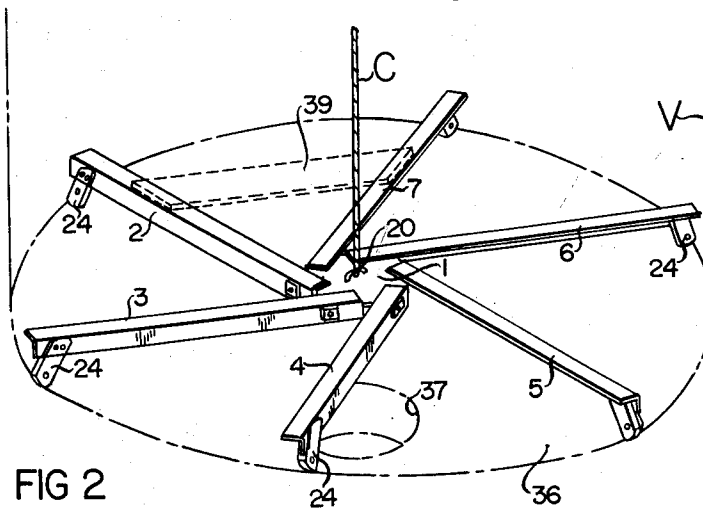
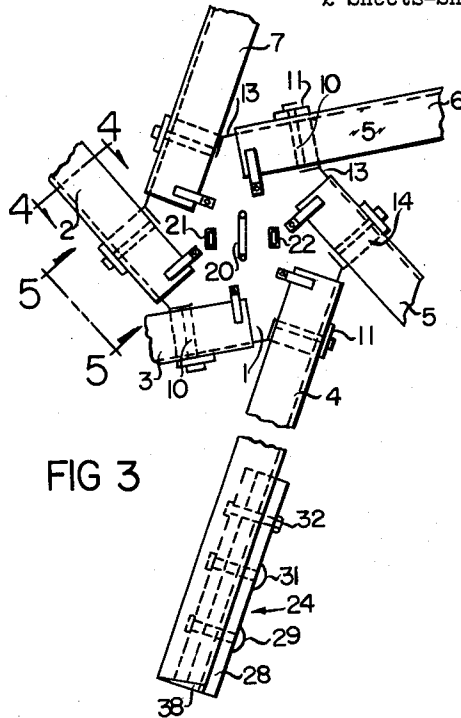
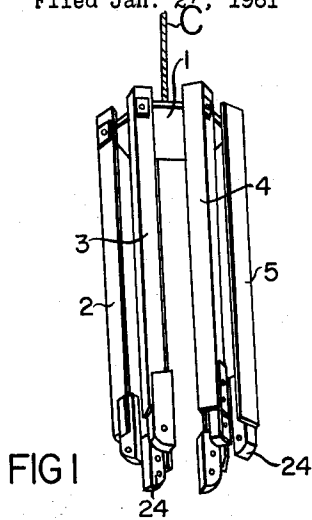
March 12, 1963

N. C. FULLER
COLLAPSIBLE SCAFFOLD

3,080,941

Filed Jan. 27, 1961

2 Sheets-Sheet 1



INVENTOR.

NORMAN C. FULLER
BY

Oberlin, Maky & Donnelly
ATTORNEYS

March 12, 1963

N. C. FULLER
COLLAPSIBLE SCAFFOLD

3,080,941

Filed Jan. 27, 1961

2 Sheets-Sheet 2

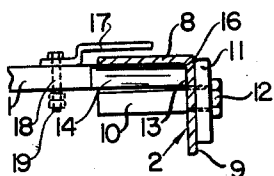


FIG 4

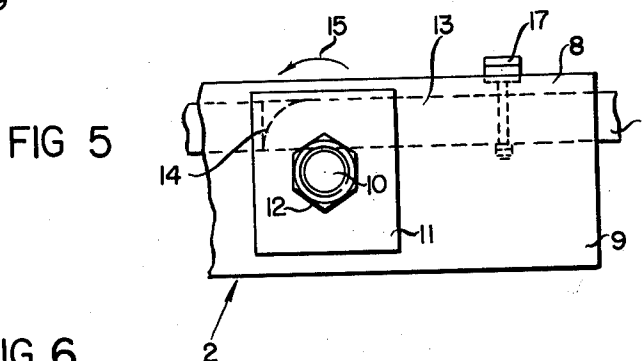


FIG 5

FIG 6

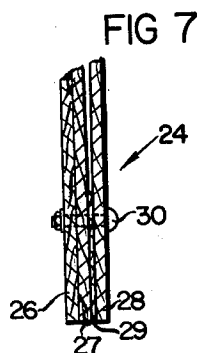
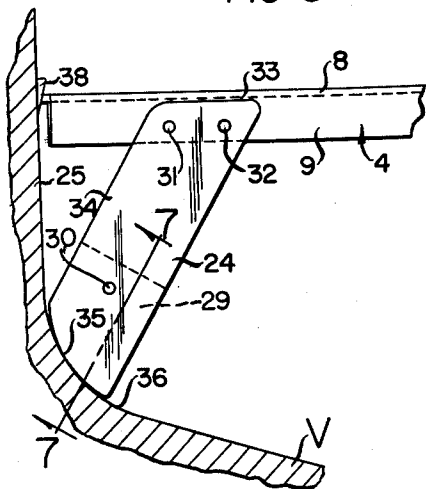


FIG 7

INVENTOR.

NORMAN C. FULLER
BY

Oberlin Maky & Donnelly
ATTORNEYS

1

3,080,941

COLLAPSIBLE SCAFFOLD

Norman C. Fuller, Brecksville, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio, a corporation of Ohio

Filed Jan. 27, 1961, Ser. No. 85,418

1 Claim. (Cl. 182-152)

This invention relates, as indicated, to a collapsible scaffold and more particularly to a framing assembly for use in the interior of vessels and the like.

It is an arduous and time consuming task to erect proper working platforms and supports in the interior of a vessel, such as a reactor, having only a relatively small access opening on the order of a manhole. In order to erect a working platform therewithin, the component parts of such a platform or scaffold must be inserted piecemeal into the vessel and the platform then constructed therefrom. When the maintenance or repair work is completed, the platform must then be disassembled and the parts individually removed through the limited access opening, components made of wood being generally employed for the purpose and the task being quite laborious particularly when working in cramped quarters. In some cases, damage to the interior of the vessel may accidentally be caused in carrying out the job.

It is accordingly a principal object of my invention to provide a collapsible scaffold frame for use in the interior of a vessel or other closed space having a limited access opening which can easily be inserted in, erected and removed from such working space.

It is yet another object of my invention to provide such a collapsible scaffold which is of relatively light weight, for ease of handling, and yet sufficiently rigid and strong when in operative condition to support heavy loads thereon.

Other objects and advantages of the present invention will become apparent as the following description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features herein-after fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail a certain illustrative embodiment of the invention, this being indicative, however, of but one of the various ways in which the principles of the invention may be employed.

In said annexed drawings:

FIG. 1 is a perspective view of my new scaffold in its collapsed condition preparatory to insertion within a vertically extending reaction vessel or the like;

FIG. 2 is a fragmentary perspective view illustrating the scaffold in its extended condition within such vessel;

FIG. 3 is a fragmentary top plan view of certain details of the scaffold construction;

FIG. 4 is a fragmentary sectional view taken generally on the line 4-4 of FIG. 3;

FIG. 5 is a fragmentary view as seen from the plane of line 5-5 of FIG. 3;

FIG. 6 is a fragmentary sectional view illustrating the leg detail of my collapsible scaffold engaging the wall of the reaction vessel; and

FIG. 7 is a fragmentary sectional view taken generally on the line 7-7 of FIG. 6.

Referring now to the drawing and more particularly to FIGS. 1 and 2 thereof, my collapsible scaffold comprises a center supporting plate 1 and a plurality of legs or beams 2, 3, 4, 5, 6 and 7 pivotally affixed thereto. As shown more clearly in FIG. 4, each of the legs comprises an angle structural metal member having, with the leg extended, a horizontally extending top flange 8 and a ver-

2

tically extending side flange 9. Welded or otherwise rigidly fastened to the under side of plate 1 are horizontally pins 10 projecting respectively through the vertically extending flanges 9 of the several legs. A flat rectangular exterior plate 11 is secured to each such pin by a nut 12 threaded thereon. The pins are secured directly beneath the plate 1 to project outwardly therefrom normal to straight and angularly related edge portions 13 of the plate, it being noted that these edge portions are equally spaced about the plate. Between each pair of edge portions 13, the plate edge has portions 14 at right angles to one such portion 13 of the pair.

As can be more clearly seen in FIG. 5, each such plate edge portion 14 is rounded. Accordingly, the legs are pivotally attached to the plate 1 readily to permit them to pivot between depending vertical and horizontal positions. It will be noted, however, that my construction precludes any pivoting of a leg upwardly beyond horizontal, since the top flange 8 of the leg abuts the top of the plate 1. The exterior plate 11 may be welded directly to the leg to provide a reenforced bearing surface for the nut 12 threaded on the end of pin or rod 10. Thus, a reenforced pivot is provided for each of the legs on the plate 1. Swivel catches 17 are provided pivoted on pins or bolts 18 secured to the plate 1 by jam nuts 19 and movable to overlie the flanges 8 of the legs when horizontally positioned to preclude the same from pivoting about the pins 10 to their vertical positions.

It can now be seen that after the legs are opened to the horizontal position shown in FIG. 3, the nuts 12 may firmly be tightened to secure or lock the legs in a horizontal co-planar condition. In the center of the plate, there is provided a semi-circular lifting lug 20 and two sockets or recesses 21 and 22. The sockets may be formed by welding suitable barstock to form recesses for a manhole ladder or the like extending upwardly from the center of such plate. Accordingly, the entire apparatus may be lifted or lowered by a suitable mechanism such as a winch, crane or the like attached to the scaffold as by a cable or rope C at the semi-circular lifting lug 20.

Referring to FIGS. 2, 3 and 6, it will be seen that each of the legs is provided with a wooden foot 24 to assist in supporting the outer end of the leg by engagement with the vessel, the feet 24 being made of several pieces of wood firmly held together. As shown, four such plywood pieces are here utilized to form the outer tip of each foot, the boards or pieces 26, 27 and 28 being of the same thickness. Interposed between the boards 27 and 28 is a further thinner board 29 of a slightly larger thickness than the thickness of the depending flange 9 of the leg, the pieces being glued and carriage bolt 30 being passed transversely therethrough. Accordingly, it will be seen that the boards 27 and 28 are spaced by the filler 29 a sufficient distance to straddle the depending flange 9 of the associated leg. A bolt 31 is employed to provide a suitable pivot pin for the foot 24 and a locking pin 32 is used to fix and support the foot in its extended angular position with respect to the leg.

It is noted that the tops of the boards 26, 27 and 28 are cut as shown at 33 such that the boards 26 and 27 will abut against the underside of horizontally extending flange 8 of the leg or beam. This will further serve to hold the foot in the position shown in FIG. 6. The top corner of the foot is also rounded so that the foot is free to pivot about the pin 31 from the position shown in FIG. 6 to the position shown in FIG. 1 wherein the side 34 of the foot will be abutting the underside of the flange 8. In this position, the end of the depending flange 9 will be snugly fitted between the boards 27 and 28. As illustrated in FIG. 6, the tip of the foot is rounded as shown at 35 readily to conform to the rounded portion of the

3

bottom 36 of the vessel V. It can now be seen that the outer end of the legs, all of the detailed construction set forth, will firmly be supported by their feet 24 resting against the rounded bottom portion of the vessel. In order further to secure the scaffold rigidly within the vessel, a wooden wedge 38 (FIG. 6) may be employed between each leg end and the vessel wall.

Planks or other support members are placed across the adjacent legs as shown at 39 to form a working platform above the bottom head of the vessel. In taller vessels, further scaffolding or ladders may be erected from this platform for work on the upper parts of the vessel. The assembly could also be supported by a cable through the top manhole of the vessel and thus held at any particular height in the vessel with the feet 24 wedging against the sides of the vessel and further wedges 38 properly centering and holding the scaffold with respect thereto.

In operation, it may readily be seen that the scaffold collapsed to the condition shown in FIG. 1, with the legs and feet pendently hanging from the plate 1, can readily be inserted through the usual top manhole. Within the vessel, each of the legs 2 through 7 inclusive is raised by the worker utilizing a wrench or the like to tighten the nuts 12 and the swivel catches 17 are moved over the flanges 8. When the legs are raised to the horizontal position, it can be seen that without the locking pins 32, the feet 24 will automatically pivot to the positions shown in FIG. 6. The pins 32 are inserted to lock the feet properly in place, and the wedges 38 are inserted to take up any peripheral slack that may be found between the vessel lining and the legs. It is noted that the feet 24 always extend radially beyond the legs even in their inclined position as shown in FIG. 6. Since it will be evident that only the wooden feet 24 and the wooden wedges 38 contact the lining of the vessel, the metallic parts of my

4

scaffold which may be steel or aluminum, for example, will not contact a lining for the vessel, thus reducing the possibility of damage thereto. After the legs are firmly positioned in the manner shown in FIG. 2, planks 39 or the like may readily be inserted through the manhole to form the working platform in the vessel.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims or the equivalent of such be employed.

I, therefore, particularly point out and distinctly claim as my invention:

A collapsible scaffold comprising a central scaffold supporting plate, a plurality of supporting beams pivoted thereabout for swinging movement between a collapsed downwardly extending position parallel to each other generally normal to said plate and an extended horizontal position generally coplanar with said plate, and a foot pivotally attached to each beam near the free end thereof for supporting such beam when extended, said beams having stop flanges at their proximal ends which engage the top of the plate when the beams are horizontal and thus limit the upward swinging of the beams.

References Cited in the file of this patent

UNITED STATES PATENTS

860,808	Keegan	July 23, 1907
1,263,216	Everitt	Apr. 16, 1918
1,380,074	Myers	May 31, 1921
1,631,848	Yager	June 7, 1927
1,652,403	Gerdeman	Dec. 13, 1927

FOREIGN PATENTS

520,747	Great Britain	May 2, 1940
65,393	Norway	Oct. 26, 1942